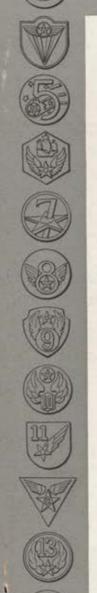


AIR FORCE



THE MAGAZINE OF AMERICAN AIRPOWER

August 1956 • 35c







Tenth Anniversary Issue



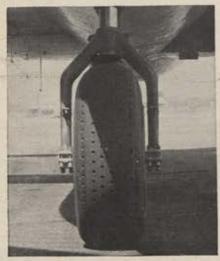
LOCKHEED'S F-104A Starfighter, latest supersonic Air Force fighter, is only one of more than 40 turbine-powered aircraft currently equipped with products built by Hamilton Standard. Superior engineering, research, development, and experience stand behind Hamilton Standard's leadership in production for outstanding aircraft—jet or propeller driven.

WHEREVER MAN FLIES



B.F. Goodrich

offers six ways to trim weight, reduce costs, improve maintenance



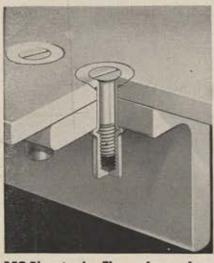
Tubeless to save weight, dimpled for more landings—B. F. Goodrich Tubeless Tires mean greater payloads—120 pounds for one airline. Save time and money in warehousing by eliminating the tube. The BFG Dimpled tread wears slower, more evenly, gives more landings before recapping.



Lands big ones safely—BFG wheels, load-rated 60,000 lbs., give maximum strength with minimum weight on Boeing's B-47. What's more, this wheel stood up under test loads of 300,000 lbs.! B-47's dual wheel assemblies are equipped with B. F. Goodrich brakes.



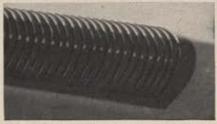
B.F. Goodrich brakes stop Northwest's new 1049-Gs smoothly, give long maintenance with more even wear. When fluid pressure is introduced, a full circle "tube" lifts each brake block evenly around the full circle of the drum. The entire braking surface is utilized.



BFG Rivnuts give Tiger a longer leap Grumman engineers form integral wing tanks of F11F-1 Tiger with top and bottom aluminum wing sections fastened together by new B. F. Goodrich Seal-Head Rivnuts—only one-piece blind fastener with threads. Fuel-tight Rivnut is approved for primary structures.



Heated girdle gives life-saving hug B. F. Goodrich electrically heated rubber is one of the most efficient ways of applying spot heat. It's light, flexible, has many applications. Here it fits snugly over oil valve to maintain vital flow of lubricating oil despite low temperatures.



B.F.Goodrich De-Icers break the ice faster—Chordwise pneumatic De-Icers on Lockheed Super Connies have smaller tubes, electronic controls, quick-snap inflation cycles. For more information on these and other products, write: Aeronautical Sales, B. F. Goodrich Tire and Equipment Company, a Division of The B. F. Goodrich Company, Akron, Obio.



AVIATION PRODUCTS Tires, wheels, brakes • De-Icers • Inflatable seals • Fuel cells • Avtrim • Heated Rubber • Pressure Sealing Zippers • Rivnuts • Plastilock adhesives • Hose and rubber accessories

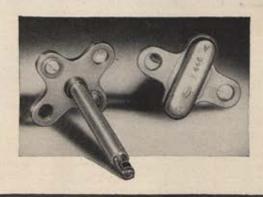
Announcing...

FENWAL'S NEW JET ENGINE HARNESS AND INTERCHANGEABLE THERMOCOUPLES, PROVIDING

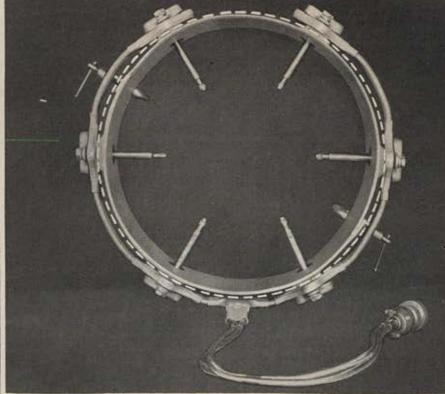
- Operation at temperatures over 1200°F
- Foolproof installation, simplest maintenance

A NEW CONCEPT IN TERMINALIZATION

Fenwal's new concept of Button Terminalization for integrated assembly of thermocouples and harness allows a new ease of installation. Only two bolts — and buttons make firm, reliable electrical contact! It can actually be installed in 15 minutes by a mechanic who has never seen it before. All the thermocouples are offset — and can only be installed in one way. And should a thermocouple go bad all you have to do is remove two bolts and insert another thermocouple. And that's a great advantage in maintenance.

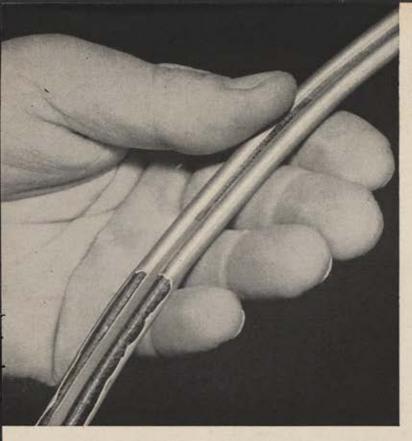






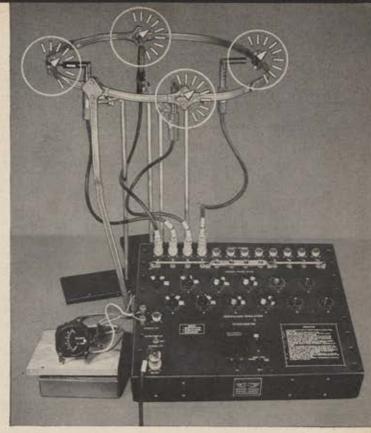
DIFFERENTIAL EXPANSION NO PROBLEM

Fenwal's new Button Terminalized harness is rigid, yet flexible enough so that differential expansion will not cause difficulties. It is so designed that even when bolted in place the harness is flexible enough so that no great stresses are placed upon the thermocouple bosses or mounting bosses for the harness. That means holding brackets do not have to be "beefed up" in order to withstand large forces due to differential expansion.



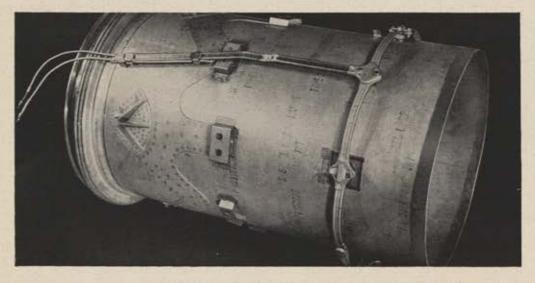
SOLID STAINLESS STEEL CASING PROTECTS WIRES

Even the wires on the Fenwal harness are encased in an insulatedblanket and inserted in a stainless steel covering. This prevents the wire from becoming frayed and unraveled during installation or from vibration while in use.



BALANCED RESISTANCE HARNESS

The resistance path from each thermocouple to the indicator is equal, minimizing undesired circulating currents and enabling maximum accuracy.





ENGINE TEMPERATURE INDICATION AND/OR CONTROL

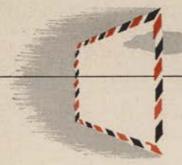


WRITE FOR ALL THE FACTS

Fenwal's new concept of integrated harness and thermocouples may be of great service to you. Write for complete data now, to Fenwal Inc., Aviation Products Division, 348 Pleasant Street, Ashland, Mass. Fenwal's new Button Terminalized thermocouple and harness assembly is ideal for indicating temperature. It is also used for control because of the great reliability of the Fenwal thermocouple. In fact, Fenwal thermocouples and harnesses can be used on any size gas turbine aircraft engine. They will withstand ambient temperatures over 1200°F.



Controls Temperature ... Precisely



air mail

Too Much Wasted Time

Gentlemen: I have just finished reading the July issue of your magazine and find it enjoyable, interesting, and a credit to aviation.

I have read the article "Solving the Roles and Missions Muddle" thoroughly, and have given it careful consideration. The question of whether the Strategic Air Command does or doesn't need the United States Navy is a vital one which should be settled immediately. If there is an opening in the Strategic Air Command, let's have the Weapons Systems Evaluation Group take a look at it and find out what is missing in our defenses. If this opening is in our airpower we should have more aircraft in production, for the Air Defense Command and the Strategic Air Command, to fill it. It appears to be in our capability to hit enemy targets no matter where they are. If this is so, mass production of aircraft capable of long range and of carrying atomic weapons should be undertaken. The Navy's aircraft carriers may come close to many of the enemies' homelands, as they did in World War II, and launch their aircraft within striking range of enemy targets, but they have many more disadvantages than advantages. They can come in contact with mines, submarines, enemy aircraft, guided missiles, and others. If we can put into production aircraft that can meet the requirements of range and weapons, they would have fighter escorts for protection from interception. We have many superior aircraft capable of escort missions, such as the Republic F-84F Thunderstreak, the Lockheed F-104A Starfighter, the Convair F-102A, and the McDonnell F-101 Voodoo. If there is an opening to be filled, let's fill it by more aircraft production for the AF, or, if found sufficient, US Navy aircraft carriers.

It is my sincere desire to see this issue settled. We are wasting valuable time arguing, and the Russian defense force isn't standing still.

L. J. Long Washington, D.C.

Fair Approach

Gentlemen: Congratulations to Mr. Gill Robb Wilson on his very pointed editorial "The Roles and Missions Muddle," [July '56]. At a time when many persons have seemingly lost all reason in attempts to boost their individual services, Mr. Wilson's moderate approach is effective because of its shocking fairness.

May I suggest that as a stimulant to further reading you review articles on aviation, unification, and the Air Force appearing in other magazines. Recently Life, Collier's, The Reporter, and U.S. News and World Report have run articles. Many significant articles are missed because they are not brought to the attention of interested persons.

T/Sgt. David M. Ingalls Washington, D.C.

Still Footloose and Fancy Free

Gentlemen: I have already given my attorney the go-ahead on a libel suit against Air Force Magazine for the statement published in the July issue about my marital status. It is hurting my "amateur" standing and interfering with some healthy, happy occupations that I am most fond of. After all these years of dodging marriage traps, I am suddenly wedded by a slip of the pen. Seriously, I have heard much comment and enjoyed some good laughs about it.

Morry Worshill Chicago, Ill.

"Oh, Them . . . Slippers"

Gentlemen: While reading the print right off the pages of the July Air Force Magazine, which is SOP with such a fine publication, I was interested to note the photograph of 1st Lt. Ada J. Monahan Boarding an F-94 ["The Ready Room,"] prior to leaping off into the wild blue yonder.

The high heels look real pretty but it seems that they wouldn't be of much help walking home if our pretty nurse had to hit the silk and find out the hard way that nothing beats a pair of gunboats when it comes to flying.

My congratulations to the entire editorial staff for doing a tremendous job of bringing The Good Word to all of us each month.

> Arnold R. Tefft Davisville, R. I.

Speak of the Devil . . .

Gentlemen: A "double take" is in order on a "Wing Tips" item [June '56]:

"Six years of scheduled helicopter service in the United States and Europe have been completed without a single passenger fatality. According to the Civil Aeronautics Board, there has never been a fatal accident due to engine failure in any kind of civilian helicopter operation."

This is a statistic neatly fitting Jerry Lederer's simile:

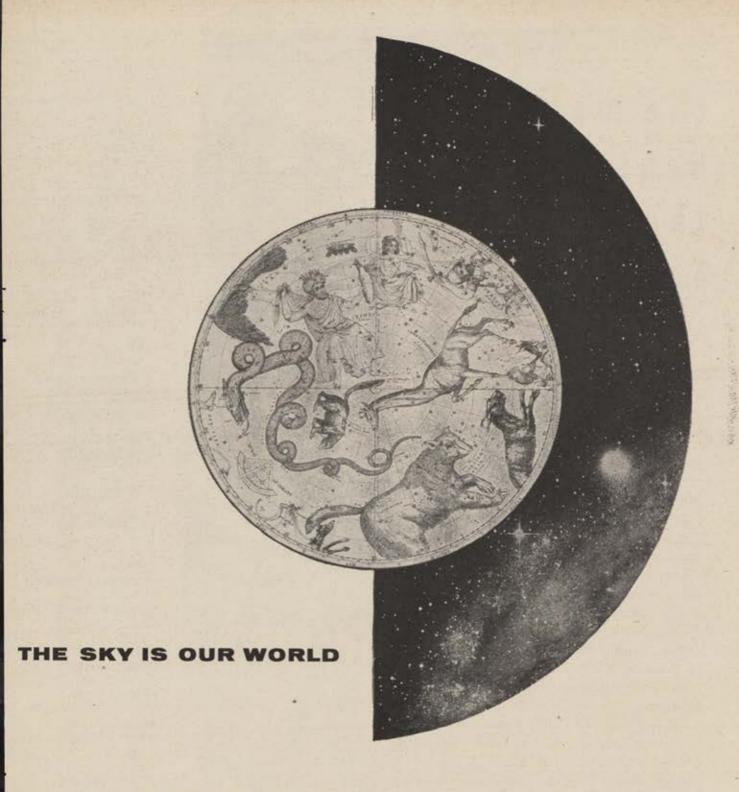
A statistic is often like a bikini. What it shows is interesting, but what it hides is vital."

The first sentence of the quote loses much value when one considers that passengers have been carried by "scheduled helicopter service" for only about two years.

The second sentence speaks of fatalities from engine failure in civilian helicopter operation. Without investigation, one guesses that those aloft in obsolete fixed-wing aircraft often fared as well, vis-à-vis the same limited danger, for equal periods in days of yore.

Most birdmen believe in witches, talismen, rabbits' feet, et al, and in-(Continued on page 7)

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CONTINUED

evitably when the rules of witchcraft are trespassed, evil results. An elementary rule is never to mention good luck out loud. No sooner did the illadvised "Wing Tip" get sent to your galleys than rumor has it a British scheduled passenger-carrying helicopter crashed in London with fatal results!

It was difficult for me to write this because, as I still make regular ascensions, perforce, I usually keep the fingers of my right hand perpetually crossed whilst incessantly knocking on wood with my clenched left.

Col. Alfred L. Wolf, USAFRes. Philadelphia, Penna.

'Tiny Grains of Sand . . .'

Gentlemen: Like many other ROTC graduates last summer, I entered the Air Force with a mixture of pride and expectancy. I had my college degree, a commission, a wife who was proud of me, a sense of duty; and perhaps most important of all, I was entertaining the thought of making a career 3. Moved ahead with plans for its out of the Air Force.

That was last summer. Now, after ten months of the Air Training Command, I feel that I'd rather sell apples on a street corner than stay in.

Why? I may have an answer that the Air Force has overlooked.

As college graduates, we can realize and appreciate the tremendous major problems the Air Force must cope with. But it is the dozens of little petty annoyances, so minute, that occur every day, day after day, that drive us to distraction. Major problems can be solved-they are easily recognizable. But these petty annoyances, brought on by mismanagement, inefficiency, and duplication, actually become too much to put up with. Sound silly? Believe me, it's not.

Lieutenant

Letter to A. Godfrey

Gentlemen: Thanks so much for the AIR FORCE Magazine reprint of April '56, and I am glad to rejoin the Association for the current year. Some years have elapsed since I was last a member.

In the matter of bombing aviation, I feel that I am one of the lucky ones, a survivor of the 96th Squadron, the first American bombing squadron. We, the pilots and observers and crews, trained at Clermont-Ferrand in France. The pilots and observers were teamed up and sent up to the front in April 1918, and the crews worked on our old training planes, Breguet bombers, built at Clermont-Ferrand, with Renault motors, and the planes were

a letter from TO: VICTORIA D'AVI

Dearest Vicki:

You don't know it, but dangling near the windshield of my plane is a tiny shoe you wore as a baby, to remind me I'm the daddy of a gorgeous little girl-and to soothe my eyes after seeing my own big flat dogs beneath the panel. You've grown up but, thank gosh, all your

expansion has been in the right places, and your tootsies still are neat and trim. Men prefer ladies with small, shapely feet, especially when displayed by an auburn-haired, brown-eyed Someone who's 18, 5'4%", and 114 lbs.

Now. SAC has: 1. Opened a Mid-West Division in Kansas City, Kans., to ditribute and service the products of the Eclipse Pioneer, Red Bank, Pioneer Central. Utica, and Pacific divisions of the Bendix Aviation Corp., and of the AC Spark Plug Division of GM, the Aeroquip Corp., and B. F. Goodrich Co.;

station-is 25 years old but, unlike

you, it has NEVER stopped growing.

Southwest Airmotive-my favorite service

2. Opened a Rocky Mountain Division at Denver, Colo., as distributor for the Bendix Products and Bendix Pacific divisions, AC. Goodrich, and Aeroquip, and

new \$2,000,000 service and parts distribution facility at Love Field, Dallas.

Yesmam, faith in the future is identified by Major Investments in the past and present. This always has been the case with Southwest Airmotive. Come to think of it, this also is true in the case of me and my Queen Victoria. I consider the faith of both of usme and SAC-extremely well placed!

Daddy

SOUTHWEST AIRMOTIVE CO.

LOVE FIELD

flown up to the front, and we started with them, as our flying equipment in June 1918. Once during that summer we were down to one plane.

We were the only American squadron to use Breguets, and the succeed-ing squadrons had Liberty planes, American de Havillands.

As an observer (bombing) of the 96th, I feel that we were lucky to be in at the start of American bombing. Our total casualties in dead, wounded, and prisoners were 105 percent, but none of our missions turned back after they were once over the lines.

I wrote to Secretary Quarles, USAF,

that while I did not know exactly the production rate of the B-52, I felt that it was not being stepped up fast enough to handle our world-wide organization of Air Force bases, as well as our world commitments.

Ralph I. Corvell Farmington, Mich.

We Need More Like Him

Gentlemen: I noted in one of the recent issues of Am Force Magazine that you commented about the excellent relations of one base commander with the community, Col. Benjamin

(Continued on page 10)





TECHNOLOGICAL



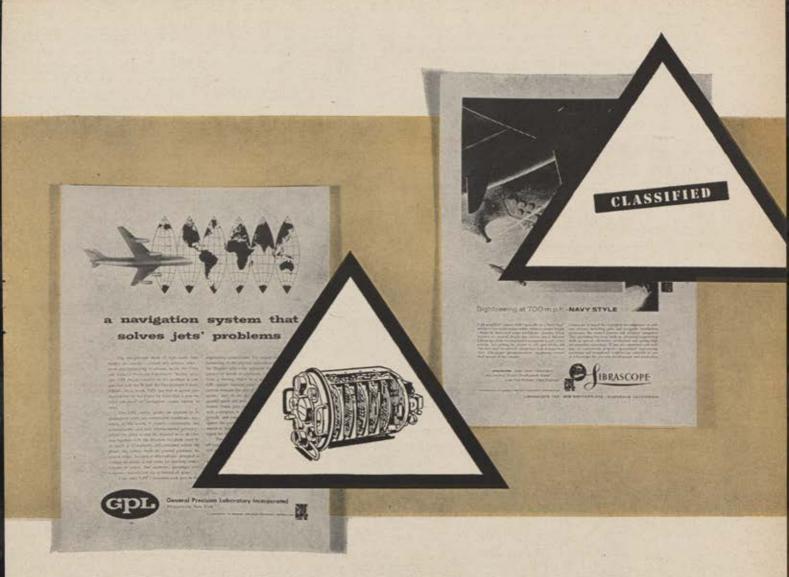
AERONAUTICAL SYSTEMS

have made vital contributions to the progress of jet aviation and its expansion into the civil transport field. Many have won recognition as the finest in the industry, bench marks of American technology.

Whole generations of airmen, for instance, have been trained in flight simulators developed and produced by Link, pioneer of on-the-ground flight training. This GPE Company has delivered over 800 jet flight simulators—more than all other manufacturers put together. It has just been selected, on the basis of superior technology and equipment, to produce America's first simulators for jet air liners. Link-developed DC Computer Systems in Link supersonic simulators are the only ones meeting the needs of these advanced aircraft.

Equally dominant are the gyro-magnetic compass systems of Kearfott, another GPE Company. This company's new lightweight J-4 Compass System weighs only

GENERAL PRECISION



BENCH MARKS

18 pounds. Yet it provides accurate heading information at all latitudes, is rugged enough to maintain its high accuracy despite the jolts and speeds of jet flight. The Air Force has just selected it as standard for all new fighter craft. Kearfott's N-1 Compass System has been the navigational standard for Air Force bombers for 5 years.

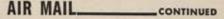
Still another member of the GPE Group, General Precision Laboratory, has developed and is currently making quantity deliveries of the most advanced airborne navigation systems in use. These GPL systems, which are self-contained and fully automatic, have flown millions of operational miles with unprecedented accuracy. Their adaptations to civilian jet needs—GPL's RADAN Systems—are expected to make equally far reaching contributions to the commercial jet transport field—in the way of increased safety, fuel economy, passenger convenience and efficient use of limited air space.

These are but some of the accomplishments in avia-

tion for which GPE Companies, working in conjunction with the Armed Services, are responsible. Librascope, an important member of the Group, produces outstanding instruments and equipment for the field. Librascope's computers, its highly advanced equipment for photoreconnaissance work and photogrammetric equipment for the interpretation of photo data, its periscopes, pilot and navigator finders, are all leaders. Several GPE Companies are deeply involved in inertial guidance, guided missile projects and certain nuclear power applications.

In all GPE achievements in the numerous industries in which the companies work, GPE Coordinated Precision Technology plays an important part by inter-relating the wide range of skills and resources of the Group. This operating policy, and each company's unremitting insistence on highest quality, are major reasons for the frequency with which GPE systems and equipment continue to set standards in their fields.

EQUIPMENT CORPORATION



Shiffrin, Base Commander of Griffiss Air Force Base, has received a certificate of appreciation from the Rome Chamber of Commerce and from the Common Council of the City of Rome commending him for his excellent work in community relations with the City of Rome. Colonel Shiffrin is scheduled to depart Griffiss Air Force Base in the very near future for an overseas assignment. I believe in giving credit where credit is due and suggest that you give Colonel Shriffin the credit he deserves.

Lt. Col. Robert J. Thompson Griffiss AFB, N. Y.

wonK dluohS eH

Gentlemen: I note [Am Force, June '56, page 47] in your article on the Air Defense Command that "plotters must learn to write in reverse." For what it may be worth to those charged with the hiring or training of personnel for this work, reverse writing is an ability that comes almost without effort to many left-handed persons.

William E. Martin Los Angeles, Calif.

 Mr. Martin must be good and lefthanded—we had to hold his reversewritten letter up to a mirror to read it.—The Editors

Pleased Participant

Gentlemen: I'm very glad that our company is participating as an Industrial Associate of your fine organization. I want you to know that I think AIR FORCE is one of the best publications I have had the good fortune to read. It is very informative and well prepared.

James L. Gaylord Lytle Engineering & Mfg. Co. Santa Monica, Calif.

Airport Museum

Gentlemen: In reply to a query by Mr. Cy Caldwell in the June issue as to how the average Smithsonian visitor could be induced to go to historic College Park, Md., to visit the proposed Air Museum—one suggestion which seems quite feasible is that a small portion of the Air Museum for the average visitors be kept at the main Museum. The bulk of the Museum containing the more technical exhibits of interest to the aviation—minded could be placed at the College Park Airport, appropriately adjacent to the University of Maryland.

By continuing to keep the airport itself active, visitors could also fly in by plane to see the Air Museum.

F. T. McHugh Baltimore, Md.



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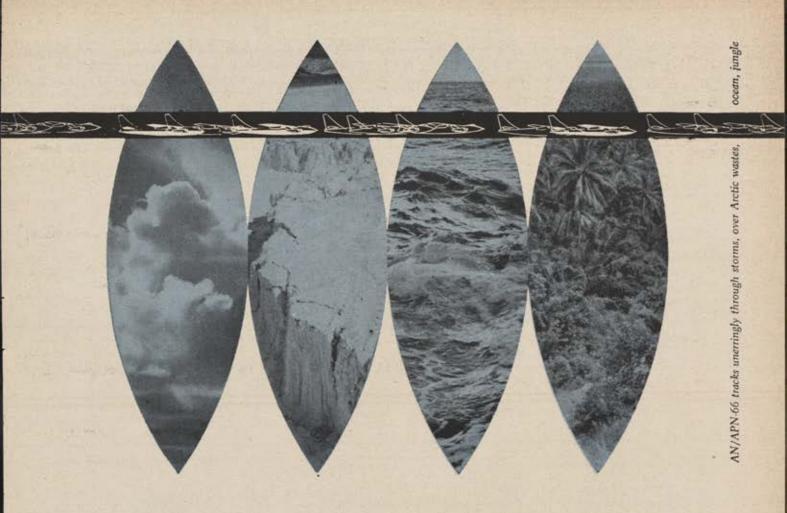


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The military application of a system of such capabilities is far reaching. To achieve these capabilities, GPL mobilized scientific manpower and facilities on a large scale. Four other GPE companies took part. Even so, development of AN/APN-66 took 8 years, for it required a seemingly impossible engineering achievement: the harnessing of the "Doppler effect."

The Doppler effect is the shift in the frequency of waves, sound or electrical, transmitted from a moving object to a stationary one. It is most familiar as the shift in the pitch of a train whistle as it approaches and passes. AN/APN-66 measures a similar shift in the frequency of electro-magnetic waves it bounces off the earth's surface below. From the difference in frequency between the original wave and its echo, the system computes the plane's speed and direction, then uses this data to keep continual track of the plane's position.

AN/APN-66 and its variations, AN/APN-81, 82 and 89, have flown millions of operational miles in transports, hurricane hunters, patrol craft, bombers. They are steadily going into more types of aircraft as standard equipment. When put to civilian use, they will guide air liners to the remote corners of the world.

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One out of every three miles traveled on domestic airlines in 1955 was coach traffic. Coach traffic increased twenty-five percent over the previous year, and totaled as much as all airline passenger traffic in 1949.

The helicopter is a much nicknamed flying machine—"whirly-bird," "chopper," "hoppy-copters." But leave it to the French to come up with a new one. A recent shipment of twenty-five Sikorsky H-19s to France was called elephant joyeux—happy elephants.

Italy's new lightplane, the Aeroscooter, will cost about \$1,300 in production quantities of 100. The two-seater version will feature a small helicopter-type rotor on top of the cabin, driven by a bottle of compressed air, to permit emergency landings.

A US Navy weather balloon, filled with helium and forty feet in diameter, has crossed the Pacific from Japan to the Oregon coast in less than fifty-two hours.

The ultra-modern new terminal building at the St. Louis Municipal Airport is designed to keep the passengers cool while they wait. There is also a pastel-colored nursery, an amusement room for teenagers, and underground pipes for air-conditioning parked planes.

Chicago's Midway Airport was still the busiest in the country in 1955. Excluding purely local operations, the five airports with the largest volume of civil and military operations were Chicago, New York's LaGuardia, Washington, Los Angeles, and Dallas.

Modern advertising concerns are spending a lot of time airing other people's business. In 1954 aircraft flew 11,000 hours towing signs, 2,400 hours dropping leaflets, 1,900 hours operating airborne loudspeakers, 1,400 hours skywriting, and 1,000 hours displaying neon signs.

US airlines in 1955 carried twenty-four percent more express ton-miles than in 1954, nineteen percent more freight ton-miles, and eighteen percent more passengermiles.

The Big Four among US scheduled air freight carriers are American, PAA, Slick, and Flying Tiger, in that order. The next four are United, TWA, Eastern, and Riddle. Together they account for over eighty percent of all freight ton-miles moving by air on US scheduled airlines.

The cost of operating an airliner for one mile averages fifty cents for a DC-3, ninety-eight cents for a DC-6, and \$1.20 for a DC-7.

0 0

It took 1.1 billion gallons of aviation gasoline to carry the airlines to their 1955 traffic record. Local service carriers, helicopter lines, and territorial airlines had no passenger losses during 1955. US international air fatalities totaled only two among 3,400,000 persons carried. The domestic airlines accounted for 156 of the total of 158 fatalities on US carriers during the year.

The first western commercial airliner service to Moscow has been initiated by Scandinavian Airlines. SAS flights to Russia will connect with transatlantic service from New York and transpolar service from Los Angeles.

Airplanes flew 17,000,000 miles in 1954 just looking for trouble. Their job was patrolling pipe lines, power lines, and telephone wires.

The new United Air Lines hangar at New York International Airport has four acres of roof and enough space to check six DC-7s and four DC-6s at one time.

Half of every airline dollar is spent for ground and indirect expenses at the airport, and for sales and other administrative expense. The other half goes for aircraft operation: thirty cents to fly the plane, twelve cents to maintain it, and eight cents for depreciation.

In 1955 there were fourteen local service airlines operating between small cities or from small city to principal centers. The largest revenue producers were Allegheny, Frontier, North Central, and Piedmont.

After a Denver motorist drove his car onto a runway



and through the propeller of a parked airliner, he was fined \$200 in traffic court.

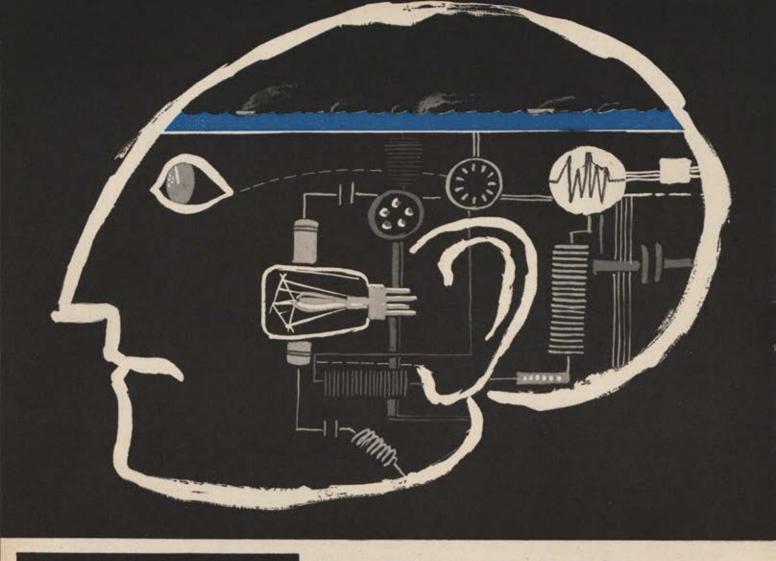
The big five in transatlantic traffic are Pan American, Trans-World, British Overseas, Royal Dutch, and Scandinavian Airlines. The two American lines carry fortyeight percent of the traffic. The other fifty-two percent is shared by eleven foreign flag carriers.

A few inveterate airline passengers account for a disproportionately high share of airline business. Four percent of the air travelers using New York airports average 100 or more flights each year. They account for twenty-four percent of all New York air trips. Twelve percent of the passengers, with a flying average of fifty hops a year, make up half the skyriding population.

Last year TWA accounted for more coach travel than any other airline. TWA was the only carrier with more than half its volume of business on coach flights.

The number of US air taxi operators totals 1,589, of which fifty are in Alaska.—End





A sophisticated weapon

The Fairchild Petrel

Deadly accurate ... exceptionally reliable

Bombers armed with the new Fairchild Petrel missile can release the deadly "birds" well outside the protective wall of shipboard AA. Petrel thinks for itself... seeks out its victim and strikes with uncanny accuracy.

"Petrel performs with a degree of relia-

bility exceptional for such a sophisticated weapon", the Navy says.

Petrel has been fully operational for some time. It is a masterwork of advanced electronics and daring design . . . another major contribution to our national defense . . . by Fairchild.



A Division of Fairchild Engine and Airplane Corporation

... WHERE THE FUTURE IS MEASURED IN LIGHT-YEARS!

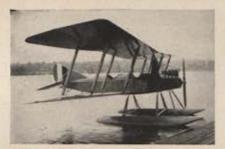


AIR FORCE THE MAGAZINE OF AMERICAN AIRPOWER

Volume 39, No. 8 • August 1956

TENTH ANNIVERSARY ISSUE

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1916 Model C, pioneered international air mail service, between Seattle, Wash., and Victoria, B.C.



1927 'The Boeing 40-A was one of America's earliest airplanes in transcontinental mail-passenger service.



1932 The 247, first 3-mile-a-minute airliner, set basic design for all modern twinengine transports.



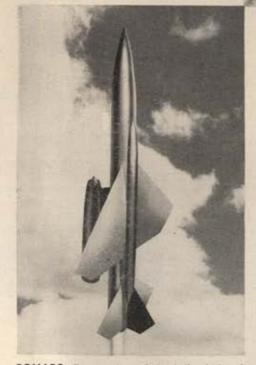
1942 B-29 Superfortress, world's first nuclear weapons carrier, backbone of America's heavy bombardment force in the Pacific during World War II.



Keeping America

1944 'The Stratocruiser, spacious double-deck airliner, famed on luxurious "name" flights. Veteran of 200,000,000 miles, more than 30,000 ocean flights.





BOMARC. Supersonic guided missile, designed to strike enemy aircraft while still over areas well away from vital targets. Performance details are secret.



1952 B-52 eight-jet Stratofortress. World's leading intercontinental bomber. Speed: over 650 mph. Operating altitude: above 10 miles. Described by defense officials as "the most formidable expression of air power in the history of military aviation."



1936 B-17 Boeing Flying Fortress, first modern heavy bomber. Revolutionized aerial warfare.



1939 'The 307, America's first four-engine, pressurized transport. First four-engine airliner in transcontinental service.

first in the air



1947 B-47 six-engine Stratojet medium bomber, America's current frontline nuclear weapons carrier, being refueled in the air by a Boeing KC-97, standard aerial tanker of the Air Force.

Here, climaxing an era of aviation achievement, you see America's first jet transport—along with other Boeings that have marked significant advances in aircraft performance.

Each is a product of imaginative Boeing design and efficient production. Behind each aircraft is a tradition of leadership that began 40 years ago, when Boeing was founded. During this span, Boeing created a succession of epochmaking aircraft.

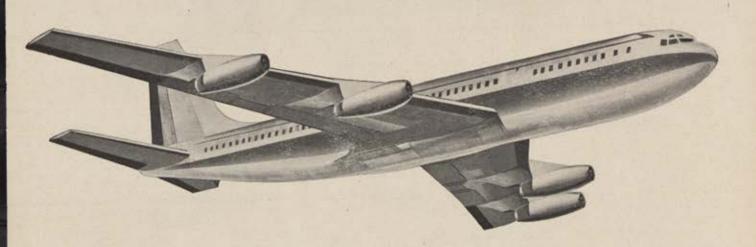
In Commercial Aviation—the pioneer 40-A; and the 247, first modern 3-mile-a-minute airliner; the 314 flying boat; the original Stratoliner, first pressurized transport; and the luxurious Stratocruiser, familiar around the world.

In Military Aviation — such trend-setting fighters as the PW-9; the revolutionary B-9 bomber, which could outspeed any contemporary fighter; the historic B-17 Flying Fortress and B-29 Superfort, culminating in today's revolutionary B-47 and B-52 multi-jet bombers.

And for Tomorrow – the 707 Commercial Jet Transport, the military KC-135 jet tanker-transport, and the defense weapons system based on BOMARC, Boeing's long-range, pilotless interceptor guided missile.

Boeing's 40-year tradition of leadership continues to help keep America first in the air.

BOEING



1956 The 707, America's first jet transport, ordered by eight airlines for delivery beginning late in 1958. Prototype holds transcontinental transport record: 3 hours, 58 minutes. KC-135 configuration will be world's first multi-jet aerial tanker.



Out where there are no runways, Vertol helicopters are strong links in the chain of Air Force logistical support.

The eyes of our Air Defense Command—the Early Warning radar outposts in the Far North and off our coasts—are tied to their supply centers by Vertol helicopters. Daily H-21 Workhorse helicopters shuttle personnel and tons of equipment to remote radar and communication stations; they have already played an indispensable part in the construction of these outposts.

Tactical Air Force combat teams depend on the rugged H-21's to fly them into action, to airlift reinforcements and supplies to them.

Airmen downed in remote areas, civilians hard hit by disaster . . . for these, the H-21's in the Air Rescue Service may mean safety, shelter—and survival.

U.S. AIR FORCE

Engineers, join Vertol's

advanced engineering team!

VERTOL

Aircraft Corporation

MORTON, PENNSYLVANIA

FORMERLY PIASECKI HELICOPTER CORPORATION

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A sight that is very rarely seen—a USAF and a Russian airplane parked side by side. The AF's Douglas C-124 Globe-master II and the sleek new Russian jet airliner, the TU-104 Tupolev appeared at the Swiss International Air Show.

- A former member of the Joint Chiefs of Staff has proposed that that body be scrapped and replaced with a general staff. In his column in Newsweek, Gen. Carl Spaatz, USAF-Ret., former AF Chief of Staff, said that the present Joint Chiefs are in the "impossible position of being both pleaders for their services and judges ruling on their pleas." He feels that a general staff composed of senior officers from the four services but "detached from them. completely independent of them, and without responsibility except to a Chief of Staff, a civilian Secretary of Defense, and the President acting in his capacity as Commander-in-Chief," would be the answer to interservice feuding. According to Spaatz, we are getting no bargain from the \$35 billion spent on defense annually because the services have been allowed to compete for talent and materials in developing the same weapons.
- In an unexpected move, the Russians invited Chief of Staff Gen. Nathan F. Twining to attend the Soviet Aviation Day celebration on June 24 at Moscow's Tushino airport. With President Eisenhower's approval, General Twining, along with some of his best research and development, production, and operations brains, climbed aboard a C-118 at Washington's National Airport on June 21 and took off in murky weather for the first leg of the trip to the Russian capital.

The Russians had a full schedule waiting for the visiting airmen. Starting off with the air show, the group visited airfields, factories, and training institutions, and appeared,



An artist's conception of the Convair Golden Arrow, 609mph jet airliner. Both TWA and Delta have ordered it.

along with other delegations from both sides of the Iron Curtain, at the usual banquets and parties. Their hosts brought out several new aircraft and modifications of known types, but would not let the group get more than a brief look at them. The Russians would only permit the Americans to see a couple of outmoded factories, but then showed them the latest in training facilities. General Twining and his group were plainly impressed by the caliber of instruction and the equipment available for training at the Zhukovskii Air Engineering Academy in

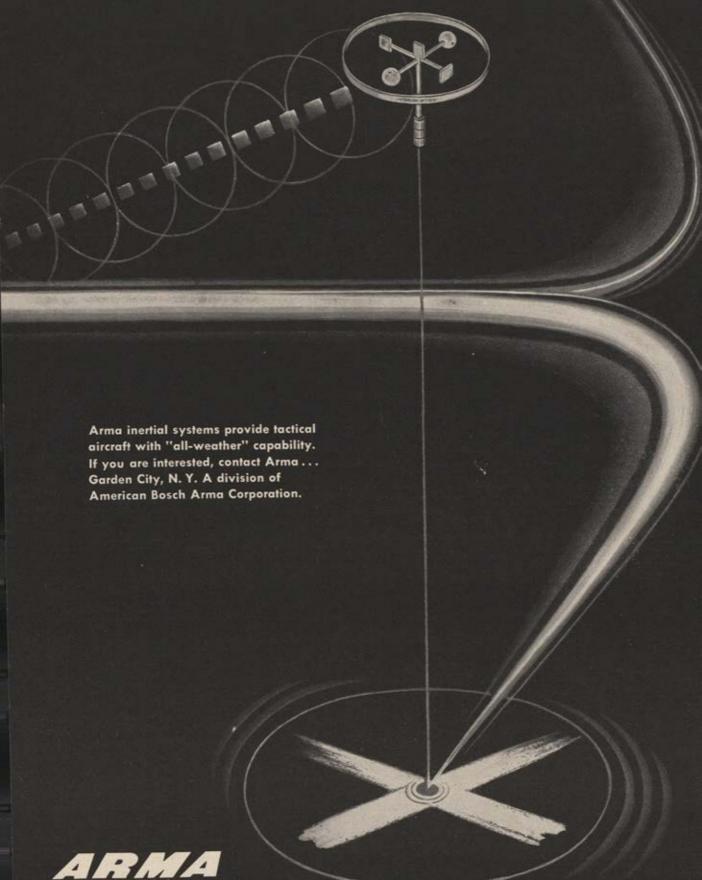
While no new information of importance resulted from the trip, it was probably of value if only because it gave our top air strategists a chance to size up their opposite numbers. For a more complete report of the trip in General Twining's own words, see page 60.

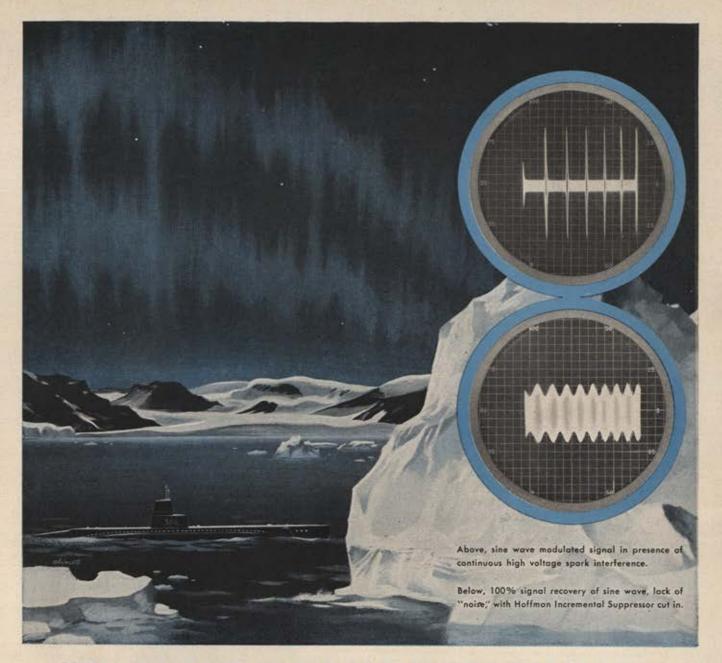
- In a special statement to the Senate Appropriations Subcommittee on Defense, Assistant Secretary of Defense Carter L. Burgess has reviewed long-range problems and actions on the personnel problem, Mr. Burgess told the group that personnel losses and critical technical needs "is not a problem that faces the Department of Defense and the armed services alone in today's world." He cited the following as elements to be considered in the over-all personnel picture.
 - An aggressive national industrial might.
- · The largest armed forces ever maintained by America short of a going war.
- · Highest industrial employment rate in history, accompanied by a strong economy and a high standard of living.

These factors, according to Mr. Burgess, call for a sizeable number of technically and professionally trained individuals. Large-scale industrial activity and large-sized military forces, according to Mr. Burgess, are in competion for personnel. Also, he pointed out, "The stability and higher take-home wages of industrial employment works in competition with the obligations, uncertainties, locations, rigors, and dangers of military life-not to mention certain aspects of lower military and government income."

Three ways of approaching the personnel problem, according to Mr. Burgess, are first, the broad one of better circumstances under which men and women of the armed forces serve, such as "better housing, reasonable tours of continental duty as compared to duty in overseas or outlying and remote areas, assured medical care for depend-

(Continued on page 23)





HOW TO GIVE NOISE THE SILENT TREATMENT

SITUATION: A submarine surfaced somewhere in iceberg country, attempting to establish communications with distant base.

PROBLEM: Interference, or "noise", critically garbles message reception. Radio operator cannot hear message above interference.

SOLUTION: Operator switches on Hoffman Incremental Interference Suppressor, an exclusive feature of Hoffman Communications Receivers. Atmospheric noise is silenced—vital message comes through loud and clear.

This significant achievement in the science of communications has undergone extensive field tests under rugged service conditions. Tests demonstrate that in CW, FSK and AM communications, Hoffman-developed noise limiting techniques can give 100% message recovery from a signal containing atmospheric static 80 decibels greater than the carrier. Interference caused by static,

corona discharge, lightning and most man-made noise is reduced to a minimum. Result: clear, reliable radio-communications under extremely adverse operating conditions. The imaginative engineering teamwork and skill that pioneered in the reduction of noise in radio communications is ready to tackle your communications problems too—from basic research through final production.

Hoffman Laboratories is engaged in these many other associated fields of electronics:

Airborne Radar and Navigational Equipment ... Missile Guidance and Control Systems... Electronic Countermeasures... Advanced Communications Techniques in the VLF, HF, VHF and UHF regions... High Speed Search and Electronically Tuned Receivers.

This creates a constant need for engineers and physicists of highest calibre. Professional stature in mechanical engineering, electrical or electronics engineering or physics is required.

Write Vice President of Engineering:



A subsidiary of Hoffman Electronics Corporation 3761 SOUTH HILL STREET, LOS ANGELES 7, CALIFORNIA ents, adequate schooling and so on." Secondly, he urged elimination of many inequities which cause discontent within the armed forces. Third, according to Mr. Burgess, is reimbursement-"and when I say reimbursement I am not talking just money. I am talking about status in the community and standard of living. I mean pride in profession and accomplishment as well as ability to provide for their families in a manner which compares more favorably with what similar talents could attain in industry." Stressing further the fact that dollars alone would not solve the problem, Mr. Burgess said that "an indispensable quality of career military service, similar to that found in the teaching profession, or the ministry lies in a profound dedication to high purpose." He told the members of the subcommittee that "if our Armed Forces are to be manned with competent people, dedicated to the security of their country, we must make military life a wanted career."

- After several malfunctions, Aerojet-General's Aerobee-Hi sounding rocket was successfully kicked off to a new world's record of 163 miles late in June. The previous world record for a single-stage rocket was 158 miles—set by Martin's Viking in 1954. The company's Liquid Engine Division is now designing a "second-stage" rocket engine for Project Vanguard (the earth satellite to be fired by the US during the International Geophysical Year, 1957-58) incorporating many of the Aerobee-Hi's features.
- In the 1956 US Olympic Track and Field Trials in Los Angeles on June 29 and 30, five Air Force athletes were named to the US track and field team which will compete in Melbourne, Australia, next winter. They are: Lt. Thane Baker, Lockbourne AFB, Ohio, who will compete in the 100-meter dash, the 200-meter dash and the 400-meter relay; Lt. Parry O'Brien, Travis AFB, Calif., shot put; Lt. Lon Spurrier, Hamilton AFB, Calif., 800-meter run; Lt. James Lea, Edwards AFB, Calif., 400-meter run and 1.600-meter relay; and A/IC George Mattos, March AFB, Calif., pole vault. Alternates are: Lt. Desmond Koch, Long Beach Municipal Airport, Calif., discus throw; and A/IC Jerry Smart, Shiroi AB, Japan, 10,000-meter run.
- Last fall, Gen. Lauris Norstad told AIR FORCE that one of NATO's biggest problems was proper dispersal of air-fields to minimize the damage from enemy attack. He pointed out that adequate dispersal was a costly proposition. The Western Allies have now decided that even though expensive, more dispersal is necessary. Gen. Cortlandt Van Rensselaer Schuyler, chief of staff to SHAPE's



Col. Andrey A. Underkoffer is new head of the AF Medical Specialist Corps, replacing Col. Miriam Perry.



Col. Frances I. Lay is the new head of the AF Nurse Corps, replacing Col. Verena M. Zeller, who retired.



National Civil Service League's 1956 Career Service Award went to Ezra Kotcher of the Wright Air Development Center.

Gen. Alfred M. Gruenther, has announced that NATO will boost its number of air bases from 174 to 250. The new fields will be "squadron type," and will each handle only twenty-five planes compared to the seventy-five or more handled on present bases, and the men will be quartered in tents several miles away to reduce injuries in case the runways are bombed.

■ Early in July, President Eisenhower signed the military appropriations bill for fiscal 1957. The bill calls for new funds authorization of \$16.4 billion for the AF—including about \$1 billion more than originally requested from Congress. The extra funds were tacked onto the bill over the objections of the Administration—particularly Secretary of Defense Wilson, who did not agree with Congress that the AF needed the extra money. Under the bill, the Navy will be authorized \$9.9 billion and the Army \$7.5 billion for a total—including also funds for interservice activities and the Office of the Secretary of Defense—of \$34.6 billion. The AF's share breaks down as follows:

THE REAL PROPERTY AND ADDRESS OF THE PERSON	
Aircraft and related procurement	\$6,848,500,000
Procurement other than aircraft	1,140,000,000
Research and Development	710,000,000
Operations and Maintenance	3,724,185,000
Military Personnel	3,718,440,000
Reserve Forces	59,300,000
Air National Guard	258,700,000

TOTAL \$16,459,125,000

These totals exclude construction funds which are being requested separately.

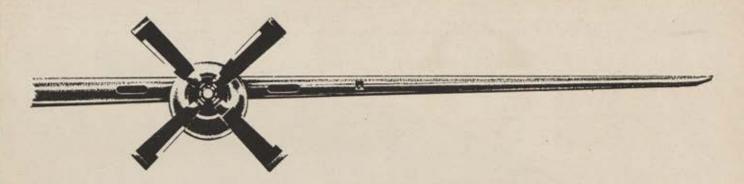
- In a note to Moscow, the US has charged that the Russians are holding at least ten officers and enlisted men from a Navy bomber lost over the Baltic Sea in 1952 and an AF B-29 reported missing during the Korean war. The note said the information had been received from prisoners who have been freed by the Soviets during the past several years.
- The Air Force Association has announced that it will present cash awards of \$300, \$200, and \$100, respectively—along with appropriate plaques—to the authors of the three best papers presented at the Fourth Annual ARDC Science Symposium in Boston on October 9 and 10. Conducted annually, the symposium gives technical and scientific personnel of ARDC a chance to present original aspects of their work to an informed and critical audience. The new awards, initiated by the Air Force (Continued on following page)

Association, will recognize the outstanding scientific and technical paper written by a military or civilian scientist or technician working within the Air Research and Development Command. The awards will be given on the basis of the absolute worth of the work described, the contribution of the work to the future performance of the AF mission, and the quality of the preparation and presentation of the paper. The awards will be presented at the next meeting of the Science Symposium, which is scheduled to be held in October.

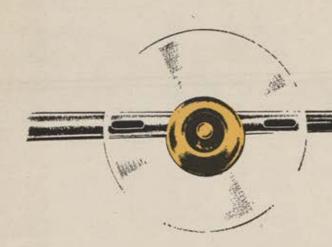
■ STAFF CHANGES.... Maj. Gen. Millard Lewis moved from his position of Deputy Director of Intelligence to Director of Intelligence, DCS/Operations, Hq., USAF, replacing Maj. Gen. John A. Samford. General Samford is now Vice Director of the National Security Agency. . . Brig. Gen. Edgar A. Sirmyer, Deputy Commander, USAF Security Service, will be reassigned as Commander, 6920th Security Wing, in September. . . . Brig. Gen. James Ferguson, Deputy Director of Requirements, is new Director of Requirements, DCS/Development, Hq., USAF, replacing Maj. Gen. George E. Price who has become Commander of AMC's Sacramento Air Materiel Area. . . . Maj. Gen. Lyman P. Whitten retired on June 30. . . . Brig. Gen. Keith K. Compton, Commander, 813th Air Division, SAC, Pinecastle AFB, Fla., has been assigned duty as Commander, 823d Air Division, SAC, Homestead AFB, Fla. . . . Maj. Gen. John K. Gerhart, formerly Chief, Military Assistance Advisory Group, United Kingdom, has replaced Maj. Gen. Robert M. Lee as Commander of the Twelfth Air Force. General Lee is now Commander of the Fourth

Allied Tactical Air Force. . . . Maj. Gen. Delmar T. Spivey, Commandant, Air War College, Air University, retired from active duty in June. . . . Brig. Gen. Eugene P. Mussett, Deputy Chief of Staff, US European Command, will be reassigned in October as Commander of the 341st Technical Training Wing, ATC, Lowry AFB, Colo. . Maj. Gen. Lewis R. Parker will become Director, OSAF Personnel Council, Hq., USAF, in October. He is now Commander of the Air Materiel Force, European Area, and he will be replaced by Maj. Gen. William T. Hefley who has already vacated his position as Commander of AMC's Sacramento Air Materiel Area. . . . Brig. Gen. John C. Horton, DCS/Personnel, Hq., ADC, Ent AFB, Colo., will move to Hq., USAF, in August to become a member of OSAF Personnel Council. . . . Brig. Gen. Oscar F. Carlson will retire in October from March AFB, Calif. . . . Maj. Gen. Wycliffe E. Steele has been appointed Deputy Director, Joint Construction Agency, US European Command, and will assume office in August. He is now Commander of the 3650th Military Training Wing, ATC, Sampson AFB, N. Y. . . . Brig. Gen. Edward H. Alexander, Special Assistant to the Deputy for Operations, Hq., TAC, Langley AFB, Va., has retired. . . . Brig. Gen. James F. Whisenand, Commander, 49th Air Division, USAFE, became Deputy Commander of the Third Air Force, USAFE, in July. . . . Maj. Gen. Frederic E. Glantzberg, Commander of the Seventeenth Air Force, will report to Hq., USAF. in August for an assignment which has not been announced. . . . Brig. Gen. Herbert W. Ehrgott, Deputy Director, Joint Construction Agency, US European Command, is processing for retirement from active duty.-END





3 MINUTE ENGINE STARTS AT -65°





with the Janitrol Hot Fuel Priming Unit

To take a Curtiss-Wright turbo-compound engine, coldsoaked at minus 65°F for three solid days, and get it firing in one minute—and running clear in three minutes—that's quite a stunt even in this day of miracles.

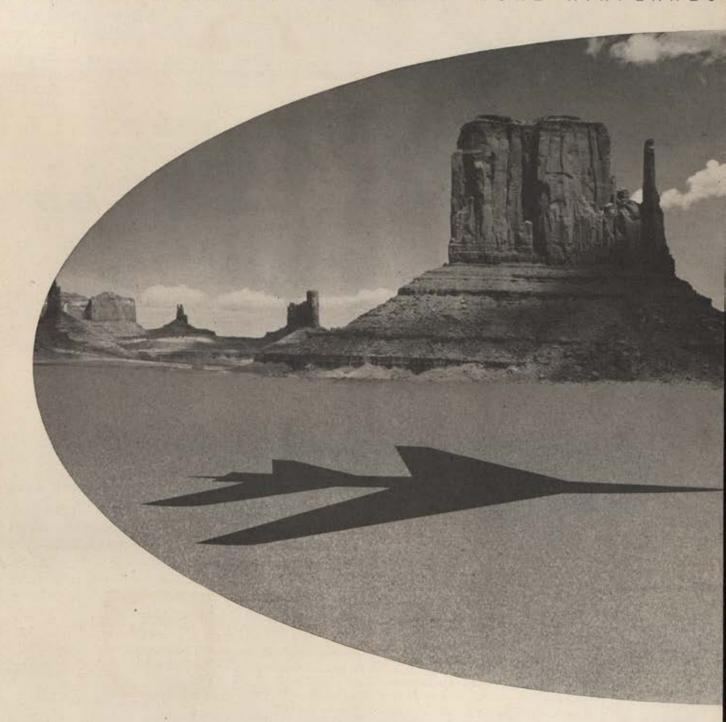
The Janitrol Hot Fuel Prime Unit does it, not just now and again, but repeatedly, reliably. It is less than 18 inches long, weighs under 16 pounds, heats fuel from minus 65°F to 200°F, and supplies hot fuel at the required rate as long as necessary to insure smooth engine operation. It draws less than seven amps, can be used while the starter is on.

Engineering bulletin on request.

Call in your Janitrol aircraft engineering representative for help with problems in aircraft heating, gas turbine components, and combustion equipment.



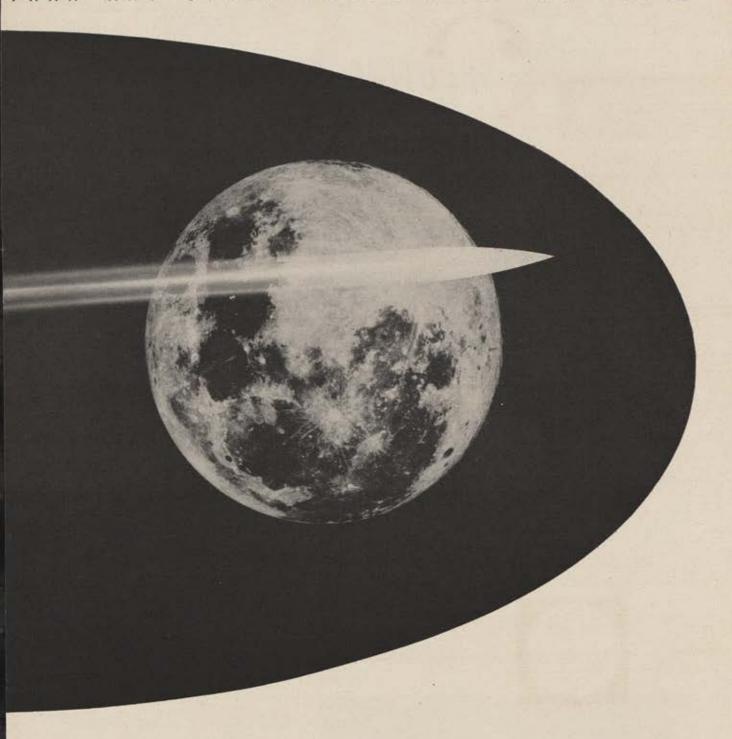
A I R C R A F T - A U T O M O T I V E D I V I S I O N
S U R F A C E C O M B U S T I O N C O R P O R A T I O N
Columbus 16, Ohio



SHADOW

Tomorrow's aircraft are casting their shadows before them. Details of their performance are incredible. Yet their most dramatic asset is still the fact that a human pilot will be at the controls. For there is no mechanism that possesses man's power of judgment . . . his ability to capitalize on opportunity. At North American—home of the U. S. Air Force F-100 SUPER SABRE, the free world's first operational supersonic fighter, and the Navy FJ-4 FURY—this is the order of the day: to make tomorrow's planes habitable by man, while they operate at speeds and altitudes which otherwise would be beyond his physical limitations.

NORTH



SPACE SILHOUETTE

The shape of things to come in long range missiles looms ever clearer at North American. More than ten years ago, North American engineers started work in an almost unexplored technological world. This was the birth of the U.S. Air Force's SM-64 NAVAHO Intercontinental Missile. Today -though security restrictions prohibit any details - we can tell you that the automatically controlled NAVAHO is playing a vital role in the Air Force's program of missile development, so essential to our nation's security.

North American Aviation, Inc., Los Angeles, Downey, Canoga Park, Fresno, Calif.; Columbus, Ohio

AMERICAN AVIATION, INC.





SHOOTING THE BREEZE-

WITH THE EDITORS OF AIR FORCE MAGAZINE

Defense Secretary Charles E. Wilson has created a new agency of 100 civilian scientists, charged with the evaluation of competing weapons—along much the same line as that recommended by the Air Force Association back in 1953. In its Statement of Policy that year, the Association said:

"The nation sorely needs a competent and objective evaluation of its military effectiveness. The Air Force Association believes that such an evaluation demands the establishment of an independent commission of leading civilians . . . [the group] should be non-partisan and its

directive should be broad in scope."

The new group-named the Institute for Defense Analyses-has been set up as a non-profit corporation in Delaware-at the request of the government-by the Massachusetts Institute of Technology, Stanford University, the California Institute of Technology, Tulane University, and the Case Institute of Technology. IDA will take over the work of the Weapons Systems Evaluation Group established by the late Secretary of Defense James Forrestal in 1948. It will be headed by Maj. Gen. James McCormack, Jr., USAF-Ret., assistant to the President of MIT and one of the speakers at AFA's Fifth Annual Airpower Symposium in New Orleans on August 1. Dr. Albert G. Hill of MIT, former head of the Lincoln Laboratories, is research director for the new group. According to Doctor Hill, IDA's job "is to give Defense Department officials an independent analysis and evaluation free from interservice rivalries.'

"We must remain completely non-partisan," Dr. Hill added.



Government security officers do have their problems. Their latest is a genius who is not cleared for access to secret papers by the Defense Department, but who keeps coming up with "top-secret" ideas. Former Assistant Secretary of the AF Trevor Gardner, testifying Before a House Government Operations subcommittee, said that the results of this man's work have been stamped secret and then "he no longer has access to them." He added, "We can't seem to classify his head."



A new series of films, "Airpower," produced by CBS Public Affairs in cooperation with the USAF, will make its debut on a special one-hour program November 11. The remaining twenty-five parts of the series will be broadcast on successive Sundays thereafter from 6:30 to 7:00 p.m., EST. In the making for the past two years, the series, narrated by CBS News Correspondent Walter Cronkite, will deal with the story of the development of flight and its impact on Twentieth Century man.

Resulting from a search through more than 300,000,000 feet of film from all parts of the world, "Airpower" will take the viewer from the invention of the airplane to supersonic planes and missiles and on into a glimpse of rockets and the future of aviation. It will also show the stories of some of aviation's heroes—men like Billy Mitchell, Rickenbacker, Doolittle, and Lindbergh. The series was produced by Perry Wolff, Peabody Awardwinning producer-director-writer, Brig Gen. Robert L. Scott, Jr., Director of the AF's Office of Information Services, acted as technical advisor. It will be sponsored by the Prudential Insurance Co. of America.



Another film of interest is one produced by Northrop Aircraft, Inc., also in cooperation with the AF. The twenty-eight-minute color movie entitled "Airman Smith, Candidate for Honors," is aimed at encouraging AF recruiting and reenlistment, and records the events that lead up to and follow the decision of a young man to (Continued on page 31)



Just as we were going to press, headquarters of the 4750th Air Defense Wing (Weapons), Yuma County Municipal Airport, Ariz., sent us this photo which we decided was a natural for our "Breezecake" this month. The girl is Marlene Bates, seventeen-year-old queen of the Yuma County Fair, who's admiring the trophy that went to the victors in the Continental Air Defense Command's rocketry shoot-offs at Yuma in July. Marlene, an Arizona State College student as well as a model, is seated on a mockup of an F-86D. Chief judge of the meet, held to select the team to represent ConAD in the USAF Rocketry meet in October, was Lt. Col. James Jabara, triple jet ace of the Korean war.

First in Constant Speed Drives...





Sundstrand Constant Speed Drives foster new electrical concepts in B-47E

New concepts of an aircraft electrical system, as demonstrated by the startling improvement in the B-47E over earlier models, can be attributed in great part to the Sundstrand Constant Speed Drive. Stable electrical power—availability of 80 KVA from the first automatically paralleled alternators used in a production airplane, plus close control of frequency and voltage—brought new reliability and new effectiveness to the Auto-Pilot and "K" Bombing System. These automatic navigation, identification, and bombing systems now operate at optimum level, increasing the B-47E's effectiveness as a modern weapon. A Sundstrand-driven electrical system can help solve your problem—write us.

New Electrical Horizons...

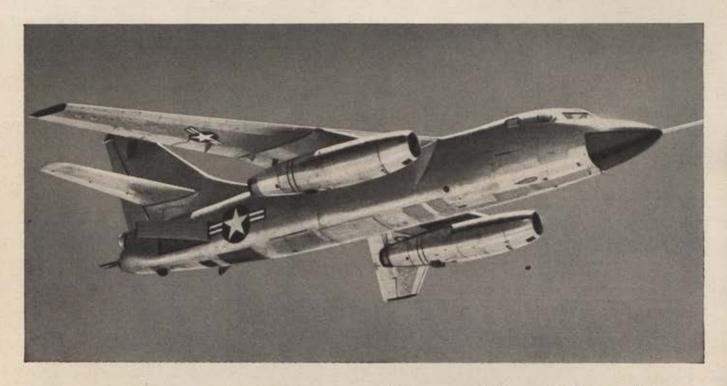
are opening to design engineers, through co-operation between engine and airframe manufacturers and Sundstrand. With this new concept in electrical systems, expect remarkable advances in operation and performance of tomorrow's aircraft.

SUNDSTRAND AVIATION

Division of Sundstrand Machine Tool Company, ROCKFORD, ILLINOIS Western District Office: Hawthorne, California

CONSTANT SPEED DRIVES . AIRCRAFT ACCESSORIES

FOR THE AIR FORCE TACTICAL AIR COMMAND



Air Force RB-66 powered by Allison J71 Turbo-Jet Engines



Here you see the Tactical Air Command's newest reconnaissance bomber—the all-weather twin-jet Douglas RB-66.

It carries a payload of nuclear or conventional bombs—which it can wing at 600-700 mph to targets dictated by the nation's needs.

It packs a full complement of camera equipment —which also makes it a valuable reconnaissance tool for air intelligence.

And in pods under its wings it boasts a pair of Allison J71 Turbo-Jet engines — each producing 10,000 pounds' thrust without augmentation — which take it to altitudes over 40,000 feet.

Now winning its wings for reliability and dependability with the 363rd Tactical Reconnaissance Wing at Shaw Air Force Base, S. C., the Allison-powered RB-66 carries a three-man crew as it goes on its peace-maintaining missions.

The Allison-powered Douglas RB-66 is another example of how continuous engine development —both Turbo-Jet and Turbo-Prop—is helping keep America first in the air.

ALLISON DIVISION OF GENERAL MOTORS, Indianapolis, Indiana

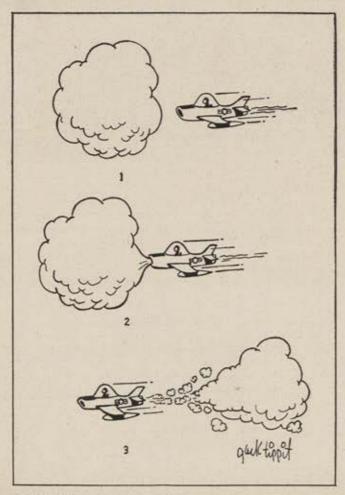
become an airman. 1st Lt. Leonard R. Smith, USAF, and his wife, Bethanne, play the roles of Airman Smith and his wife in the movie. The film is available for TV shows, meetings, luncheons, etc. Anyone interested in showing it should contact Bill Cox, Motion Pictures, Radio and Television, Dept. 1310, Public Relations, Northrop Aircraft, Inc., Hawthorne, Calif.

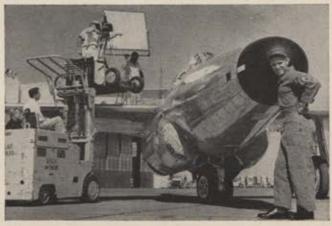


On a TV program, AF Chief of Staff Gen. Nathan F. Twining mentioned that the AF hoped to have the Convair B-58 supersonic medium bomber flying by fall. When Rep. F. Edward Hebert, D.-La., appearing on the same program, said that he had seen the airplane, General Twining, remarking that he had not seen it yet, asked "How did it look?" Answered Mr. Hebert: "Can't answer that-I'm bound by security, General."



Sen. Barry Goldwater, R.-Ariz., got off some pretty good public relations advice in a speech before the Air War College in Montgomery, Ala. A jet pilot in the AF Reserve, Senator Goldwater told the group of officers that selling the AF to our citizens breaks down into several parts-first, an understanding of "the proper role of the military in shaping national policy"; second, "the development of airpower as the dominant force in our national military strategy"; third, "the effectiveness of the Air Force in interpreting the potentialities of airpower"; and fourth, "the public relations measures which could and should be taken to develop better understand-





Leading performers in a new Northrop Aircraft, Inc., movie are 1st Lt. Leonard R. Smith, who plays "Airman Smith" in the film, and the Northrop Scorpion F-89D.

ing and support of airpower as the dominant factor in modern war." He said that historically, the military "has been subservient to the needs of peace," in this country and that there should be a reconsideration of the "historic role of the military in the United States, and its relationship to our national and international policies. . . . The American people should be told, the Senator said, "that military force is not an isolated thing, as we have in the past considered it to be, but that it is an integral and intimate part of our national policy-in fact, an instrument of national policy." He said that if this broad acceptance of the military role can be accomplished through proper education, "then we in this nation will be fully receptive to the place of the Air Force as the dominant source in our national military strategy."

Senator Goldwater stressed the difficulties in educating the nation in this respect. "You and I know," he said, "that war in this country has always been looked upon as an isolated thing. We have gone into them unprepared . . . because the people of the United States, having a natural and understandable abhorrence of war, have never concerned themselves with the true relationship of war to our national policy."

His suggestions for dealing with the problems:

 An intensive campaign of education—in the schools, in the Air Force itself, at clubs, meetings, luncheons, and

 An understanding of the problems by the top brass in the AF and the ability to transmit this understanding down through the ranks to the lowest enlisted grade.

· A thorough check on releases before they are made to see that there is no conflict with existing classifications.

 An open-door policy toward the press and public. The public information officer must be in the know, he must be kept informed of the latest developments.

 Public relations officers should sell the AF in its entirety and not just their own particular outfits.

· Public information officers should work closely with

the aircraft industry.

• The AF should make a more concerted effort to educate the members of Congress concerning the true meaning of airpower and airpower's natural position as a pivotal force in forming our military strategies.

By applying these techniques, Senator Goldwater said, "Public relations in the Air Force will improve rapidly and the people of the United States will develop a better understanding of airpower and will give it the proper

(Continued on following page)

support which it deserves as the dominant force in modern war."



It is difficult to understand why laws can't sometimes have a heart. A case in point is a letter we received from the USAF's head of recruiting, Brig. Gen. Arno H. Luehman. General Luehman received a letter from two Czechoslovakian airmen who flew their military trainer out of Communist territory on March 13, 1953, for the one purpose of getting to the US to join the Air Force. But, because of a curious set of circumstances, they are unable to come to the US from Canada where they are now living. They appealed for help to General Leuhman, and he forwarded their letter to us.

Here, briefly, is their story: after landing in the British Zone of Austria, they were sent to England where they lived for sixteen months before they immigrated to Canada. Because they are firmly "resettled" in a friendly country, they are not classified as "refugees" under the Refugee Relief Act, and because they are neither a husband, brother, or son of an American, they get no preference and must wait their turn under the Czechoslovakian quota, which is already heavily oversubscribed. Both registered for entry with the US Consulate General in Toronto on October 18, 1954. And it looks as if they may have to wait at least another two years before they are permitted to enter the US.

Rep. H. A. Williams, D.-N.J., informed of the airmen's plight by a cousin of one of them who lives in his congressional district, has proposed revisions of American immigration policies. "We talk about encouraging people to look to us as the shining hope of abundance and humanitarianism," he said, "but what, in fact, do we hold out to them in the form of our immigration laws?" His office told Air Force that "he has tried everything in an effort to help in this particular case, but so far has ended at a blank wall." Congressman Williams feels that because these airmen risked their lives to escape from the Communists, we should give them a break. In their letter to General Luehman they say that their "idea to join the United States Air Force was born in the early days of the Second World War when thousands of . . . American planes were covering our skies in victorious air raids against the German occupiers." They say they are willing to start from the beginning with the AF, and close with the plea: "Please give us the chance."





Those AFA members who enjoyed the cool breezes of San Francisco at last year's AFA convention will be amused at the way a fashionable men's store in Washington, D. C., was caught with its wash-'n'-wear pants down. The store mailed a pitch on lightweight summer suits to convention-bound Republicans—implying that San Francisco is hot in August. When weather-conscious San Franciscans objected, the store apologized and offered more suitable clothing.



This year instead of again using the official Air Force emblem on our Anniversary Issue cover, we're featuring our own AFA emblem. And for the very special reason of our tenth birthday. Like most ten-year-olds, we have had our share of crises, and our share of good times; we have grown quite a bit, and we still have a long way to go (see page 42).



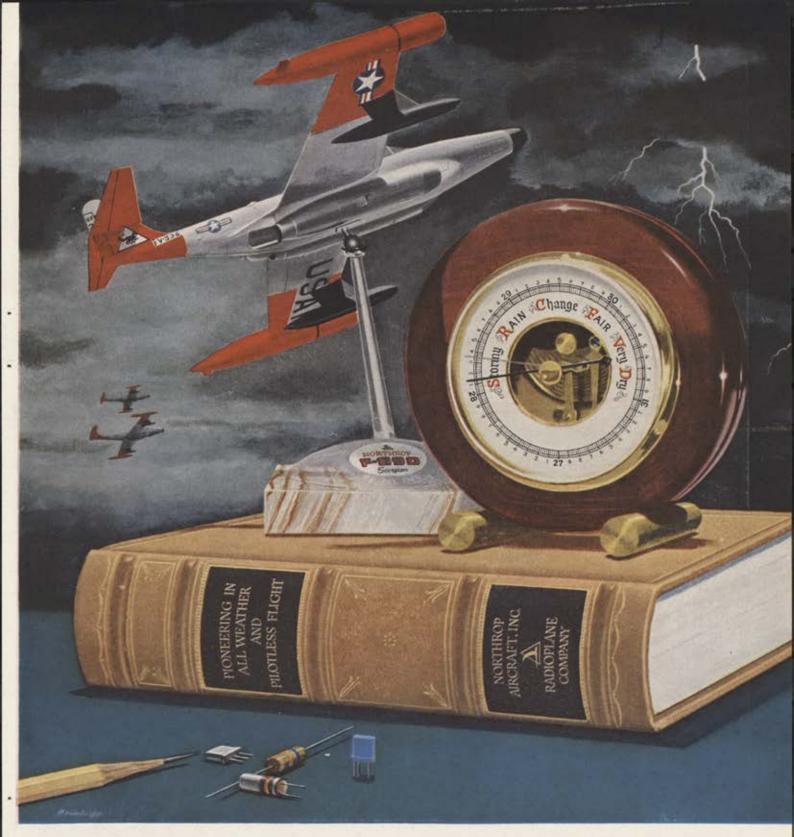


Down in the Georgia swamp, where cotton and dacron would be appropriate, a group of self-made politicians—some hardly dressed and others in feathers—were dreaming up some rather oblique angles to put their candidate, a possum named Pogo, into the White House. Their behind-the-scenes maneuvering will be carried into millions of American homes from both the Democratic and Republican conventions because NBC has hired Pogo's creator, cartoonist Walt Kelly, to inject a bit of humor into the proceedings. When nothing much is happening on the convention floor, the TV cameras will switch to Kelly and a group of loyal Pogo workers. Among them will be sometime Atra Force Magazine author Sam Moore (see "Some of Them Made It," July '56).



Just heard about a program that may be one answer to the lagging interest in science education that threatens to leave us with a serious shortage of scientific brains. The Hughes Aircraft Company and the Los Angeles City school system have gotten together on a project to stimulate science education in junior and senior high schools and to offer up-to-the-minute industrial science laboratory experience for teachers. Under the program, scientists of the Hughes Research and Development Laboratories will present weekly lecture demonstrations for summer students at Los Angeles High School, and ten science teachers from city schools will be given summer work in the Hughes laboratories. Dr. L. C. Van Atta, associate director of the Hughes laboratories and one of the coordinators of the program, said that "our concern is for basic education in science at all school levels, not only for those boys and girls pursuing careers in science, but also for the far greater percentage who will constitute the bulk of our citizens and lawmakers of tomorrow. . . . We wish to act at the level at which 'shortages' of scientific personnel begin, and the level at which the bulk of our population receives its total science education, in the secondary schools.

The program at Los Angeles High School calls for instructional assistance in senior physics classes with supervision by the regular teacher. It is planned to provide equipment not normally available to high school students. The ten teachers working at Hughes for the summer, in addition to working on specific projects, will be given orientation lectures and study scientific and engineering approaches to modern industry.—End



FORECAST: SECURITY—Northrop's dramatic development of long-range, all-weather interceptor aircraft is an important factor in our country's program for protection in the air. As a pioneer in this and other fields, Northrop has initiated many achievements that contribute to national safety. These accomplishments include the Northrop Scorpion F-89 interceptors now stationed at the U.S. Air Force's most strategic bases, ready to rise and destroy hostile aircraft under "impossible" weather conditions. Also included are Radioplane Company's versatile drones and missiles, and Northrop's unmanned Snark SM-62 intercontinental A-bomb carriers. New weapon systems of tomorrow are now being developed by Northrop engineers and scientists. Economical output and prompt delivery are assured by Northrop's balanced production force which capably matches the company's years-ahead vision and planning.



Pioneers in All Weather and Pilotless Flight



Air Force, Lockheed, General Electric cross new scientific frontiers to develop...

THE PLANE THAT OUTRUNS THE SUN

Powered by General Electric's startlingly new J79 jet engine, the F-104A is the world's fastest fighter, represents significant break-through for U.S. aviation



"Permanent security through airpower can only be achieved by close teamwork between the Air Force and private industry. The new weapons systems now appearing exemplify the results of this teamwork."

> DONALD A. QUARLES Secretary of the Air Force

When the Lockheed F-104A with its powerful new General Electric J79 jet engine was unveiled to the press a few weeks ago, it forecast a new era in military aviation. Now, in one mighty technological surge, American engineers are beginning to cross barriers of heat, shock and sound that have threatened to slow America's air progress. This new scientific break-through is good evidence that America can hold the qualitative lead in airpower.

The Lockheed—General Electric achievement with the F-104A and the J79 is especially significant because both plane and engine are original new designs, not just refinements of older models. The wings of the F-104A, for instance, are only two inches thick: their leading edges as sharp as a knife. The General Electric J79 incorporates many

new principles of design and produces more power per pound of weight than any other jet of comparable size. The result is an aircraft so powerful that it climbs as fast as it can fly straight and level. And although its official speed has not been released, it's no secret that the F-104A can fly considerably faster than the earth rotates.

Record-Time Development of the J79 was accomplished by advanced engineering methods and new procedures of testing. For example, in an unprecedented step for an engine of this type, the J79 was flight-tested by General Electric in a special Navy jet, the Douglas XF4D. Never before has a new American jet engine been flight-tested in a single-engine aircraft before initial delivery to airframe companies. Result: a saving of development time and money.

Even before installation in the F-104A, the General Electric J79 was ready-to-go, proved in flight. When the engine was installed in the F-104A last February, giant strides in aircraft performance became a reality. The rest is history. General Electric Company, Cincinnati 15, Ohio.

Progress Is Our Most Important Product

GENERAL



ELECTRIC



THE GENERAL ELECTRIC J79 was first tested slung under a North American 8-45 bomber "flying test bed" at Schenectady, N. Y. Data from these tests indicated the course of further development.

FINAL "WRINGING OUT" was accomplished by operating the J79 in an XF4D at Edwards, California. Thus Lockheed received a new jet engine with actual flight experience in a fighter aircraft.







The recent visit of Gen. Nathan F. Twining, the AF Chief of Staff, to Russia coincided with the publication of a handy and interesting volume, Soviet Air Power, by Richard E. Stockwell (Pageant Press, \$7.50). What General Twining and his aides were shown lends timeliness to Stockwell's appraisal of Russia's air technology and the Soviet effort to gain world leadership in the air. Stockwell claims we have been nonchalant about Russian airpower too long. His theme is supported by chapters on Red aircraft production and design, guided missile development, pilot training, civil airline progress, and Korea-the Soviet testing ground. Detailed maps pinpoint Russian aircraft production centers, long-range bomber bases, missile test centers. Charts outline the Red Air Force organization. Photos and technical data sheets round out the picture. A supplement to the book lists details on seventy Russian aircraft and fifty-five turbojet, turboprop, and rocket engines now in production or under development. The author, former editor of Aviation Age, presents very little information on the Soviet Air Force that has not earlier been published elsewhere in the American press. But what makes his book is the compilation of all this data into a highly readable, if not too general, story of Russian aviation, military and civilian, from the first "claimed" Russian flight in 1882 to the present.

A little over a year ago we reported an encouraging trend toward getting good Air Force reading between hard covers of books. With full AF backing this trend spiraled. Another thirty-three air books have appeared in the past fifteen months (compared with the half dozen or so published the two years preceding). With good books tumbling off the presses and more planned, the AF's number one problem now is to make the books available to the AF family worldwide. Several plans for internal marketing are under study. One would place hard-cover AF books on sale in all AF Base Exchanges. Another would be an Air Force Book Club. Action on both may be expected

this fall.

A third measure is a mail order system conducted by the Air University Book Department. AFR 176-6 identifies the following people as eligible to order books at special prices: members of the armed services; foreign students, civilian students, and faculty members at service schools; members and units of the National Guard, Air Guard, Army and AF Reserve, and Army and AF-ROTC cadets not on active duty. If you qualify, write to the AU Book Department, Maxwell AFB, Ala., giving title, author, and publisher, number of copies, and the address to which they should be sent. You must also state your duty assignment, whether active or reserve, and certify that the books are for your personal use. Payment can be made in advance or on receipt of an invoice.

Here are some recent air books we recommend. All are available from the AU Book Department. The special

price includes postage:

U. S. Military Doctrine, A Study and Appraisal, by Brig. Gen. Dale O. Smith, USAF. Examines military doctrine and the role of airpower in military and national affairs. Foreword by Gen. Carl Spaatz, USAF (Ret.) (Duell, Sloan and Pearce)—\$2.75.

Beyond Courage, by Clay Blair, Jr. Outstanding stories of heroism and courage of AF combat pilots. Foreword by Gen. Nathan F, Twining, USAF (David McKay)

-\$2.80.

Maybe I'm Dead, by Joe E. Klass. Historical fiction

based on AF POW death march in Germany, World War II (Macmillan Co.)-\$3.75.

Airman at Yalta, Gen. L. S. Kuter, USAF. Personal account of Yalta and the airpower considerations (Duell, Sloan and Pearce)-\$2.45.

Across The High Frontier: The Story of Test Pilot Maj. Charles Yeager, USAF, by W. R. Lundgren. A biography of an air pioneer. Foreword by Lt. Gen. J. H. Doo-

little, USAF (Ret.) (W. R. Morrow)-\$2.95.

Valley of the Shadow, by Maj. Ward Millar, USAF. Millar's capture, imprisonment, and escape from the Communists in Korea. Foreword by Gen. O. P. Weyland, USAF (David McKay)—\$2.80.

Men, Rockets and Space Rats, by Lloyd Mallan. The AF's preparation for flight into outer space. Foreword by Lt. Gen. T. S. Power, USAF (Julian Messner)-\$4.90.

Airpower, by Asher Lee. Air strategy and use of airpower in modern war (Frederick Praeger)-\$2.95.

Look of the Eagle, by Brig. Gen. Robert L. Scott, Jr., USAF. Fast-moving fiction story of an AF jet pilot (Dodd, Mead)—\$2.80.

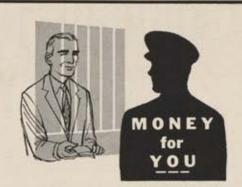
The Hurricane Hunters, by Ivan R. Tannehill. The history of hurricanes and AF hurricane hunting (Dodd, Mead)-\$2.45.

The Hunters, by James Salter. A top-notch novel about the Korean air war and swirling jet combat high above MIG-Alley (Harper and Bros.)—\$2.55.

Right Down the Line: A Book About Leadership, USAF Edition, edited by Charles A. Pearce. An excellent, punchy, cartoon-illustrated "text" on the principles of good AF leadership (Arrowhead)—\$1.90.

Knight of the Air, by Maxwell A. Smith. Life and works of Antoine de Saint-Exupery, author and airman of fortune

(Pageant Press) -\$3.20.-END



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Commissioned and warrant officers in the armed services on active duty: you owe it to yourself to find out about this unique new OFFICERS FINANCE PLAN... with emphasis on immediate loans anywhere in the world. Send coupon for our surprisingly simple draft form and instructions.



ON OPERATION DEEP FREEZE, a Sikorsky helicopter flies over the Antarctic volcano Mount Erebus. The commanding officer of the Navy Task Force praised the performance of the four HO4S helicopters on Oper-

ation Deep Freeze. Typical of their accomplishments, one helicopter in a 24-hour period ferried 200 men to the shore base from ships five miles away. No other transportation was possible because of breaking ice.

AROUND THE WORLD WITH SIKORSKY HELICOPTERS



S-55s FOR SOUTH AFRICA—The South African Air Force has bought two Sikorsky S-55s. These aircraft, with a third now on order, will be used for rescue and other emergency duties. Above, a pilot officer checks controls before takeoff from the Sikorsky plant on a training flight. S-55 type helicopters serve with all armed forces of the U.S. and those of many free nations.



FOR OIL WORK OFFSHORE—Among oil companies using Sikorsky helicopters to speed drilling offshore in the Gulf of Mexico is The California Company. The company recently purchased two new S-55s to join two already flying for the firm off Louisiana. In Gulf operations the S-55s are equipped with flotation gear. Above, one of them flies past Sikorsky's new plant control tower.





FIRST MARINE CORPS HELICOPTER

In November, 1947, at Quantico, Va., this Sikorsky HO3S became the U. S. Marine Corps' first helicopter. Progressing from such early uses as air-sea rescue, being demonstrated in this photo, the Marine Corps has created new assault tactics built around the mobility of the helicopter and its unique ability to transport men and equipment anywhere. Today, huge HR2S helicopters promise the large scale airlift capability essential for vertical envelopment.

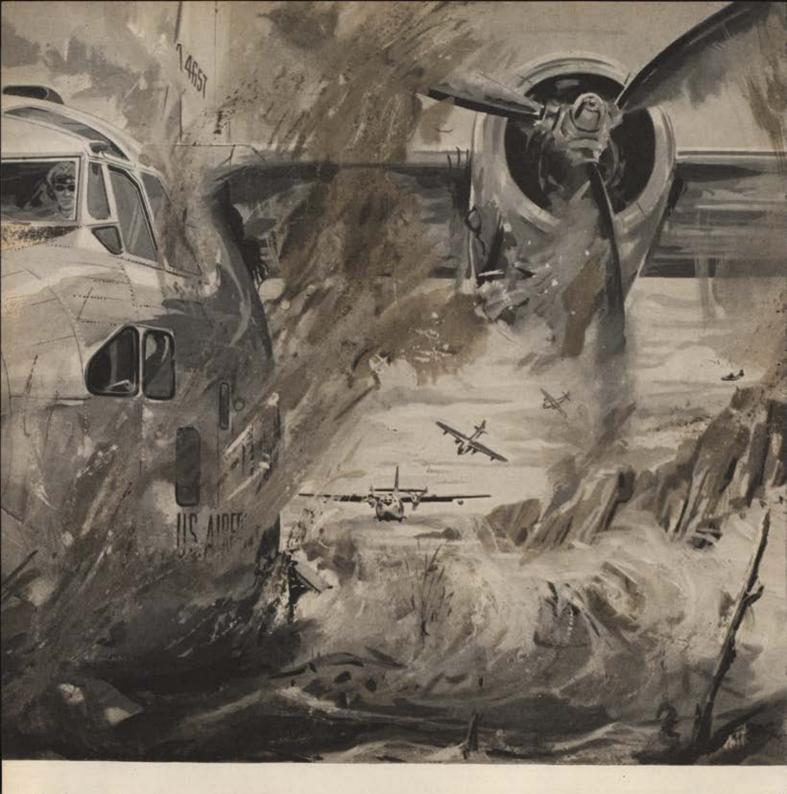
JOINING THE MARINES—This huge twin-engined Sikorsky HR2S assault helicopter topped performance expectations on its recent flight from Sikorsky's Stratford plant to the Naval Air Test Center, Patuxent River, Md. It was the first production delivery flight. This helicopter, known as the H-37 in the Army version and as the S-56 in the commercial version, has retractable landing gear and two Pratt & Whitney R-2800 engines. Its speed, range, and payload capabilities reflect marked advances in the art of helicopter design and production.



SIKORSKY AIRCRAFT

BRIDGEPORT, CONNECTICUT

One of the Divisions of United Aircraft Corporation



Combat commuter -

at 8 second intervals



A Division of Fairchild Engine and Airplane Corporation

... WHERE THE FUTURE IS MEASURED IN LIGHT-YEARS!

In recent tests duplicating actual assault landings, Fairchild C-123's gave dramatic evidence of performance under combat conditions.

The target-a rough, ungraded field-was ringed by "hostile" forces. Heavily laden, the C-123's approached the field at 500 ft. altitude-too low for heavy A.A. guns, too high for small-arms fire. Just short of their touchdown point, the highly maneuverable assault transports swept down, flaring out just as they flashed over the clearing's edge. Two minutes later, twelve C-123's had rolled to a halt-troops and trucks were fanning out to their assigned positions. The C-123's had landed at 8 second intervals!

This dramatic demonstration of pilot and crew proficiency was made possible by C-123 maneuverability, short field performance and utter reliability-all three, features of Fairchild aircraft designs.



Ten years ago the Air Force Association was born.

During the years since then, AFA has had its ups and downs, its victories and disappointments, but it has never lost sight of its original goal—"to assist in obtaining and maintaining adequate airpower for national security and world peace." In memory of this decade of effort

AIR FORCE MAGAZINE

PROUDLY PRESENTS ITS

Tenth Anniversary Issue

Dedicated to
the members of the Air Force Association
and

the men and women of the United States Air Force



One of AFA's first official acts in 1946 was a call on President Harry Truman at the White House. From left, Jimmy Doolittle, Willis S. Fitch, Forrest Vosler, Mr. Truman, Thomas G. Lanphier, Meryll Frost, and Jimmy Stewart.

1946



1956

An account of the first decade of existence of the Air Force Association

Through Ten Years

HE AIR FORCE Association, now celebrating its tenth anniversary, is part of the vast legacy left this nation by General H. H. "Hap" Arnold, World War II commander of the Army Air Forces.

When the AFA idea was conceived, no one knows for sure. With Hap Arnold big ideas came thick and fast.

We do know that the idea of a civilian airpower organization was born in a French villa southeast of Paris, near the wartime headquarters of the Strategic Air Force in Europe.

The time was April of 1945. General Arnold, despite a heart attack which eventually led to his death, was then inspecting AAF installations in Europe. With him was his special assistant, Robert Proctor, then a colonel, later a national director and national convention chairman for the Air Force Association.

General Arnold had just announced to Maj. Gen. Fred Anderson, now retired, that Anderson was being reassigned as Air Force Deputy Chief of Staff for Personnel in the Pentagon. Then the farsighted Arnold expressed his conviction that an independent civilian organization, based on alumni of the USAAF, would be needed to carry on the peacetime fight for airpower. He told Anderson to find

the man to head such a movement—a man of stature both in and out of military life, who would be returning to civilian status shortly.

A few months later, back in the States, Fred Anderson found the man he wanted. He was Edward P. "Ted" Curtis, who had served as Chief of Staff to Gen. Carl A. Spaatz in Europe. Curtis was then on terminal leave in the Pentagon, awaiting discharge from active duty and return to his executive job at the Eastman Kodak Company.

He was also recuperating from a wartime injury—his first. In two world wars—he had six kills in France in the first one—Curtis had emerged unscathed. But he became a Pentagon casualty when he inadvertently bailed out of a swivel chair and broke his arm.

What's more, the medies had pronounced him physically fit for discharge, broken arm and all. All of which shows how explosive the postwar demobilization really was, even for major generals. The country wanted the boys brought home—and in most cases the boys agreed. They couldn't wait to get out of "the suit."

Ted Curtis hadn't even got into his grey flannels when he received a letter from Hap Arnold, formally requesting him to organize a civilian airpower group. Ted accepted. The Air Force Association was on its way.

Several years later, in a message to an Air Force Asso-

ciation convention, Hap Arnold said:

"I am convinced that no distance nor circumstance can separate one member of the US Air Force from another. At such a reunion as this we are all present; active and retired, veteran and recruit, civilian and airman, at home and abroad; all here, all bound together by many things, and chiefly perhaps by the deep-rooted mutual respect and the strong, unshakable confidence and strength we have won through having together overcome obstacles the like of which no man could possibly have preconceived, to win a victory the like of which no man could possibly have imagined."

The first meeting of what would become the Air Force Association was held in New York City, October 12, 1945. Present, in addition to Ted Curtis, were Gen. Carl A. Spaatz, later Board Chairman and presently a national director of AFA; Julian Rosenthal, now national secretary of AFA; Rufus Rand, Willis Fitch, Everett Cook, J. H. "Jock" Whitney, C. V. "Sonny" Whitney, John S. Allard, Sol Rosenblatt, Col. Robert Eaton (now a major general commanding the Tenth Air Force), and W. Deering

Howe (now deceased).

The letter from Ted Curtis calling the group together had said:

"The present thinking is that this should not be a veterans' organization in the ordinary sense of the word....

It is to be strictly an air organization designed to perpetuate the fellowship of former members of the Air Force and to provide a national organization which will help to educate its own members and the public at large in the proper development of airpower. . . ."

The organizing group endorsed these objectives and made them the gospel of the new Association. At this time it was decided that the Association should throw rank out the window, with no distinction between former enlisted men and former officers. Julian Rosenthal, a former private first class, presented the enlisted men's point of view, backed by "Tooey" Spaatz and his four stars.

"Air Force Association" was agreed upon as the official title, and the new organization was so chartered on February 4, 1946. Its first nine members joined that day—Curtis, Rosenthal, Howe, Rosenblatt, and Allard, of the original organizing group, plus Jimmy Doolittle, Lowell Weicker, Grenville Carroll, and Jimmy Stewart.

Temporary officers and directors were selected, to serve until the membership in national convention could hold a democratic election. Doolittle was named the first presi-

dent of AFA.

National headquarters started literally at the bottom in a small basement office on K Street, in northwest Washington. Early in 1946, an AFA delegation paid a call at the White House. In the party were President Doolittle, vice presidents Meryll Frost and Tom Lanphier; directors

(Continued on page 45)



Farsighted Gen. Hap Arnold conceived AFA to fight for adequate airpower.



Edward P. Curtis helped organize the new group from USAAF alumni.



Jimmy Doolittle, the first president of AFA, laid down a national program.



Gen. Carl A. Spaatz, charter member, has fostered AFA from the beginning.



Jackie Cochran is one of many solid friends who have rallied to AFA needs.



General Eisenhower, guest speaker at '47 convention, paid tribute to AFA.



James H. Doolittle 1946-1947



Thomas G. Lanphier 1947-1948



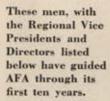
C. R. Smith 1948-1949



Robert S. Johnson 1949-1951



Harold C. Stuart 1951-1952





Arthur F. Kelly 1952-1953



George C. Kenney 1953-1954



John R. Alison 1954-1955



Gill Robb Wilson 1955-1956

PAST AND PRESENT NATIONAL OFFICERS OF THE AIR FORCE ASSOCIATION_

John R. Alison George A. Anderl James W. Aston Roy F. Atwood Thomas H. Baker, Jr. John P. Biehn Dr. John Biggerstaff Walter T. Bonney John Marshall Boone George H. Brett Benjamin Brinton Walter P. Budd, Jr. John H. Caldwell Thomas D. Campbell William H. Carter Sam Clammer Everett R. Cook John J. Currie Edward P. Curtis Warren DeBrown Burton E. Donaghy James H. Doolittle Ira C. Eaker John P. Edmondson Merle S. Else Dr. Cortez F. Enloe, Jr. Joseph J. Foss Meryll M. Frost B. E. Fulton Ashley Greene Robert Gross George H. Haddock William H. Hadley George D. Hardy Albert L. Harting Samuel M. Hecht John P. Henebry William Hensley G. Warfield Hobbs

Cecil C. Howard W. Deering Howe Russell F. Hunt Frank O'D. Hunter Ray Ireland Robert S. Johnson N. Michael Kavanaugh Arthur F. Kelly G. Stuart Kenney George C. Kenney Edwin A. Kube Thomas G. Lanphier, Jr. L. A. Larson W. Barton Leach Roy J. Leffingwell Rex V. Lentz Randall Leopold Carl J. Long W. R. Lovelace Bert D. Lynn Frank T. McCoy, Jr. James McCusker James H. McDivitt Thomas J. McHale Rev. John R. McLaughlin Clements McMullen Stanley K. McWhinney Dr. Jerome H. Meyer Ray S. Miller Willard W. Millikan Alex G. Morphonios W. D. F. Morrisson Henry C. Mulberger Msgr. William F. Mullally Msgr. Patrick E. Nolan T. Edward O'Connell Michel Pisani J. Henry Pool Dr. Paul C. Potter Robert Proctor

Earle P. Ribero Mary Gill Rice Sol A. Rosenblatt Julian B. Rosenthal Howard A. Rusk Glenn D. Sanderson Jay J. G. Schatz Peter J. Schenk William F. Shipman C. R. Smith Earl Sneed, Jr. Carl A. Spaatz Thomas F. Stack Thomas C. Stebbins J. Chesley Stewart James M. Stewart William H. Stovall Harold C. Stuart Edward R. Tufts W. Thayer Tutt Hoyt S. Vandenberg George C. Van Nostrand Forrest Vosler T. F. Walkowicz Hillford R. Wallace Frank W. Ward Jack L. Warner Jerome A. Waterman John Waters Albert J. Weatherhead Lowell P. Weicker Otto Wellensiek Ennis C. Whitehead C. V. Whitney John Hay Whitney Gill Robb Wilson Morry Worshill Winfield G. Young, Ir. Irving B. Zeichner

Charles W. Purcell

Cass S. Hough

Forrest Vosler and Jimmy Stewart; and Willis Fitch, first executive director.

Organization went on apace. Baltimore organized the first AFA squadron. The first AFA wing was begun in Ohio. Am Force Magazine, which had been the wartime official service journal of the Army Air Forces, was mustered out of service and joined AFA. It became the official journal of the Association. Later, after having been put on a sound publishing basis by John Edmondson and others, the magazine became the financial backbone of the Association.

Under Doolittle's dynamic leadership a national program began to take shape. By September 1947, when the Army Air Forces became the autonomous Air Force, thousands of its alumni, organized under the AFA banner, had aided in that cause.

In fact, the AFA crusade for an independent Air Force led Jimmy Doolittle to report to the first convention at Columbus: "No agency did more than the Air Force Association to achieve a co-equal and autonomous Air Force."

At the Columbus convention, for whose success the late Dick Wolfe was largely responsible, the climax speaker was Gen. Dwight D. Eisenhower, then Army Chief of Staff, who said:

"The creation of the United States Air Force as an independent entity recognizes the special capabilities of airpower; the creation of the Air Force Association recog-

nizes aviation problems that require specialized—and organized—civilian assistance toward their solution. In this group we have a wealth of military and civilian talent that will devote itself to our defense needs, even as it keeps always in view the potential usefulness of the airplane in bringing the world closer together in purpose as well as in time. . . ."

The bright future pictured for AFA at Columbus quickly changed to one of gloom. The honeymoon was over, and the bills were pouring in. Originally the Association had got going through contributions which Ted Curtis had collected, with the help of Sol Rosenblatt and others, from the first sponsors.

But by late 1947 a huge deficit had piled up. Tom Lanphier, the new president, found himself presiding over a series of "survival meetings," where he passed the hat oftener than he pounded the gavel. It became a fight for survival. The national headquarters was reorganized, the national staff pruned to the bone. Solid friends of AFA, like C. V. Whitney, Floyd Odlum, Jackie Cochran, C. R. Smith, and others, rallied round and kept things going. The encouragement of Stuart Symington, then Secretary of the Air Force, was a never-ending source of moral support. The wolf was kicked off the doorstep, for the time being at least.

Meanwhile, the Association led the fight for a seventygroup Air Force, as recommended in the monumental (Continued on following page)



The biggest names in show business, led by Bob Hope, filed across Madison Square Garden stage during the 1948 Wing Ding. That night, first of AFA's now traditional airpower awards were made.

Tennis balls—autographed by Tex McCrary, left, and Jinx Falkenburg, while Wing Commander Johnny Johnson, right, looks on—were lobbed from the Garden's stage to the Wing Ding audience by Jinx.





Static exhibits at '49 Air Fair, Chicago. It was later called "the greatest military air demonstration ever held."

work of the Finletter Commission, "Survival in the Air Age." AFA units across the country held airpower rallies to call attention to the nation's flagging air strength. From one meeting alone, in Westchester County, N. Y., went a telegram with hundreds of signatures to the White House, urging a larger Air Force.

But drastic action was needed to put the Air Force Association itself in business on the scale envisioned by its founders. With hardly enough money in the bank to meet daily expenses, Lanphier entered on a "do-or-die" effort to make the Association and its objectives better known to more people. To climax the 1948 convention in New York City, he rented Madison Square Garden for a night, then asked key people in show business to participate in a huge airpower rally.

Tex McCrary and Joshua Logan produced a four-hour show, featuring fifty headliners from all segments of show business, led by Bob Hope and Jimmy Stewart. They played to a packed house of 18,000 people, thanks to the back-breaking efforts of Convention Chairman Gill Robb Wilson, now AFA's president; C. R. Smith, and other volunteers on the convention committee. When it was all over, John Reid Kilpatrck, president of the Garden, called it "the greatest show ever put on in Madison Square Garden."

That show-also televised-made it clear to one and all that military airpower had behind it a civilian organization of strength and influence.

The New York convention was notable for still another reason, almost lost in the ballyhoo which surrounded the Garden show. In their business sessions that year, AFA delegates broadened their membership program, which had hitherto been based on present or previous Air Force service. A new classification, that of Associate Membership, was created in order to admit men and women who



Jimmy Doolittle presents Airpower Trophies to Bill Odom, Maj. Gen. William H. Tunner who led Berlin Airlift, and Capt. James Gallagher during the 1949 Chicago Convention.

believed in the Association and its objectives, regardless of service background or lack of same.

True, Associate Members were denied the right to vote or hold office. But the door was opened to developing the Association on a broad front, and made the organization more than a group of Air Force veterans fighting for airpower.

The following year, 1949, was the occasion for a further demonstration of this broad view. To dramatize its belief that airpower encompasses more than military aviation, the Association sponsored a record-breaking, round-theworld flight by scheduled airlines. Tom Lanphier made the long hop on AFA's behalf. On the trip, which lasted four days, twenty-three hours, and forty-seven minutes, Lanphier carried a large envelope which eventually came

to rest, bearing postmarks from around the world, in the National Air Museum of the Smithsonian Institute in Washington. The flight called new attention to the global

aspects of civil airpower.

On the other hand, 1949 also saw the Association sponsor what became known as "the greatest military air demonstration ever held." This was the National Air Fair, held in conjunction with AFA's 1949 convention in Chicago. With C. R. Smith at the controls as president, the Association filled O'Hare Airport, and the air above it, with military planes of all types. On hand was the B-50 "Lucky Lady" and the crew that had taken her on the first non-stop flight around the world. At the Air Fair a C-54 arrived direct from duty with the Berlin Airlift at the exact moment another C-54 took off from Chicago for Berlin—all to dramatize the achievements of Berlin Airlift crewmen, who that year won AFA's highest award.

Meanwhile the Association began its continuing campaign to upgrade the prestige of the military profession in the public mind and in the halls of Congress, and upgrade the military pay structure as well. For example, in 1949 C. R. Smith sent a letter to every member of Congress, pleading this case on behalf of the Association. Today, despite a few gains made, these same issues make up the top-priority problem of the defense establishment—and "Manpower" is the subject of AFA's 1956 Airpower Symposium.

Financial problems still nagged at the Association in



Envelope in Smithsonian: Tom Lanphier had it postmarked at stops on a record world flight by scheduled airlines.



The AF gave its first sonic airplane, the Bell X-1, to the Smithsonian at AFA's second Air Fair, in 1950 at Boston.

1949. While prestige was high, cash balances were low. With limited sources of income, the deficit was slowing the progressive development of the organization.

When Bob Johnson, one of the top aces of World War II, took over as president (he is the only man to date to serve two terms), he tried a bold and novel means of shooting down the deficit. If each member kicked in one dollar, reasoned Johnson, AFA could be solvent. So he sent a blunt letter to every member, candidly outlining the Association's precarious financial position. He asked for dollar contributions to "burn the mortgage."

Bob Johnson's dollar letter didn't quite burn the mortgage but it singed it around the edges. All told more than \$26,000 poured into the AFA treasury as a result of the appeal—a remarkable tribute to the loyalty and interest of the members. Equally significant was the fact that more than 10,000 letters were received along with the money, each in its own way pledging support of AFA objectives and expressing faith that the organization would grow and, ultimately, prosper.

During the ensuing years, that sort of faith and support was sorely needed. In June of 1950 the outbreak of hostilities in Korea rocked the structure of the Air Force Association. The hard core of AFA members were veterans of World War II. Their hard-won skills were sorely needed by the Air Force to carry out its new task.

The Korean aggression proved, the hard way, what the Association had been preaching since its inception that military unpreparedness is the surest path to war. Now many of its members were called upon individually to fulfill the nation's need for men trained in the arts of air warfare. As Air Reservists by the thousands were recalled to active duty, many Air Force Association units

(Continued on following page)



AFA's Airpower Awards for 1951 were presented in colorful Hollywood Bowl at climax of spectacular airpower pageant.



In L.A., in 1951, Bob Hope, Martin and Lewis, and many others from show business provided hours of entertainment.



Dr. Theodore von Karman, left, Alexander P. de Seversky and Capt. James Jabara visit at 1951 Airpower Banquet.

were well nigh stripped clean. For example, more than eighty-five percent of the members of the San Francisco Squadron alone were recalled. That San Francisco now boasts the second largest AFA Squadron in the nation is testimony that it is possible to come back. But it wasn't easy, and along the way AFA lost many of its ablest leaders and most effective units.

In 1950 AFA awarded its H. H. Arnold trophy to the airmen of the United Nations in the Far East. And it felt the pinch in national air strength at that year's Boston convention, when an air show was held with a Marine helicopter as the lone American aircraft participating. Vampires and CF-100s of the Royal Canadian Air Force did the military flying for AFA that year.

In 1950, AFA once more broadened its base of interest and became the leading civilian sponsor of the Air Force ROTC. It had for several years awarded Silver Medals to the top cadets on more than one hundred college campuses. Now it served as the catalyst in the amalgamation of three AF-ROTC honorary groups into one national organization, the Arnold Air Society. Next, AFA became its national sponsor. Today the two organizations enjoy a close relationship, with members of the Society also Cadet Members of the Association.



At a L.A. business meeting (1951): Secretary Julian Rosenthal, President Bob Johnson, Executive Secretary Straubel.

If AFA made its mark in Madison Square Garden in 1949, the Association "came of age" in Hollywood Bowl two years later. The Los Angeles convention marked AFA's fifth anniversary, and from the President of the (Continued on page 50)



In 1952, Jimmy Doolittle presents the AFA Science Award to Dr. Edward Teller for his work on the hydrogen bomb.



Walter P. Reuther was one of ten experts who spoke at the Air Preparedness Symposium at Detroit convention in 1952.



Representatives from the Air Force and industry exchanged ideas at AFA's '53 Airpower Symposium in Washington, D. C.



In his final public appearance, General Vandenberg accepts "Man of the Year" award from Harold Stuart in '53.



Jinx Falkenburg, left, interviews 1953 "Miss Airpower," Olivia Twining. She is the daughter of General Twining.





Left: AFA helped pay tribute to the Wright Brothers at Kitty Hawk on the fiftieth birthday of powered flight.

Top: TV and radio star Arthur Godfrey at the Omaha convention in 1954.

Right: Gen. Curtis E. LeMay, SAC's Commander, gives actor Jimmy Stewart a B-47 model at 1954 convention.





Nittany Squadron (Penna.) model plane exhibit in 1954. AFA sponsors many local—as well as national—programs.

United States to the Secretary of the Air Force and on down the line, everyone agreed that much had been accomplished in five years. Jimmy Stewart put it this way to the delegates:

"I remember back right after the war when the Air Force Association's slogan was 'Let's Keep the Gang Together.' This was a very important thing for us then. They busted up all the airplanes but we wanted to keep ourselves together. It's a wonderful thing to see that the Air Force Association has come of age. It's the kind of an outfit that can stand up on its hind legs and lay it on the line about airpower for everyone to hear. It's a wonderful thing to hear and I'm proud to be a member."



Jet ace Col. Francis Gabreski gets key to San Francisco. His wife, daughter, and Mrs. H. H. Arnold (left) look on.

President Truman's message to the convention expressed similar sentiments:

"I recall the day five years ago when I greeted several of your leaders at the White House shortly after your Association was established. I am delighted with the progress you have made in this relatively short period in banding together Air Force veterans with the common mission of adequate defense for national security and world peace.

"If in the years ahead the Air Force Association will continue to help keep our people alert to the dangers we face from militant aggression, and will help prevent any slackening of interest or effort in our military preparedness program, you will be doing the nation a great service."

Before a packed crowd in Hollywood Bowl, Jimmy Stewart, Bob Hope, and a host of airpower and show business personalities put on a spectacular pageant which dramatized the history of American aviation from the Wright Brothers' first flight to modern deterrent power, documented by AFA's designation of Gen. Curtis LeMay of SAC, as its "Man of the Year."

It was in 1951 and 1952 that AFA led the way in introducing to the nation a new breed of airmen—the jet combat pilots. Maj. Jim Jabara, the country's first jet ace, won the Association's Flight Award at the 1951 Los Angeles convention, and jet aces were honored also at later conventions in Detroit and Washington. The welcome for one of them—Col. Francis Gabreski—was a nostalgic reminder of the early days. Gabby, top ace of them all, was one of AFA's early leaders and its first Wing Commander in California.

Out of Los Angeles—with Art Kelly as convention chairman—came not only millions of words of publicity, but a new program for the Association. Industry had cooperated with AFA as never before in the staging of the huge airpower pageant in Hollywood Bowl. And now a program emerged which would bring these two elements of the airpower team closer together.

AFA's Industrial Associate program has resulted in a series of airpower conferences that have exceeded anyin Colorado Springs, Tactical Air Command in Washington; the huge Jet Age Conference of this year which brought together all elements of aviation for the first time to discuss the vexing issues surrounding jet noise, air traffic control, and airport expansion.

Along the way, the Association began its "Know Your Enemy" campaign. Behind the leadership of Art Kelly, its 1952 president, AFA called attention, editorially and in forum discussions, to the true nature and threat of Communism.

During 1953 and 1954, General George C. Kenney led the Association in its demands that Air Force POWs who had been victims of brainwashing and other forms of inhuman treatment in Korea, be given a break in the judgment placed upon them for false confessions of germ warfare. Later on, the organization took pride in the fact that the findings of the special Air Force Board which investigated the confessions were substantially the same as those of the Association.

When Chinese Communists began to make propaganda tools out of a small group of Air Force POWs they retained in their prisons, President John R. Alison in 1955 petitioned Congress, the White House, and the United Nations to take action. In calling the issue to national attention, the Association was, in part at least, responsible for the eventual release of these men.

In 1953, as the nation paused to commemorate the (Continued on page 68)



At premiere of "The McConnell Story," a highlight of the San Francisco Convention, Anita Ekberg, Joe E. Brown, June Allyson, and Hy Averbach on N.B.C.'s "Tonight" show.

thing of their type ever attempted in this country. Under the direction of Harold Stuart as president, the first of these was held in 1952 at the Detroit convention. This began the parade of specialists from various fields of endeavor to take the stage for presentations and giveand-take forum discussions on various areas of Air Age development.

The Detroit Preparedness Symposium was followed by a forum on "Tomorrow's Airpower" at the Washington convention in 1953; the Air Force Manpower Conference in 1954 which gave new energy to the Air Force recruiting program; the Air Logistics Conference later that year, which placed the nation's air logistics problems on top of the table for the first time; the series of Command briefings for industry and the Reserve forces—Strategic Air Command in Omaha, Air Defense Command



Popular speaker at AFA functions—Gen. Nathan F. Twining



Adm. Chester Nimitz speaks at memorial services in San Francisco.



AF Secretary Quarles speaks at AFA's Jet Age Conference.

* THE AIR FORCE ASSOCIATION ROLL OF HONOR *

A tenth anniversary is a fitting time to pay tribute to those who have contributed so much to AFA through the years.

Here are the names of those to whom particular honor is due

-NATIONAL CONVENTION CHAIRMEN-

Here are the names of the men who have served so well as chairmen of AFA's national conventions, from the

first get-together, in Columbus, Ohio, in 1947, to the most recent convention, in New Orleans, La., in 1956.

1947 Richard S. Wolfe (deceased) (Columbus, Ohio) 1948 Gill Robb Wilson (New York,

Calif.)
1952 Richard C. Hodges (Detroit Mich.)

1951 Arthur F. Kelly (Los Angeles,

 1954 Arthur C. Storz (Omaha, Nebr.)
 1955 Thomas F. Stack (San Francisco, Calif.)

N. Y.) 1949 Jay J. G. Schatz (Chicago, Ill.) 1950 Robert Proctor (Boston, Mass.)

1953 George D. Hardy & Samuel M. Hecht (Washington, D. C.) 1956 Frederick O. Rudesill (New Orleans, La.)

-AIRPOWER AWARDS-

The individuals below have received either an AFA Air-Power Trophy or Citation of Honor. Those that are starred have received AFA's highest award, the H. H. Arnold Trophy, awarded annually to "Aviation's Man of the Year."

Maj. Gen. Lucas V. Beau Lawrence D. Bell Capt. Charles F. Blair, Jr. Dr. William Bollay Brig. Gen. Albert Boyd William B. Bridgeman Milton Caniff Dr. J. L. Cate Maj. Stuart R. Childs Miles Clark Jacqueline Cochran Rep. W. Sterling Cole Lt. John M. Conroy, ANGUS Dr. W. F. Craven Fred C. Crawford Maj. Alexander P. de Seversky James H. Doolittle M/Sgt. Andrew J. Downey Francis and Katharine Drake *John Foster Dulles M/Sgt. John Fagrelius Brig. Gen. Bonner Fellers Col. Francis S. Gabreski Capt. James Gallagher Dr. Ivan A. Getting Arthur Godfrey

Dr. David T. Griggs

William Guthrie William Wister Haines Vern Haugland Rep. Carl Hinshaw Herbert H. Hoover Bob Hope Capt. James Jabara *Sen. Lyndon B. Johnson Philip G. Johnson (posthumously) Dr. Mervin J. Kelly Rep. Paul J. Kilday Charlotte Knight Paul Lavalle Beirne Lay, Jr.

*Lt. Gen. Curtis E. LeMay and the men of SAC Robert A. Lovett Tex and Jinx McCrary Capt. Vincent H. McGovern Charles J. V. Murphy Don Murray Edward R. Murrow William Odom Sen. Joseph C. O'Mahoney Thomas R. Phillips Lt. Col. James A. Poston, ANGUS D. W. Rentzel

Dr. Louis N. Ridenour Ray O. Ryan Col. David C. Schilling R. C. Sebold Dr. William Shockley Gen. Carl A. Spaatz Capt. Edward G. Sperry John Stack Lt. Col. John Paul Stapp James M. Stewart °W. Stuart Symington Dr. Edward Teller °Maj. Gen. William H. Tunner and the men of the Berlin Airlift Gen. Nathan F. Twining Dr. George E. Valley Gen. Hoyt S. Vandenberg Rep. Carl Vinson Dr. Theodore von Karman Dr. John von Neumann Jack L. Warner George S. Welch (posthumously) R. H. Widmer Gill Robb Wilson Dr. Dean E. Wooldridge Maj. Charles E. Yeager Eugene M. Zuckert

-AIRPOWER AWARDS-

In some cases the Airpower Trophies of Citations of Honor have gone to organizations or communities rather than to

individuals. Here are their names. The name that is starred was the recipient of AFA's H. H. Arnold Trophy.

*Airmen of the UN in the Far East Hollywood Coordinating Committee The City of Omaha, Nebr. The '52 Association (Jack Abramson) National Geographic Society The Smithsonian Institution The Thunderbirds Third Air Rescue Group, MATS US Junior Chamber of Commerce Young Men's Christian Association 435th Troop Carrier Wing

-AFA AWARDS-

Individuals listed below have received either Plaques or Medals of Merit in recognition of their service to the

Air Force Association. Those names that are starred represent the Air Force Association's "Man of the Year."

George I, Alberts

George A, Anderl
Vernon R, Arnt
Rouben Arvanoff
Bernard Barrett
Victor U, Bayers (deceased)
Will H, Bergstrom

William Lee Birch Samuel S. Boghosian Vernal I. Boline Paul Bolinger Walter T. Bonney Richard S. Boutelle I. E. Brodsky

Walter P. Budd, Jr. Mildred H. Buck Bill Byron John R. Caldwell Philip Caldwell Thomas D. Campbell Milton Caniff

Mrs. John L. Carr John L. Carr Curtis E. Christensen Charles Y. Cheriez Dudley Rogers Clark Philip G. Cochran Erwin H. Cooper John H. Crawford . Alan Cross John J. Currie Edward P. Curtis James F. Czach Stanley C. Denzer Robert A. Dobbins James A. Doeler
James H. Doolittle
Donald W. Douglas
T. C. Drinkwater
Flint Du Pre Ira C. Eaker John F. Edmondson Albert Eldridge James S. Ellis Merle S. Else Robert F. Emerson Dr. Cortez F. Enloe, Jr. Herbert C. Fisher Paul M. Fisher Y. Frank Freeman Frances Freundt Roland E. Frey William S. Friedman Meryll Frost John H. Garcia Harold L. George Richard A. Goldfogle Frederic P. Goulston William H. Graves, Jr. Jerome Green Ashley Greene M. Josephine Groesbeck Robert E. Gross
Robert L. Gross
Raymond G. Guay
Nicholas J. Gyopyos
William H. Hadley, Jr. Norman K. Haig Clyde H. Hailes Howard Halla Harold R. Hansen George D. Hardy Larry G. Hastings Samuel M. Hecht John P. Henebry William N. Hensley Richard C. Hodges Cass S. Hough Cecil C. Howard Frank O'D. Hunter

Ray Ireland David F. Jamieson Harry J. Johnson, Jr. Marian Johnson Vernon Johnson Herbert B. Kalish Frances E. Karr N. Michael Kavanaugh Arthur F. Kelly Rennie Kelly Irving H. Kempner Max K. Kennedy William G. Key J. H. Kindelberger Edward C. Kranch Gladys E. Kranch Edwin A. Kube Leroy S. Kwiatt Thomas G. Lanphier, Jr. Richard Lasher Norman M. Lauer Beirne Lay, Jr. Edward J. Le Fevre Roy J. Leffingwell Rex V. Lentz Stephen F. Leo Randall Leopold Mervyn Le Roy David S. Levison Merrill E. Levy Bert D. Lynn Leon Mandel George D. Mantell Robert N. Maupin Louis B. Mayer Emmett A. McCabe David F. McCallister Frank T. McCoy, Jr. John R. McCrary James H. McDivitt Stanley K. McWhinney Jerome H. Meyer Marietta C. Miller Norman Miller Willard W. Millikan John R. Mitchell Lloyd D. Mitchell Joseph A. Moller Kenneth V. Moore Charles O. Morgan, Jr. Alex G. Morphonios William D. F. Morrisson Joseph M. Murphy Kathleen Murray Joseph D. Myers Carl Norcross Floyd B. Odlum Mundy I. Peale

Bernard T. Peters Michel Pisani Paul C. Potter Robert Proctor Charles W. Purcell Clarence J. Reese James P. Regan Earle P. Ribero Mary Gill Rice Hazel D. Riley Mary Jane Rosenqvist Julian B. Rosenthal Fred O. Rudesill Robert J. Ryan Glenn D. Sanderson Walter R. Savage
Jay J. G. Schatz
Peter J. Schenk
William F. Shipman C. R. Smith Donald P. Spoerer William W. Spruance Thomas F. Stack Charles Stebbings Thomas C. Stebbins Donald W. Steele Ruth Stern Leonard J. Stevens James M. Stewart *Arthur C. Storz Howard Strickling Mrs. Richard A. Taylor Edwin A. Tomawski Edward R. Toffts
W. Thayer Tutt
George C. Van Nostrand
Robert C. Vaughan
James C. Vignola
William W. Walker T. F. Walkowicz John S. Warner Frank W. Ward Frank W. Ward Jerome A. Waterman Arthur G. Wegman Ennis C. Whitehead Ralph V. Whitener C. V. Whitney Joseph B. Whittaker W. Hamilton Wilcox Meir Wilensky George W. Wilson Gill Robb Wilson Kenneth B. Wolfe Richard S. Wolfe Kathryn B. Work Leonard A. Work Morry Worshill Winfield G. Young, Jr. Irving B. Zeichner

AFA AWARDS-

Air Force Association awards go to units as well as to individuals. Below are the names of all the groups with-

in AFA that have received Plaques. The names that are starred have been designated "AFA Unit of the Year."

Squadron, Ohio

Ak-Sar-Ben Squadron, Nebr.
Baltimore Squadron, Md.
Blair County Squadron, Penna.
California Wing
Chicago Group, Ill.
Chicago Squadron 41, Ill.
Cuyahoga Founders Squadron, Ohio
Detroit Squadron #1, Mich.
Du Page Squadron, Ill.

Hawaii Wing
Mifflin County Squadron, Penna.
N. Y. C. WAC Squadron, N. Y.
Pasadena Area Squadron, Calif.
Queens Squadron #1, N. Y.
Rainier Squadron, Wash.
San Diego Squadron, Calif.
*San Fernando Valley Squadron, Calif.
*San Francisco Squadron, Calif.

Santa Monica Area Squadron, Calif. Savannah Squadron, Ga. St. Louis Squadron #1, Mo. Toledo (Joe E. Brown) Squadron, Ohio Univ. of New Mexico AFA-Cadet Squadron, N. Mex. Wilbur & Orville Wright Memorial



At inquiry into US airpower, Sen. Stuart Symington (center) confers with Sen. Henry Jackson (right) and Sen. Sam Ervin.

1956-

O THE men responsible for building a combat-ready 137-wing Air Force, 1956 this is a key year—a year in which important decisions have to be made if the nation is to have the kind of force it has been promised ever since 1953.

The 1956 books are now being closed. By publication date Congress will have adjourned. Yet most of the important airpower decisions have been postponed. The fate of the 137-wing force has been re-hung on the budget actions to be taken in the Pentagon this fall in connection with Fiscal Year 1958.

It is now a sure bet that the goal of 137 "good wings" will never be met by the promised June 30, 1957. The program may be continued numbers-wise just for the record. But the inevitable result will be large numbers of "paper" wings, under-manned, partially equipped, and inadequately based.

If General Twining maintains the policy that combat effectiveness must be achieved, even at the expense of the size of the force, the only conceivable alternative is to reduce the number of wings.

Even though an air-minded majority in Congress gave the Air Force a notable and much-needed boost by appropriating \$900 million more than the Administration's requests, solutions to the number-one problem of manpower, real remedies for the deficiencies in the base system, and the really big money costs were all postponed until FY 1958.

In testimony on the Hill, the Air Force Chief of Staff called this "pushing the rug up in front of you." He saw this as a hump that would have to be hurdled, if we were to have an effective force of the size now planned.

The Air Force's estimate of the money needed to get over this hump in FY 1958 runs to \$23.6 billion, a \$7 billion increase over this year's budget. The Navy and Army are also planning on increased appropriations. The sum total of service estimates runs to \$48.5 billion, over \$13 billion more than the Administration's working ceiling.

Most of the savings made in the Air Force budget this year were one-shot reductions. They simply can't be repeated, and the "slashing methods" applied to the FY 1954 budget to the tune of \$5 billion are not possible if there is to be any pretense of continuing the 137-wing program.

Defense Secretary Wilson, always mindful of this fiscal picture, essayed the cautious guess that the Air Force might get a \$1 or \$2 billion increase. And General Twining, veteran of six years of budget battling, was already modifying the Air Staff estimate with phrases like "more than \$20 billion" and "around \$22 billion."

Whatever the outcome of the election, it is not realistic to believe that defense appropriations of this magnitude will ever be approved. Hints of moves toward reductions, even by this year's financing standards, were already being heard from top Administration authorities in the face of repeated warnings from responsible military and scientific witnesses that an increased effort was mandatory.

General Twining's unprecedented visit to the Soviet Union (see page 60) heightened national interest in the vital questions of where we stand today compared with the Soviets, and how we stack up in the technological race for superior air weapons of the future.

The Chief of Staff's report to the Senate Armed Services Committee did contain some comforting notes about the margin of air strength and technical superiority the United States enjoys today, But General Twining sturdily reiterated the warnings he has often voiced in the past. There was no change in his considered opinion that the Reds have made remarkable progress or that they have a vast and disturbing potential for increasing their airpower in the years ahead.

These grim prospects were also the main source of worry to Senator Stuart Symington, whose airpower subcommittee continued to probe for the facts about US air strength today and the heightened efforts that will have to be made in the future to keep US airpower on top.

The subcommittee wisely concentrated its efforts on the future, recognizing that our future air strength is keyed to the research and development efforts we have made in the past and are making today. An array of highly qualified witnesses in this field pieced together a pessimistic story.

YEAR OF INDECISION

We are faced with the alternatives of 137 'paper' wings or a lesser number fully manned, adequately equipped, and properly deployed

An AIR FORCE Magazine Staff Study

Leading off was Lt. Gen. Donald L. Putt, Deputy Chief of Staff, Development, and the top military R&D expert on General Twining's staff. General Putt's testimony gave little cause for complacency. Speaking from a background of twenty-three years' experience in aviation research and engineering, he put his finger on some of the main difficulties that significently retard US progress toward modern and more effective air weapons.

To no one's surprise, the chief obstacle has been money. But until General Putt testified, few were aware of the staggering list of deficits and deferrals in funds for projects that most people had been led to believe were receiving proper attention and adequate support. General Putt began his recital of facts and figures with a warning that the United States is losing its technological margin. And he punched home again the military fact of life that anything less than the best Air Force is national suicide.

Said General Putt, "As long as we have got a lead and there is a chance of keeping it, that is one thing. But to see that gap continually closing, the rate at which it is closing, and the fact that unless the trend is changedeither we change ours or the Russians change theirssome day they are going to be ahead. And it is too late to change the trend to do it tomorrow when the curves [of potential progress] might intercept. We have got to do

something about it today.

It was apparent from General Putt's testimony that some recent fiscal manipulations, however important they may be to more precise methods of accounting and bookkeeping, have confused the issue of how much we are really spending on Air Force research and development. This is an area where we have a technological base sufficient to insure steady progress. It is also an area where evident Russian progress is so great as to make mandatory much greater effort on our part. Yet our research and development funding has reached a plateau which, under the circumstances, is tantamount to a steady downward trend. The combination of the decreased buying power of the dollar and fixed budgetary ceilings, together with the need to undertake new projects every year, plus the requirement to continue the long-term profitable projects essential to continued modernization, place the Air Force's research and development effort in a squeeze that is readily apparent-even to a layman unversed in these rela-

tively technical areas.

To put the problem in common terms, it is like a young couple on a fixed income in a period of inflation. Prices are going up, the family increases in numbers, and in needs, the house must be painted and repaired. In such a situation, a fixed income becomes a steadily shrinking income and something has got to give. You eat cheaper food, half-sole your shoes, cut even essential spending, reduce your standard of living in general. That, in effect, is what a "leveling-off" of funding means to the Air Force's research and development effort.

Let's look at the development of the Air Force research and development funding pattern. In 1947 when the world was safe for democracy and the boys were safe at home, we dropped to a postwar low-\$110 million. There were slight increases in the following years. Then came Korea. When it became apparent we were really in a war, R&D appropriations skyrocketed, when compared with previous figures, to more than \$400 million. For FY 1953 a stillalarmed Defense Department and a wary Congress boosted

them to a new high-\$525 million.

The funding pattern from that time on is significant. Not because it parallels the advent of a new administration but rather because it falls within an era during which the Soviets were clearly developing a long-range air force capable for the first time of direct attack against the US homeland-an attack bearing weapons of mass destruction that many had predicted the Reds would find difficult to develop and produce.

Despite irrefutable intelligence that the Soviets had exploded both kiloton and megaton nuclear weapons, the financial pattern of our research and development programs retained the sameness of a Monday washday. Here again the figures cited in General Putt's testimony speak for themselves. In FY 1954 R&D funds were cut back to

(Continued on following page)

\$440 million. In 1955, a year that was to bring sightings of the first jet bombers of the Soviet long-range air force, and a year punctuated with further test blasts behind the Iron Curtain, R&D funds were cut to \$418 million.

Despite bookkeeping changes which tend to indicate that more dollars are being put into this technological breeding ground, the amount of money really available for this vital effort has remained essentially the same. Money is not the sole gauge of an improved airpower effort. But lack of it has inevitable results. General Putt named some of the areas that are being neglected because not enough money has been made available:

 The Distant Early Warning Line, upon which our strategic striking force relies for its alerting signals and upon which all the citizens of our many densely populated cities must depend if they are to survive a surprise attack.

 The SAGE system (Semi-Automatic Ground Environment), the means by which our defending missiles and interceptors are alerted and directed.

 New strategic bombers, replacements for the B-47 and B-52.

• The nuclear-powered bomber, labelled by General Twining a high-priority project, and an extremely significant weapon system even when intercontinental ballistic missiles become an operational reality.

 Long-range missiles of the air breathing type, such as Snark and Navaho.

 Long-range radar, particularly large, heavy radars for detection and warning against enemy ballistic missiles.

 High-energy fuels, designed to give added power and endurance to new aircraft engines.

 Test facilities, such as supersonic wind tunnels that would permit aerodynamic evaluation up to speeds of Mach Twenty.

Overshadowing all these needs, in relative importance rather than in amounts of money needed, is the pinch that is being felt in basic research. Without a solid foundation of "state-of-the-art" studies on which to build specific advances, our whole research and development effort in the aeronautical field will inevitably wither on the vine. In commenting on the funding of basic research projects, General Putt said, "For the next year the moneys that we will have to put on these studies which would have a great influence on our [R&D] programs for 1958, '59, and beyond, are reduced to practically zero."

In other words, we are attempting to build our research and development house on the sand, not of inadequate basic research funding, but on that of no funding at all. Thus the nation, for want of a comparatively few research dollars, stands to risk the loss of the mighty investment it has made in its defense establishment over the years. This is not good military logic. It is not good business logic.

When Mr. Trevor Gardner, former Assistant Secretary of the Air Force for Research and Development, was called before the subcommittee, he backed up General Putt's testimony in chapter and verse. Having quit his Pentagon job because he could not "in conscience" accept the Defense Department directives which govern our research and development programs, Mr. Gardner turned loose more details of R&D shortages. He told how lack of money had delayed the development of both combat and cargo aircraft, retarded warning system development, slowed the construction of much-needed engineering and test facilities, and generally jeopardized our position in the quality race.

Mr. Gardner was unequivocal in his assertion that the United States must spend more money on research and development if it is to survive. He attacked cumbersome administrative procedures as being wasteful of time and



Wide World Photos, Inc.

AF Secretary Quarles tells Symington subcommittee that B-47 fleet is "the most powerful striking force on earth."

talents as well as money. He castigated our present system as one of priorities without priority funds. Mr. Gardner agreed with Chairman Symington that "we are in the process of losing our qualitative position as well as our quantitative position unless we rapidly change our programs."

Prominent scientist James R. Killian, president of Massachusetts Institute of Technology and key scientific advisor to the President, endorsed the view that military research and development budgets should be increased. Dr. Killian pointed out that, by comparison, Soviet programs are almost completely unhampered by fiscal controls. He said, "One of the important pieces of information that comes to us about Russian progress at the present time is that they have apparently given great freedom, indeed blank checks, to their scientists and engineers in important areas to proceed without fiscal limitations." He warned against undue emphasis on fiscal controls coupled with a research philosophy which encroaches upon the essential freedom of action of scientific personnel.

All these expert witnesses recognized that a key limiting factor in any plan for program expansion would be a possible shortage of scientific and technical personnel. However, General Putt cited some surveys indicating that much more work could be done than is being done now. He sent sample inquiries to three airframe manufacturers, four engine manufacturers, and five electronic manufacturers. This informal survey indicated that, on the average, firms contracted to the Air Force could absorb about thirty percent more work within their existing personnel capabilities. Technical personnel might eventually limit our R&D capacity but obviously we're still standing considerably short of a full-bore effort.

From Gen. William Irvine's testimony, it was clear that if the R&D problems were solved, there would be few difficulties in getting production under way. General Twining's Deputy Chief of Staff for Materiel said there was plenty of room for expansion if decisions were made to go ahead and money were made available. While admitting that research and development was not his field, he labeled it the bottleneck in our efforts to keep the USAF modern.



General Twining has a word with Senator Symington before the AF Chief reports to Congress on his trip to Russia.

In the early days of the Symington subcommittee hearings, about the time General LeMay was citing the many shortages that plague the Strategic Air Command, Senators Saltonstall and Duff moved to widen the investigation. They said the inquiry could not be complete without considering the contribution the Navy and Army could make to total national airpower. Many predicted that bringing the Army and Navy into the picture would add to the flames of interservice controversy, but there is little evidence to bear out such a prediction in the testimony released thus far.

Naval representatives called to testify stressed the new weapons the United States Navy is now developing. Navy Secretary Thomas followed the time-worn geographical fact about "seventy percent of the earth's surface is water" with a description of some of these latest weapons. He praised the *Forrestal*, the nuclear-powered submarine, and the Navy's newest air development, the Martin Seamaster.

Discussing the problem of carrier vulnerability in the nuclear age. Navy spokesmen pointed once again to the forty-mile-an-hour mobility, the maneuverability, and the tough construction of present-day carriers. While restating the Navy claim that an aircraft carrier cannot be destroyed by a ballistic missile, they gave few satisfactory answers regarding the danger of attack by bombs or non-ballistic missiles.

The real questions—whether the Navy was capable of taking over part of the Air Force mission of strategic bombing, and whether it could fill existing and future deficiencies in the Strategic Air Command—were laid to rest. While claiming some offensive capability, though small by comparison with General LeMay's force, Admiral Burke candidly admitted that the Navy's air arm was not designed for this purpose, and would have its hands full with the Navy's own primary mission of controlling the seas.

The Army, when its turn came, sent its star witness, Lt. Gen. James Gavin, its research and development chief. With the help of other Army missile experts, he reviewed his service's programs and its plans for the future in the missile field. These range from present-day weapons already going into operational units to anti-missile defense weapons, including an anti-ICBM.

Army representatives also outlined a far-reaching philosophy and ambitious programs for Army organic aviation. Organic aviation was defined for one of the Senators as "any aircraft painted brown" and with an "Army insignia on its side."

A good many of the Army presentations were made against a background of general war in which all-out use of nuclear weapons was assumed. In contrast to this, General Gavin dropped a verbal bomb-shell that had farreaching effects throughout the world, particularly among our allies. He expressed a view that the H-bomb is so fearsome that all future wars may be limited to conventional arms. Describing the effects of thermonuclear weapons, General Gavin predicted they could spread death over entire continents. He said that if the United States were forced to make an H-bomb assault in force against the Soviet Union and the wind blew toward the southeast, widespread deaths would be caused over much of the Soviet Union, across Asia to Japan, and could possibly even extend into the Philippines.

Turning this ill wind around, General Gavin said that if it blew in the other direction, casualties could occur "well back up" into the Western European area. The publication of this statement added much to the worries of General Gruenther, who is still hard at work trying to shore-up a shaky NATO alliance, and it provided an unusual amount of grist for the Soviet propaganda mill. General Gavin spoke with confidence about a topic on which even the experts do not agree. Moreover, the horror picture painted by Gavin from his top-level Army position could not but undermine the United States philosophy of deterrence. Nor did he balance his statements with a discussion of the alternatives to a nuclear strategy which, while less modern in weaponry, are equally agonizing and deadly. And he neglected to mention the important fact that none of this would happen unless first provoked by Soviet aggression.

The witness long awaited by the subcommittee was Secretary of Defense Charles E. Wilson. In an open hearing, Mr. Wilson defended the Administration's airpower program without reservations and in the process he challenged the testimony of many of the previous witnesses heard by the subcommittee.

He took issue with General LeMay, who had predicted earlier that the present US program may hand over bomber superiority to the Soviets by 1959. In explaining this divergence of judgment, Mr. Wilson said that General LeMay had apparently not taken into account recent planned increases in B-52 production and the potency of the B-47 striking force. It was not clear how the rather slight increase of three B-52s a month could give rise to such a wide divergence of views. Nor did Mr. Wilson's testimony reconcile present procurement plans for purchasing fewer than 600 of these jet bombers with the need for hundreds more than this number as expressed by General LeMay.

The white-haired Defense Secretary also challenged the previous statement made by General Twining to the effect that the Russian Bison is comparable to the B-52. While performance characteristics of these aircraft are classified, there was no avoiding the fact that General Twining not only said that they were "comparable," he stated B-52 and Bison performance compared "favorably" during testimony before the full Armed Services Committee earlier this year.

(Continued on following page)



Defense Secretary Wilson, flanked by Adm. Arthur Radford and general counsel Mansfield Sprague, testifies before the Symington subcommittee. Second row: Army Secretary Brucker; Navy Secretary Thomas; AF Secretary Quarles. In third row: Army's Gen. Maxwell Taylor; Navy's Adm. Arleigh Burke; AF's Gen. Thomas White; and Marine General Pate.

YEAR OF INDECISION.

Faced with the testimony of General Putt and other witnesses in the research and development field, the Secretary made the flat statement that no important R&D projects have been delayed over the past three years "for lack of money.

Apparently disregarding some of the things he said back in 1953, he shifted slightly in his views on the nuclearpowered aircraft. Charged by the subcommittee chairman that he stopped work on this high-priority project, Mr. Wilson said that the pure research on this plan had never been halted.

At the conclusion of the Defense Secretary's three-day appearance before the subcommittee, Senator Symington charged that Mr. Wilson had made statements "inconsistent with the sworn testimony of leading military officers of the United States," including General Twining and the Director of the Central Intelligence Agency, Mr. Allen Dulles. The Senator further alleged that Mr. Wilson made statements contrary to previous testimony given before the full Armed Services Committee.

Concluding his statement, Senator Symington had this to say:

"There is one important point that arises from the inconsistency between your testimony and that of other high-ranking military and civilian officials. If they have shaded or distorted their appraisal of Soviet military power in order to advance their own service interests, such conduct would be reprehensible.

"Likewise, if you or any other members of the Defense establishment have shaded or distorted your appraisal of Soviet military power to support preconceived fiscal policies for partisan political purposes, such conduct would be equally reprehensible.

"Two conclusions are now inescapable:

"You are considering going against the expressed will of the Congress by refusing to increase B-52 production as promptly as practicable.

"Either you are misleading the American people, or responsible military officials of the Defense Department are misleading the American people, as to the relative military strength of the United States vis-à-vis the Communists.

"Specifically, during the past few days, we have received from you testimony which has differed significantly from previous testimony on such points as:

"Effect of fiscal policies on research and development; "Whether or not the Soviets are out-producing the United States in modern jet aircraft;

"The quantity of bombers and tankers needed for the security of the United States.

"Whether the policy of handling our national security strength is being carried out on the basis of the tradition of past wars, or on the basis of that progress required to wage successfully a possible future war in case the latter was forced upon us.

"This subcommittee has the responsibility of finding out what are the facts with respect to our military defense strength, as against the military strength of the Communists.

"Fortunately, the subcommittee has already made an extensive and detailed record which will largely decide the conclusions reached in its final report."

While Defense witnesses were parading almost daily into the airpower subcommittee room, the Senate Appropriations Committee was busy on the Air Force Fiscal Year 1957 budget. Under the chairmanship of Sen. Dennis Chavez of New Mexico, and with a strong assist from Sen. Willis Robertson of Virginia, the committee took action to remedy in this year's appropriation some of the deficiencies that were coming to light in the airpower hearings. By a narrow thirteen-to-twelve vote, they upped the Air Force FY 1957 budget by a whopping \$916 million. Carrying this fiscal rebuff of the Administration to the Senate floor, the new amount was approved by a forty-eight-to-forty vote.

Several Republican Senators went along with the Democrats on the issue. The House qualified the bill with a provision that the additional funds be used to

speed up production of heavy bombers and jet tankers and other essential Air Force weapons "to the optimum limit of existing facilities." The Representatives also warned that the increase should not be interpreted as an invitation toward waste and loose fiscal procedures.

Some Senators worried that the increased appropriation might not be approved by the President or, if approved, that the Secretary of Defense might impound the funds. But the President signed the bill and fears of impounding action were allayed by Secretary Wilson himself in a letter to the subcommittee chairman.

Striving at the same time to clear up Senator Symington's charge of inconsistent testimony, Mr. Wilson said:

"After a careful review of my testimony, and that of others, I must state that I disagree with the conclusions in your statement. I call your attention to the prepared statement which I made before the subcommittee on June twenty-ninth and my testimony which gave the facts as known to me and represent my views.

"There are two matters which I think it would be helpful to clarify for the benefit of the American people. The first relates to my intentions with respect to the additional funds appropriated by Congress for the Air



Secretary of Defense Wilson begins his testimony before Symington subcommittee with Admiral Radford at his side.

Force. I stated at the hearing, and now repeat, I do not propose to impound the funds, and I propose to carry out the intent of Congress, subject to the limiting factors proposed by the Congress itself and to the recommendations of the Secretary of the Air Force and to my own best judgment as to the security needs of the nation.

"The second point relates to the relative airpower of the United States vis-à-vis Russia. Depending upon how such a question is phrased any one of a number of assumptions could be proven by the best intelligence estimates available. I merely wish to emphasize my belief, based upon evaluation of the facts, that in our over-all air strength we are ahead of the Russians today, and we intend in the future to build and maintain total air strength capable of preserving the security of the US, and as a visible deterrent to wars of any kind."

When queried about whether these funds can be used effectively, General Twining left no doubt that they were needed. While he made no detailed comment on the \$800 million earmarked for aircraft and relative procurement, it was a good bet that a major portion of it would be used to speed production of jet tankers. The \$100 million added to the AF research and development fund was \$50 million less than the Chief of Staff had previously testified could be spent effectively. While this additional \$900 million was obviously a big help in 1957, a bigger money problem lay ahead. Both Secretary Quarles and General Twining have repeatedly warned

the Congress that a sizeable increase over this year's \$17 billion budget would be required in Fiscal Year 1958 if the Air Force goal was to be reached and supported. Secretary Wilson offered the guess that the Air Force's 1958 budget would be increased "from \$1 to \$2 billion," but he warned that there were decisions that would have to come first. One was the increase planned by the Air Force from eleven to seventeen B-52 wings in a proposal that apparently does not yet have JCS approval and Department of Defense sanction. Such an increase in B-52 wings need not mean a jump in the 137-wing program. Rather, it would presumably involve a shift of B-47 wings out of SAC into TAC. General Twining's estimates given on several occasions were that the 1958 funds needed would run something over \$22 billion, and a "flash" estimate by the Air Staff and approved by General Twining set the figure at \$23.6 billion. Both of these estimates go well beyond Secretary Wilson's \$1 to \$2 billion "guess."

The likelihood of the Administration's approving or Congress's voting increases of this magnitude seems remote. For one thing, both Navy and Army budgets are due to increase next year. Flash estimates of all three services add up to a staggering \$48.5 billion, more than \$13 billion beyond the \$35 billion level being talked in both Defense and Congressional circles. Certainly it is doubtful if "savings" of the type made this year could pare this total figure down to an acceptable level.

Indication that some real attempts at reduction were being made came from reports attributed to Admiral Radford's office. These reports indicated some revolutionary cuts in manpower were under study, allegedly running as high as 800,000 men, within the total Defense structure.

Secretary Dulles, in talks with newsmen, gave tacit approval of these cutbacks as a basis for planning. Apparently ignoring the impact these actions might have on the NATO nations, he discussed also the possible withdrawal of American forces from overseas areas, including Europe. He reasoned that the powerful nuclear weapons now coming into our service inventories were sufficient deterrent and obviated the need to continue so-called conventional forces on such a large scale.

If these reported personnel cuts are actually made across the board, it will weigh heavy on an Air Force already burdened with more manpower problems than it can handle. This action would also seal the tomb of the already crippled 137-wing program. The Chief of Staff of the United States Air Force is reported to have said that a budget level comparable to the \$16.5 billion established this year would force him to make a sizeable cut in numbers of wings if we are to keep the force effective.

No one can predict with certainty the course of history. But this much is certain. The true test of military power is no longer solely its ability to achieve military victory. If our deterrent strength dwindles to a point where it can no longer deter a major conflict, then our fiscal experts will be proved wrong regardless of which nation wins.

In the best judgment of our military leaders, this year, 1956, is, or should be, a year of decision. But the real decisions are not being made. They are being shoved behind the door in the vain hope that time, somehow, will not march on, that the clock can somehow be stopped, and that meanwhile the hand of Providence may work a miracle on the perverted intellects of the masters of the Kremlin.

In this year of indecision our national motto would appear to be "Put your trust in God. The price of powder is too high!"—End



Twining (left) chats with Congressman Carl Vinson before reporting on his Soviet trip.

American airmen in Russia

REPORT FROM

By Gen. Nathan F. Twining

AM here, by your invitation, to give an account of my visit to the Soviet Union. As you know, I have already reported to the President and to my superiors in the Department of Defense. This statement is an amplification of a summary given to the President and Department of Defense officials.

The trip was the result of an invitation conveyed to me on May 29 by the Soviet Air Attaché in Washington, Colonel Bachinski. The invitation was extended on behalf of Marshal Sokolovski, Chief of Staff of the Soviet Armed Forces, representing the Minister of Defense, Marshal Zhukov. I was specifically asked to attend the air show at Tushino airport, near Moscow, on the occasion of Soviet Air Force Day, June 24.

It was also suggested that I might visit what were described as "several technical air installations" as well as a Soviet Air Force higher training establishment. The Soviet government, I might add, offered to pay the expenses of my party during our stay in the USSR.

The question of whether the invitation should be accepted was carefully weighed at the highest levels of our government. The decision that I should go was made by the President.

A major consideration in that decision was the desire on our part to find out how far the Soviet government was prepared to go in exposing the operations and equipment of its Air Force and the supporting air establishments. We also felt that these specific purposes would be served by such a visit:

It might provide us with an opportunity for a first-hand appraisal of the present position of Soviet airpower, and also give us more insight into its potential during the years ahead.

It would provide a test as to whether any advantage would accrue to the United States in entering upon a program of reciprocal visits between Soviet military delegations and our own.

Accompanying me were the following officers:

Lt. Gen. Frank F. Everest, Deputy Chief of Staff for Operations; Lt. Gen. Donald L. Putt, Deputy Chief of Staff for Development; Lt. Gen. Thomas S. Power, Commander, Air Research and Development Command; Lt. Gen. Clarence S. Irvine, Deputy Chief of Staff for Materiel; Maj. Gen. Albert Boyd, Deputy Commander, Air Research and Development Command; Brig. Gen. William H. Blanchard, Deputy Director of Operations, Strategic Air Command; and Col. Thomas W. Wolfe, USAF Air Attaché Designate to the Soviet Union. (Colonel Wolfe served as an interpreter for the group.)

Because my day-to-day activities in the Soviet Union

were extensively reported in the American press, I shall not burden you with a travelogue of my eight-day tour. Rather, I shall concentrate on our more important observations concerning those segments of the Soviet air effort that were disclosed to us. My comments will principally cover the aircraft we saw, the two production plants, and the two air-training establishments that were opened to us, as well as certain helpful bits of information we were able to piece together from conversations with Soviet leaders, scanty as these were.

First, the aircraft that were displayed:

We had only two good looks at their planes—once during the big air show at Tushino airfield and again at Kubinka airfield, where we were shown sixteen aircraft parked for ground display.

At Tushino they brought out many of the operational aircraft types already known to us. In this air show, however, we saw several modified and presumably improved versions of these aircraft, as well as four new types. These new types were a turboprop assault transport somewhat similar to our Fairchild C-123 and three experimental fighters having some features of delta-wing design.

Except for a few aircraft which put on a display of aerobatics, the air procession made only one sweep past the reviewing stands at about 400 feet altitude and at a distance varying from one-quarter to three-quarters of a mile. The weather was poor; rain fell intermittently during the exhibition; and a relatively low ceiling prevented the organizers of the show from going through with a promised demonstration of a sonic boom. In spite of these handicaps, the show was well-timed and the quality of airmanship was good.

An interesting and somewhat unexpected aspect of this particular show was the stressing of defensive, rather than long-range offensive types. For instance, the largest formations were composed of defensive fighters of the Farmer and Flashlight categories. By contrast, they brought out only seven heavy long-range bombers. Three of these were Bison heavy jets and four were turboprop heavy bombers of the class known to us as Bear. On previous occasions the Soviets have paraded larger numbers of both types.

Among the sixteen aircraft chosen for ground display at Kubinka airfield were most of the types that had appeared in the Tushino fly-by. This time, however, they left out the new assault transport that I have mentioned, and the three delta-wing fighters. But there were now included three types that had not appeared in the air parade. One of these was a new twin-engine light jet bomber of clean aerodynamic design—the Soviet briefing officer described it as supersonic. Another was a twin-engine ground-attack

General Twining saw fly-by of Russian Bear, flanked by Fresco fighters, at Tushino.

jet bomber said to have protective armor plating. The third new type was a turboprop naval torpedo bomber hung with a variety of external gadgets and armament.

MOSCOW

Neither we nor the other visiting air delegations (of which there were twenty-eight) were invited to enter these aircraft nor to move really close to them. The exhibits were lined up, wing-tip to wing-tip, on an inactive runway. We were taken past them in a motor procession at a distance of about twenty-five yards and at a speed of about five miles an hour. This gave us time for only a quick look at each one.

There was one deviation from this procedure. General Everest and I were riding somewhat behind the main group. As we crossed in front of the TU-104 jet transport, Marshal of Aviation Rudenko, who was our escort, ordered his driver to stop. On his invitation to inspect the interior, we got out of the car and climbed aboard for a look around. There is no mystery about this particular transport. It had earlier been exposed to close Western observation at London and Geneva.

Altogether, in the displays at Tushino and Kubinka we counted ten aircraft that either had not been publicly displayed before or which represented modifications of previously identified designs. Among the latter we recognized an altered version of the latest operational fighter in the well-known MIG series, the MIG-19 Farmer. There were also two revised models of the Soviet all-weather fighter Flashlight, The designation of this aircraft is the YAK-25.

Of the new aircraft brought into public view on these two occasions, the most important, in the judgment of my party, was the twin-jet and allegedly supersonic light bomber now designated by us as the Blowlamp. This aircraft appears to be the replacement for the IL-28 (Beagle). You will doubtless recall from my earlier testimony before this Committee that Soviet production of the IL-28 is estimated in the thousands; and while it is now being phased out of Soviet combat units, it is being added to the forces of other nations of the Communist bloc.

The Kubinka excursion also yielded an example of a hook-up for aerial refueling. Between the wing tips of two Badger jet medium bombers on the ground extended a fifty-foot length of four-inch hose. This bore little resemblance to any of the devices we have developed,

It was obvious that the Soviet air leaders are giving a good deal of thought to the air refueling problem. A Soviet air general (Ponomariev) informed us that the Russian Air Force is working on what he described as two different approaches—a flexible system, and a "rigid" system.

From the remarks of various Soviet air officers we gained the distinct impression that they are wide-awake to the advantages of aerial refueling; in fact, they cited figures on the range extension made possible by this technique. It is, of course, obvious that an in-flight refueling capability would be an essential Soviet objective, and we have no doubt that they are taking full advantage of advances that are being made in this field.

Over-all, the Kubinka display was interesting not only for what it showed, but equally for what it failed to show. Completely missing from the array of exhibits were any guided missiles, even of the most elementary kind.

There is, of course, ample evidence that the Russians have such missiles. But I must report that throughout our stay in the USSR our hosts maintained a veil of secrecy around their activities in this field of weapons and could not be drawn into technical conversations about them.

Limited and controlled as were the displays at Tushino and Kubinka, they were further informative because they gave us our first fairly close view of a number of aircraft which previously had been seen only at a distance. These included the Bison jet heavy bomber, the Bear turboprop heavy bomber, the Badger jet medium bomber, and the Farmer and Flashlight fighters.

A final evaluation of the quality and performance of these aircraft has not yet been made. In the meantime, however, several comments seem valid:

 On the basis of the aircraft we saw or were told about, the Soviet Air Force is engaged in the development of a surprisingly wide variety of aircraft.

 It was the judgment of my group that the designed configuration of most of these aircraft reflected a high level of scientific and engineering talent. They were proof that Soviet designers are now pioneering on their own in the field of modern aircraft development.

• It was further our judgment, at least on the basis of the aircraft shown us, that despite the undeniable strides made by Soviet designers, they have not outdistanced us. Nothing we saw could honestly be described as being superior to the best US aircraft in comparable categories. In saying this, I must note, however, that in certain areas—notably the development of a turboprop type of bomber—they have made a large effort in a direction that, for reasons of our own, we did not choose to take,

• The three experimental delta-wing fighters shown at Tushino appeared to us to need still further tests and development before they can be put into series productoin. It was also our general conclusion that in the latest operational types as well, Soviet designers are having trouble in achieving stability at high speeds. This was evidenced, among other things, by their extensive use of wing "fences"

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and foils to adjust the stream of air over wing and control surfaces.

Nevertheless, despite the absence of some engineering and design refinements familiar to us, the widening variety of aircraft already in the Soviet operational and experimental inventories is clear evidence of a broad understanding of the state of the aeronautical art and of Soviet determination to advance therein on a very wide front.

I shall now report on what we saw of the industrial side of Soviet aviation. On the fifth day of our visit my group was taken to two factories—first to an aircraft engine facility (Plant #45), and then to an airframe assembly facility (Plant #30), both in the Moscow area. As it turned out, the engine factory is the oldest now producing in the USSR and the assembly plant is turning out a standard-type transport. For us to be taken to these somewhat outmoded production sources after being shown some of the latest Soviet products seemed to us strangely inconsistent. This was mentioned to Tupolev, the Soviet Union's leading aircraft designer. His reply was, "You have to keep something in your pocket, you know."

At the engine plant we were given a view of all the important stages in the manufacture of a centrifugal-flow jet engine that had been adapted by the Soviet designer Klimov from the British Nene. This particular engine, though no longer found in their latest aircraft, is still being used to power the IL-28 bomber (Beagle), the MIG-15 (Fagot), as well as the MIG-17 (Fresco). Considerable numbers of these aircraft still remain in the Soviet com-

bat inventory.

However, our look at even this relatively obsolescent engine was worthwhile for the reason that it enabled us to see the engineering processes used by the Soviets to get the maximum power potential from an engine of Western design. We saw also how they had applied a power-

adding afterburner to this particular model.

Several points about this factory were extremely interesting to us. From our guides we learned that about 1948 it had been converted from the manufacture of agricultural machinery to jet engine production. They also said that during what they called the War-by which I presume they meant the Korean war-this one plant produced more than 10,000 VK-1 (Nene-type) engines for the MIG-15. This high output of quality engines was achieved in spite of "job shop" production methods and, by our standards, fairly simple tooling. When we were there, the plant's VK-1 line appeared to be operating at about fifteen percent of capacity. We were given to understand that the plant is to be retooled for the manufacture of turboprop engines. Worker discipline, the production scheduling and the quality of output impressed my people as being good. We were told that more than twenty percent of the 3,000 workers on the engine line had been employed in the plant more than ten years.

The airplane assembly plant that we saw was producing a twin-engine transport, the IL-14. In configuration and performance this airplane is about midway between

our DC-3 and Convair.

Although our guides claimed this source was putting out two IL-14s a day, our own judgment was that the true daily rate was closer to one. In any case, there were indications of a tapering-off in the operation, and we were informed by a production official that the plant is to be converted to the manufacture of Tupolev's four-engine, turboprop transport, the TU-114.

We were told that the work force totaled 5,000. The experience level seemed high: the production scheduling



Wide World Photos, Inc.

This experimental jet with modified delta wing was among new Soviet planes shown to US military air experts.



Wide World Photos, Inc

Gen. Nathan F. Twining (right) was guest of Georgi Zhukov (center) and Nikita Khrushchev at dinner party in Moscow.

looked good, as did the quality of the product, despite the high proportion of handwork.

This aircraft plant produces under its own roof some eighty-five percent of the airframe, whereas in the US assembly plants the figure is about sixty percent. We concluded that owing to such factors as lack of automation and of high-production tooling and presses, the production per man-hour is considerably less than that achieved in the US.

Three things about Soviet production methods caught the eyes of my people. First, the assembly jigs were light and simple. In contrast with the American practice of employing forgings or extrusions, welded sections were used for landing gear and similar structures. Second, curved sections were fabricated from sheet aluminum on simple hand-operated light hammers, while more difficult sections were formed by air-activated, hydraulic stretch processes managed by simple hand control. Third, the

wing and fuselage sections were built up by the riveting together of smaller parts, as with the British Canberra.

The housekeeping practices of both the engine and airframe assembly plants were definitely below United States standards. While there was an absence, at least in these plants, of the huge presses and other high volume automatic gear that are commonplace in our industry, this condition should not be taken to mean that they are backward in the new industrial processes or in their appreciation of the higher labor productivity possible with such equipment. The two plants which they deliberately chose to show us are among the oldest in the Soviet aircraft industry and are not representative of the more modern production facilities that since have been added. Still, there is a good reason to believe, even on the basis of these two examples, that the Soviets possess in high degree the ability to apply mass-production processes and techniques to the manufacture of airframes and jet engines.

That the Soviets chose to take us to a plant devoted to the output of transport aircraft, rather than to one making combat aircraft, seemed to us an action deliberately designed to reinforce their frequently reiterated theme of being more interested in building transports than bombers. In this connection, it is worthy to note that Soviet officials made a big point of the claim that they were already operating the TU-104 jet transport (Camel) over

regularly scheduled routes.

In both the engine and assembly plants we were told that one-third of the current effort is devoted to the production of agricultural implements. We saw none of this work, although it may have been going on in other parts of the plants, into which we were not invited. I must also add that neither tour was calculated to allow us to add importantly to our knowledge of the work that the USSR is carrying on in the manufacture of engines and airframes for more advanced combat aircraft.

Turning now to the training side of the Soviet air establishment, I will note by way of preface that we had looked forward especially to this part of our schedule.

The final itinerary given us just before starting out from Washington listed visits to two types of higher training institutions, one dealing with tactical and operational matters, and the other with technical and engineering studies. The famous Zhukovskii Air Engineering Academy in Moscow, founded in 1918 at Lenin's direction, was nominated by our hosts as an example of the latter field of specialization, and the Monino Air Academy, also in Moscow, was chosen for the former. Being well aware of the very rapid rate of progress made by the Russians in the air sciences and technologies, we were hopeful of gaining from a study of these academies an even deeper insight into their air thinking than could probably be elicited from a passing view of their heavily screened production and design activities.

In some respects, the day we spent at the Zhukovskii Academy was the most illuminating single facet of the entire visit. The student body is drawn directly from the officer ranks of the Soviet Air Force; and in standpoint of physical size and the breadth and depth of its curriculum this Academy is unique among the world's professional military institutions. The course lasts five years; the student enrollment, we were informed, is 2,500. The age range for entrance is twenty-four to thirty-two years and candidates are required to have at least five years of prior service with the Air Force and the rank of first lieutenant to major.

Several things about this engineering academy impressed us. One was the obviously good quality of the instructors. In their brief discussions with us they showed they knew their business. Another interesting point was the fact that the Soviet Air Force is able to spare so many promising officers for so long a period.

A third thing that impressed us was the equipment available for training. It was very good, there was a lot it, and it was varied. My technical experts were surprised that the Soviet Air Force possessed the resources to put so much specialized equipment at the disposal of a training institution. They had an unusually fine collection of laboratory cameras for very high-speed photography, and their metallurgy department would compare favorably with the highest United States standards.

To my group the most unexpected of the advanced facilities encountered-again, in an institution of this kind -were the wind tunnels. A Mach Three wind tunnel was actually demonstrated to us. The aircraft model used was a true delta design. From the shock waves produced when it was subjected to the ultrasonic air stream it was clear that this tunnel was a bona fide Mach Three testing device.

It was something of an eye-opener to find such a machine in a military training institution. We also noted in the wind tunnel laboratory a variety of delta test models. These advanced models indicated that Soviet research studies are reaching beyond the limits suggested by the intermediate delta prototypes flown at Tushino. There was another wind tunnel at this school which the Russians said could produce Mach Five conditions. This was not put into operation.

By comparison with these ultramodern features, the electronic department was anything but revealing in terms of the work they may be doing in this important field. Such school equipment as was shown to us clearly belonged to an earlier stage of Soviet electronic development. For the most part, it appeared to have been copied from the West.

In another department of the Zhukovskii Academy we came upon several cutaway models of earlier versions of

Soviet axial-flow jet engines.

These were naturally of interest to us. Engines of the axial-flow type represent, as you know, a more advanced stage in the engine art than do those of the centrifugal type, such as the one we earlier saw in production at Plant 45. Our brief inspection of this school exhibit was as close as we ever came to Soviet work in the axial-flow engine field. Although the prevailing direction of Soviet engine development for their latest operational aircraft lies clearly in the axial-flow field, we saw nothing of this work.

However, the designer Tupolev disclosed to us in conversation that their Bison heavy bomber is equipped with axial-flow engines. From what we know about big bombers, we were sure that the Bison's engines are larger and more powerful than any on display at the Academy.

This completes my observations on our day's tour of the Zhukovskii Academy where the Soviet Air Force trains its most promising talent in the air sciences and engineering. I should add, parenthetically, that this academy is but one of an extensive network of institutions, both within and outside the Soviet Air Force itself, in which scientists and technicians are either being trained or are carrying on research activities in support of the Soviet air effort.

Our exposure to the Soviet air training establishment was concluded with a visit to a second institution where young officers are given advanced schooling in the operations, tactics and doctrines of air warfare. This is done at the Monino Air Academy. Here the student-candidates are required to have, along with the necessary intellectual capacity to pass a qualifying examination, several years' experience with tactical units. The course lasts three years.

(Continued on following page)

We asked how many students were in the school, but no satisfactory answer was supplied. The physical plant, excepting for the somewhat run-down airfield that was adjacent to it, gave a favorable impression.

Among the classroom exhibits was a training table layout demonstrating an air attack upon a naval carrier formation. In another classroom devoted to the study of fighter tactics, there were on view models of several US aircraft including the B-52, the F-100, the F-101, the B-66, as well as a model of the US Navy carrier Franklin D. Roosevelt. There was evidence among the displays that part of the curriculum deals with the tactics of nuclear warfare. At Monino Academy we gained a limited insight into some of the areas of training that are manifestly of interest to the Soviet Air Force, However, our attempts to obtain detailed comment on the quality of training and on current doctrine and tactics were met with non-committal answers which fended off further discussion.

This completes my account of the few elements of Soviet airpower that our party was permitted to see. Apart from the scheduled visits to installations exclusively of air significance, we were taken on a brief tour of the atomic electric power station southwest of Moscow. This plant has become a Soviet showpiece open to numerous foreign visitors. We hoped that this side trip might provide a chance hint of some of the military applications of the Soviet nuclear energy program. Instead we got only the standard Soviet discourse on their devotion to the "peaceful uses" of atomic energy. While this visit, therefore, contributed nothing directly to our professional appraisal of Soviet air weapons, it did provide a useful addition to our over-all impression of Soviet technological capability.

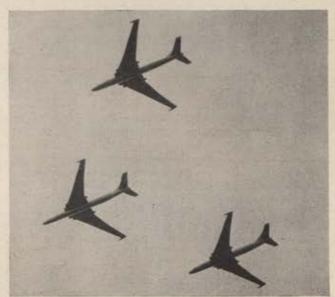
In weighing the observations that I have put before you, it is important to bear in mind the conditions imposed upon us by our hosts.

Let me distinguish, at the outset, between an outward display of hospitality on the one hand, and, on the other, a conscious and calculated concern for the pursuit of Soviet self-interest. Though the welcome mat was laid out with a flourish, a careful hand was kept on the door.

Our Russian hosts were certainly cordial to us. They went out of the way to make sure that we were comfortable, and from their attitude it was plain that the Soviet leaders, in showing us what they chose to show, felt they were being fairly open-handed. Certainly by contrast with their accustomed habits of secrecy, they did open the door -if only a crack. In reality, however, they gave us much less information than is openly available to them about our own Air Force and defense preparations. What we saw and what we heard was, for the most part, only what the Soviets elected to reveal in accordance with their current world propaganda line. That line-and they dwelt on it continuously while we were there-is meant to persuade the Free World that their military preparations are essentially defensive in nature and that the much-advertised Soviet program for reduction of armaments should be accepted at face value.

Illustrative of the solid front between the Soviet political and military leaders in trying to get this point across was an impromptu exchange between Marshal Zhukov and one of my group. Commenting upon the small number of heavy bombers that had flown at Tushino, a member of my party noted, in effect, "Why so few? You are building these aircraft in quantity, aren't you?" Zhukov's reply was, "Oh, they are in production, but we are a peaceful people. We do not want to boast about our offensive weapons and offensive capability."

From the carefully controlled nature of our tour, it was



Tupolev-designed Russian Bison over Tushino airport.

manifest that the Soviet leaders are still being wary about revealing much of their military power. So deeply rooted are the habits of secrecy and so all-pervading is the apparatus of discipline that it proved impossible for us to carry on even the most elementary professional discussions with our Soviet opposite numbers. The guides who escorted us monitored our conversations with plant officials and other Russians with whom we came into contact; and whenever the discussions seemed to be getting off a general track, they were quick to interrupt. These guides also kept a watchful eye on members of our party and allowed no one to linger behind for a longer look at some object of interest.

At the same time, it is worth noting that while the Soviets steadily discouraged any unusual show of curiosity on our part, they made no effort on their side to pump members of our party for information about our AF.

In addition to the language and security barrier that inhibited professional discussions, they let us see their operational aircraft and prototypes under conditions that permitted only the most cursory observation. They allowed detailed inspection only of those equipment items about which they had reason to suppose we already possessed rather complete information, or which had no important relationship to their very long-range offensive air capabilities.

Bearing in mind the limiting conditions under which our brief visit was conducted, let me now sum up the results and findings.

With regard to appraising current and potential Soviet air strength, it must be said in frankness that we obtained no new information of significance.

In such important matters as long-range bomber production, defensive and offensive guided missile systems, and military applications of nuclear energy, as well as details concerning operational forces, we met a blank wall. Nevertheless, the inspection of their aircraft and equipment, limited as it was, naturally proved illuminating to the professional experts in my party. In this respect, our trip was profitable.

Furthermore, our contacts with key Soviet military figures permitted the members of the group to form some opinion as to their professional competence. We met, for the first time, such senior Soviet air commanders as Mar-



MI-4 helicopters were demonstrated at Tushino airport along with other aircraft already known to US visitors.

shals Zhigarev, Rudenko, Sudets, Vershinin, as well as lesser known officers. Our general impression was that the command element in Soviet aviation is made up of tough, aggressive, resourceful leaders. We also met such leading designers and production men as Tupolev, Lyulka, Arkhangelsky, Tumanskii, and Klimov. These men appeared to be enthusiastic, vigorous, and confident, but not averse to learning what they can from work being done outside the Soviet Union.

There was much evidence during our trip that the prestige of the Air Force in the Soviet Union has risen, and that both air force commanders and those engaged in the design and production of aircraft enjoy high esteem among top government leaders.

Besides our objective of attempting to gauge the position of Soviet aviation today, we had in view the important task of getting a feel for its potential in the years ahead. By way of general conclusion, I feel that our visit substantially strengthened our previous assessments that the USSR, while certainly not abreast of us today, can and is progressively narrowing the technological lead of the West generally and of the United States in particular.

The factors supporting this judgment include their emphasis on a thorough technical training of a large number of carefully selected personnel; the widening variety of aircraft under development; their ability to squeeze the maximum potential from a jet engine of western origin and at the same time to develop powerful new engines on their own; and the rapid rate of progress they have shown during the last few years in the research and development field.

Furthermore, given the heavy emphasis which the Russians are placing upon the forced development of a new technical generation, beginning with primary education and carrying through basic research and engineering development, we must in prudence reckon on the possibility of their achieving a scientific breakthrough and consequent technological surprise in new weapons.

You will recall that at the beginning of this statement I mentioned that among our purposes in going to the Soviet Union was to take soundings as to the desirability of future reciprocal military visits. Obviously, any decision on this complicated matter involves numerous political considerations which do not fall within my province.

This much I can say: First, Soviet officials at all levels constantly repeated the hope that our visit would be the first of a series of encounters leading to wider exchange. They plainly desire an early invitation to pay a reciprocal visit to the United States. Second, the nature of the Soviet overtures indicated a definite desire on their part to establish a pattern for the exchange of military information on their terms as a possible alternative to the President's aerial inspection proposal, which they continue to reject.

Mindful of our experiences in this first venture, I set forth in my report to the President those conditions for the control of reciprocal military visits which I feel should apply, in the event our government decides to continue such exchanges.

Finally, I would like to deal with an apparent misunderstanding which arose out of certain general statements by me at a press conference following my report to the President at Gettysburg. The crux of the matter is whether what I saw and learned in Russia has caused me to change the position I had previously held concerning the relative air strengths of the United States and the Soviet Union.

As the members of this committee will readily appreciate, if anything is certain in this uncertain world, it is that air forces, in common with other institutions, do not stand still. Time and circumstances—and the circumstances include both what we do and what the Soviets do—will undoubtedly bring changes in any given evaluation of the complex question of relative air strength.

So far as this visit is concerned, I want to make it unequivocally clear that our findings do not justify any hasty action to write down, or for that matter, to write up our previous assessments of Soviet airpower. In the first place, as I told the President, the opportunity accorded us during our visit to see and ask questions about Soviet air strength was, in my judgment, much too limited to provide a basis for any substantial revision of previous estimates. These assessments—the substance of which I gave to this committee in February—rest on a much broader body of evidence than could be acquired on such a brief and carefully controlled visit as mine.

In the second place, as I have already pointed out in this account to you, our visit did have the positive effect of strengthening our previous judgment that the rate of progress and improvement in Soviet air weapons—backed by a massive scientific and industrial effort—is such as to give us cause for serious thought about the future. As regards relative quality of aircraft at the present time, we can be reassured that we have not lost our lead. This was our judgment before we went to the Soviet Union; it still stands. We must protect this qualitative lead by a continuing heavy investment in research and development. I am convinced that our present spending on research and development is not only fully justified, but that increases in this area are warranted.

As to quantities of aircraft, we saw nothing during our short stay in the USSR which would lead us either to raise or to lower our previous estimates of Soviet production capabilities, or of the numbers of aircraft which they have on hand. It must be noted that nothing was revealed to us in the important area of guided missiles.—End

General Twining and his party were in Russia from June 23 until July 1. After his return, the AF Chief of Staff reported on his trip to the Armed Services Committee of the US Senate. The above material is the summary of this report, as subsequently released by the Senate committee.



Joanne Alford, "Miss Airpower of 1956," of Baltimore, Md.

Miss Joanne Alford is 1956's

MISS AIRPOWER

Queen of AFA Convention is a pilot and an engineer



Joanne, in cockpit of a T-33 jet.



Helen Marcia Daines, "Miss Airpower of Utah, 1956," was one of the finalists.



Jan Markstaller, formerly "Miss Portland" (Ore.), was the other runner-up.

ISS Joanne Alford, a twenty-four-year-old pilot, and an engineer for the Glenn L. Martin Company in Baltimore, was named AFA's "Miss Airpower of 1956" after a nation-wide search for the girl with the right combination of qualifications. Tiny (5' 2½", 100 lbs.) Miss Alford reigned at AFA's Tenth Annual National Convention in New Orleans August 1-5, where one of the highlights was her appearance at the Ladies' Fashion Luncheon in her "Airpower Gown," especially created for her by well known New York fashion designer Ben Reig.

well known New York fashion designer Ben Reig.

Though a "Miss Airpower" has been featured at the national conventions for the past several years, this is the first time she was chosen in a nation-wide contest in which nominees had to hold a valid pilot's license, (They also had to be single and between the ages of eighteen and thirty.) After preliminary eliminations, the three finalists (pictures on this page) were flown to New York City on July 8. There, after the three made several appearances on television shows, Joanne Alford was announced as the winner, by Arthur Godfrey on his network television program Tuesday morning, July 10. The judges were: Maj. Gen. Roger J. Browne, Commander of the First AF; radio and TV star Jinx Falkenburg; Candy Jones, nationally known model and fashion executive; and Gill Robb Wilson, President of AFA. In his telegram to Mr. Godfrey announcing the winner, Mr. Wilson also extended an invitation to the two runners-up to accompany Miss Alford to New Orleans as special guests of AFA.

Brown-haired, brown-eyed Joanne was born in Jacksonville, Fla., and attended high school in Baltimore. She received her B.S. degree in engineering from Purdue Uni-



Olivia Twining, daughter of General Twining, reigned at 1953 Convention.



"Miss Airpower, 1954"—Ann Griffis, daughter of Brig. Gen. Loyd Griffis.



AF flight nurse Capt. Gloria G. Sauls held title at San Francisco in 1955.

versity in 1955, has been a pilot since 1951, and has logged about 200 hours of flight time. The daughter of Helen Alford, well known Baltimore singer, Joanne was nominated by AFA's Baltimore Squadron and the Maryland Wing of AFA; Hq., Air Research and Development Command; and Baltimore's Mayor Thomas D'Alesandro, Jr. After her graduation from Purdue, she went to work for Martin as a service engineer. Early this year she became a materials and process engineer in Martin's Engineering Materials Section.

As "Miss Airpower," Miss Alford was flown to San Francisco late in July to act as official hostess for AFA's Earl

T. Ricks Memorial Jet Flight by Air National Guard pilots from San Francisco to New Orleans. She arrived in New Orleans in time to greet the pilots as they arrived.

Previous holders of the title, shown above in their especially designed "Airpower Gowns" were Olivia Twining (1953), daughter of AF Chief of Staff Gen. Nathan F. Twining, in a dress designed by Oleg Cassini; Ann Griffis (1954), daughter of SAC's Surgeon, Brig. Gen. Loyd E. Griffis; and flight nurse Capt. Gloria G. Sauls (1955), in a gown designed by Ceil Chapman. Some of the other nominees for this year's Miss Airpower title—all pilots—are shown below.—End

SOME OF THIS YEAR'S 'MISS AIRPOWER' CONTESTANTS



Madelyn Joyce Case Wichita, Kan.



Patricia Louise Coffer Yuba City, Calif.



Florence Dauenhauer Santa Rosa, Calif.



Romona Rolfson Dallas, Tex.



Marilene Shearer Toppenish, Wash.



Nancy Shortreed Pittsburgh, Penna.



Joann Van Arkel Des Moines, Iowa



Jeanne Weydert College Park, Ga.

fiftieth anniversary of powered flight, the Association was the co-sponsor of a four-day celebration on the sandy dunes of Kitty Hawk, N. C., at the monument marking the scene of the Wright Brothers' historic achievement.

That year, too, saw the beginning of a new and ever deepening relationship between the AFA organization and the Reserve components of the Air Force. That year, the Air Reserve Association, the oldest Air Reserve group in the nation, was merged into AFA. Its members became AFA members, and the existing Executive Board of ARA became the National Air Reserve Council of the Association.

This was followed a few months later by the formation of AFA's Air National Guard Council, composed of Air Guard leaders from across the country. This marked the start of a new era in the relationship between the Air National Guard and the Air Force Association.

AFA's close association with the Air Guard was enhanced by the understanding and enthusiasm of the late Maj. Gen. Earl T. Ricks, then chief of the Air Division of the National Guard Bureau. In one of his last public appearances, General Ricks told the 1953 Washington convention, "I know of no other group closer to the pulse of America's interest in aviation than the Air Force Association."

General Ricks died shortly thereafter, but his memory lives on in AFA's Earl T. Ricks Memorial Trophy, awarded annually to the Air Guard pilot who tops the field in a flying proficiency event. And one of AFA's newest squadrons, in New Orleans, has been named the Earl T. Ricks Memorial Squadron.

One of the most moving events in Air Force Association history was the farewell address, to the nation he served so well, of General Hoyt S. Vandenberg, former Air Force Chief of Staff, during the 1953 convention in Washington. His remarks were made in accepting Air Force Association's "Man of the Year" award. This was his last public statement. General "Van" died seven months later.

That year the Association saluted General Vandenberg for having "courageously fought for the development of the airpower concept."

In accepting the award, he told his fellow members of the Association:

"You and I are animated by a common faith arising from shared experiences. That you, my one-time brothers in arms, fellow-toilers in the vineyard of the airpower idea, should do this for me now, when there are so many others more deserving of the honor, makes me humble and also proud. . . . Now, in this splendid gathering I feel acutely the continuing sense of kinship, the common purposes, the shared sense of responsibility for the nation's security. Whatever you may undertake, rest assured of this: I stand ready to join you and to help in any way I can. . . ."

Just as the Association had officially represented the veterans of the Air Force at the Arlington services for General Arnold in 1950, so only four years later it represented Air Force veterans at the services for General Vandenberg.

Memorial Day observances early became a tradition in the Association, nationally and locally. Each year, on Memorial Day, AFA holds special services at the grave of General Arnold as a salute to all Air Force men and women who have given their lives for their country. In 1955, during its national convention, AFA commemorated the tenth anniversary of V-J Day with impressive ceremonies in Golden Gate National Cemetery.

That huge event ended a series of meeting in San

Francisco which led responsible newspapers to editorialize in terms that bring justifiable pride to all who have followed Hap Arnold's big idea through the dark days of survival meetings to the crescendo of the tenth anniversary reunion in New Orleans.

Said the Portland Oregonian, after viewing the Air

Force Association in convention last year:

"This lusty and still-growing organization, backed by the grass-roots power of local units all over the nation, henceforth will have great influence in the shaping of America's military picture. . . . AFA is young, vigorous and full of burning zeal. Its leaders have wisely avoided any dilution of its influence by steering clear of political or social issues."

Said the San Francisco Call-Bulletin:

"AFA is playing an important role in keeping the whole world at peace. . . . American airpower is what it is today to a large degree because of the constant efforts of the Association to awaken everyone to the vital importance of air supremacy. . . . The work of the Air Force Association in calling attention to this danger, and in striving to keep American air strength up to par, thus is not only a protection for the people of the United States, but for the peace of the world as well."

The many Jet Age Conferences of the past year, bringing a new insight to the Air Age in communities across the country, are typical of Air Force Association in its tenth year of operation, and typical of the broad scope of its airpower program. Uniting all elements of aviation, and conducted in professional style, these conferences represented the work of volunteers motivated by the firm belief that the airpower educational job must be done if the nation is to meet the challenge of the times.

Typical, too, because the man who stimulated these meetings, and served as the keynote speaker at most of them, was AFA's national president—Gill Robb Wilson—a volunteer himself who has traveled more than 60,000 miles on his own time and money for Air Force Association in the past year.

This one element—voluntary and unselfish service stands out as we mark some of the milestones in Air Force Association's first decade.

Only a full-fledged history of AFA—and this is no attempt at that—could adequately report the names of thousands who have done the airpower job on Main Street,

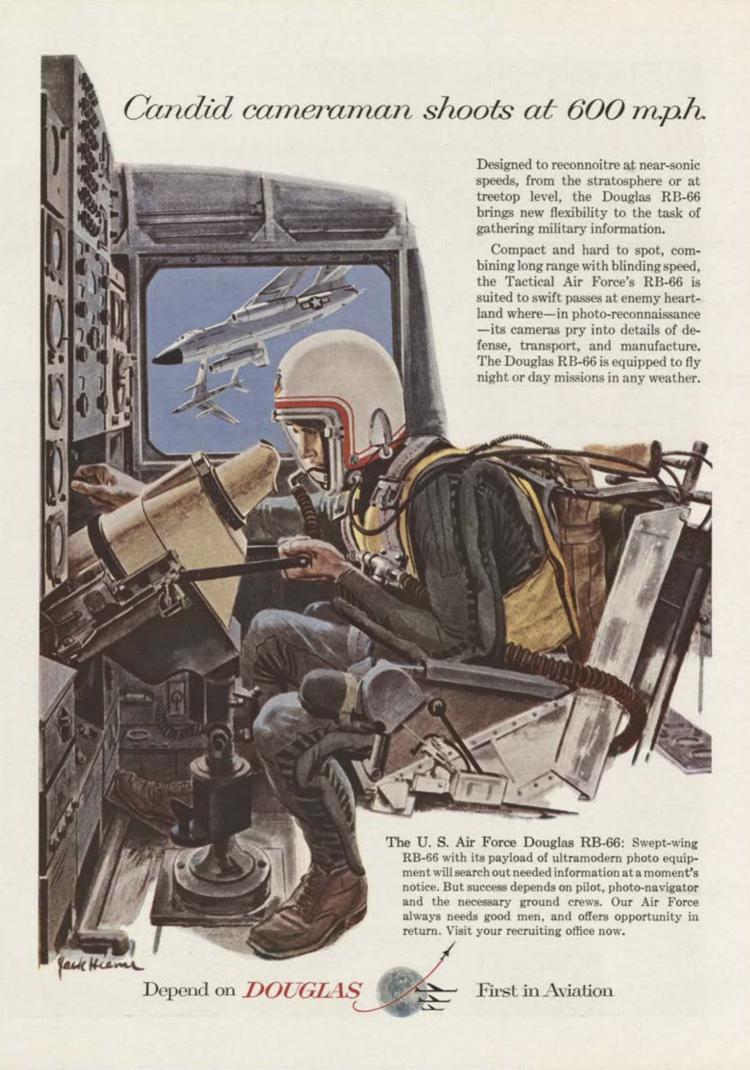
In its first ten years, the Air Force Association has had national leaders—and outside supporters—of great stature. It also has had a large corps of volunteer works, at community and state levels, who together form the lifeblood of the organization.

These groups of individuals have together fulfilled the definition that AFA is "an independent, airpower organization with no personal or political axes to grind."

Beyond that, the Air Force Association has steadily broadened its goals and its activities to the extent that it seems to be developing into—as the Jet Age Conferences of the past year have indicated—an organization which unites virtually all major elements of aviation.

AFA's fraternal interest in the Air Force is deep. It is exceeded only by its interest in the total national security picture. Looking ahead, if a single military service, as advanced by AF leaders in the past year, becomes Association policy—and national policy—the Air Force Association seems to be philosophically capable of emerging as the Air Association, truly representative of all elements of aviation—military and civilian.

Whatever the future, no one can deny that Hap Arnold's big idea has taken a big ride in its first ten years.—End







Which comes first: The EAGLE or the EGG?

Tomorrow's eagles—jet planes and guided missiles are being conceived by fertile minds of aeronautical engineers and designers who are charged with the task of keeping America air-ready.

These projects embody totally new concepts of flight. For these eagles, the eggs have to come first.

And each hatchery must, of necessity, be shrouded in secrecy.

There can be no open and free exchange of ideas lest a leak aid a potential enemy. That makes the mission of these men in the secret drafting rooms doubly difficult.

We have found, at Goodyear, through research and pioneering—new ways and means which can render invaluable assistance to these planners.

We have, in our Aviation Products Division, men with proper security clearance who can bring to these engineers firsthand facts on developments which may advance the flight-test date of their project by months or as much as a year.

These men, for example, are specialists in fuel problems—can tell qualified personnel of recent Goodyear developments which bring a new margin of safety to explosion-prone propellants, new ways of handling and stowing today's fantastic new fuels.

They can reveal new Goodyear advancements in high-temperature problems—dealing with the effects of supersonic speeds on wheels, brakes and fuel systems.

They can explain new developments in defeating ice and sleet new techniques in shock absorption—new high-speed tires—studies of atomic radiation on tire compounds new recovery systems for missiles—facts on fabrics which can do wonders for design problems.

We suggest to these designers and engineers that they call in the Goodyear man.

His assignment is to "see what the boys in the back room will have." He is equipped to deliver downright revolutionary results. Goodyear, Aviation Products Division, Akron 16, Ohio, and Los Angeles 54, California.







See our Products Display at Booth 100, Air Force Ass'n. Convention Municipal Auditorium, New Orleans

Scramble!

A familiar word is fast acquiring a new meaning. Scramble!
... unidentified aircraft. It sums up the alertness of our air defense. It represents our greatest safeguard against invasion. To the companies that manufacture our jet aircraft, another name now represents the highest standards in aircraft components: Kelsey-Hayes.

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PRODUCTS FOR THE AVIATION INDUSTRY: Accessory Gear Assemblies, Actuators, Transmissions, Computers, Controls, Bomb Hoists, Gun Turrets, Radar Tracking and Scanning Assemblies, Power Recovery Units, Compressor Rotors and Turbine Sections, Blades, Buckets, Vanes.

What's New With RED AIRPOWER

This month we are starting what we hope will become a regular feature of AIR FORCE—a summary of the latest available information on Soviet air intelligence. Because of the nature of this material, we are not able to disclose our sources, nor to document the information beyond the fact that the sources are trustworthy.

→ Comet Missiles

Russia has a new series of air-to-surface missiles designed especially for use against shipping. They are designated Comet 1, 2, 3, and 4.

The new family of missiles was developed by a small group of German electronic experts formerly with Askania and Telefunken (wartime electronic firms now in East Germany) who are still being compelled to work at an electronics center near Moscow.

Comet 4 has a range of ninety-three miles. For the first sixty-odd miles, the missile follows a beam relayed ahead of the aircraft from which it was released. For the last one-third of its journey the missile responds to radar echoes from the target. The initial radar signal is sent out by the mother plane, and several small receivers aboard the missile pick up the signal, the frequency of which is continually shifted to prevent jamming by the ship. The missiles' receivers are attuned to shift with each change in frequency.

Ack-Ack School in Leningrad

A new school for anti-aircraft artillery officers from the Red Army and satellite forces has been opened in Leningrad within the past year. This fact became known recently when a group of East German officers of the socalled National People's Army left East Germany to attend the courses in "new weapons" at the school.

* 'Winged Infantry'

The Russians don't divide their armed forces into three packages—army, navy, and air force—as we do in the US. Army, navy, and air force over there are divided into several forces which report independently to a large General Staff holding sway over all. Latest of the many forces reporting to the General Staff is the so-called "Winged Infantry," or helicopter force, It is being equipped with large, twin-rotor YAK-24 helicopters (which first appeared on July 5, 1955, Soviet Aviation Day) to transport ground troops and small artillery units across radioactive battle-fields, if such proves necessary.

→ IL-14 Production in Satellites

The twin-engine IL-14 (designated Crate by NATO) is now being produced under license in Germany and Czechoslovakia. The medium-range, piston-engine transport is assembled at the People's Own Industry Works at Dresden in East Germany. About five IL-14s will be assembled in the East German Peoples' Republic this year from Russian parts. Next year some fifty-three of the aircraft are to be built from parts made right in East Germany; thirty-two more are scheduled for 1958.

Then the East Germans expect to have their own jet airliner in production. It is to be a twin-engine type of medium range, designated BB-152. Its chief designer is Bruno C. Baade, who worked for Junkers during World War II and was later taken to Russia where he developed and tested the EF-150 series of twin-jet, medium-range bombers—predecessors to the Russian Badger.

Meanwhile, the Avia Works near Prague in Czechoslovakia also has the IL-14 in production. At least four have come off the assembly line and are to be used by the Czech airline, CSA. Later production may be in part for export to Hungary, Egypt, and Argentina.

* Second Version of the MIG-17

An experimental version of an advanced MIG-17 has been flown and the aircraft is scheduled for production in Russia. It is powered by a new, axial-flow turbojet delivering 17,500 pounds of static thrust, including reheat. The type is believed to be in series production in Eastern Siberia.

* Titanium Production in USSR

Reports to the twentieth Congress of the Communist Party of the Soviet Union, as well as other information, verifies that the Russians now have a titanium plant in operation not far from Noril'sk, east of the Urals. Built between 1951 and 1953, the plant has been turning out at an unrevealed rate the lightweight, heat-resistant metal, which is so adaptable to jet engine use, ever since.

* New ADD Commander

The Soviet Long Range Flying Command, Russian equivalent of our Strategic Air Command, has a new commander. He is Lt. Gen. V. I. Aladinsky, about whom little is known. He replaces Air Chief Marshal A. Y. Golovanov, who has commanded ADD (Long Range Flying Command) since 1942, and whose fate may have been sealed by the fact that he was long closely associated with Joseph Stalin.

* YAK-24 Production

The large Soviet twin-rotor helicopter (NATO-designated Horse), the YAK-24, originally was put into production in Leningrad in 1954-55. Within the past year assembly has been shifted for security reasons to a plant in the Ural Mountains. Frames for the helicopter are produced at Saratov, while engines (ASh-82Bs of 1,430 horsepower each) are produced at Smolensk. Each YAK-24 has two ASh-82Bs. Rotor blades (forty-nine feet in diameter) are made near Bogolov in the Urals.—End



B-52C. The delivery system is one of several vital factors to be considered.

The NUCLEAR STALEMATE Fallacy

By Col. Robert C. Richardson III

WE HEAR a lot about "nuclear stalemate" these days, and 1 think it's time we took a good look at the theory and its implications. Briefly, the nuclear stalemate concept holds that when both the United States and the Soviet Union possess an effective strategic atomic capability, neither side will allow total war to occur on the grounds that it would be tantamount to mutual suicide.

This sounds good if you say it quickly. But I suggest it is largely based on wishful thinking and superficial analysis. Far more thought has been given to the implications of such a stalemate than to its likelihood. Yet, such a concept, should it become generally accepted, would materially affect world power relationships, and more particularly the use of military force as an instrument of national policy. At minimum it has now been repeated so often, and in so many forms, that it already is influencing our current defense policy by channeling resources into limited or conventional war capabilities to the detriment of home defense and of the capacity for total war.

The atomic stalemate proponents are not limited to United States circles. The New York *Times*, in an article datelined Moscow, December 17, 1955, stated that:

"The Soviet leaders have explicitly recognized that last summer's Geneva Conference of the big four heads of government ushered in an era of atomic stalemate in which war among the great powers is excluded." This eager acceptance of the implications of atomic parity by the Soviet leaders makes it all the more important that we be sure of our ground before we rely on it. The very fact that the Soviets endorse the concept would seem to support the view expressed by Paul Nitze in the January 1956 issue of Foreign Affairs that the growth of the atomic stockpile "does not tend to inhibit action by the Soviets," but "merely inhibits the possibility of action by ourselves."

What is the truth in this stalemate matter? Are we deluding ourselves and the public into a false sense of security by hoping for a situation which is highly unlikely to occur? Or, can we actually attain uneasy peace through mutual terror, as suggested by Mr. Churchill?

The stalemate concept appears to stem from two assumptions—first, that in a massive atomic exchange there would be no "winner"; and second, that in such an exchange both sides would lose. This may sound like saying the same thing in two different ways, but in this case it is not. There are historical precedents where two nations had relatively equal military power and as a result neither felt confident of success in a test of force. Here a military stalemate was apparent and a balance of power existed. The balance resulted solely, however, from the inability to win by war. It did not include the additional constraint implicit in the conviction that, not only could one not win but also that war would result in one's annihilation.

The new notion, therefore, in the stalemate concept is that of probable loss or national suicide. Thus, the risk inherent in pursuing an objective by total atomic war would seem to be substantially increased. The price of success would seem to include the destruction of one's homeland and civilization, the very things wars are fought to preserve. The joint communique issued at the end of the Soviet leaders' recent visit to India made this point clear. It said, in part, that at Geneva the great powers recognized "the futility of war, which, owing to the development of nuclear and thermonuclear weapons, could only bring disaster to mankind." (New York Times, December 14, 1955.)

There seems to be general agreement that if total nuclear warfare necessarily involves massive reciprocal damage "to both sides," it is less likely to occur than a war where respective military capabilities acted primarily to limit the prospect of early victory. If we are to have a valid stalemate condition, however, it follows that there must be a reasonable prospect that an exchange of atomic blows will, in fact, take place. This means that both sides must have adequate weapons. In addition, they must have adequate delivery means and inadequate defenses. Without weapons, there is no ability to retaliate, hence, no parity. Without the means of delivery, weapons are useless. Against an effective defense, the mere possession of weapons and the means of delivery will not insure success, nor would such defenses make mutual suicide inevitable. Thus, a stalemate between any two countries does not depend solely on the adequacy of their atomic stockpiles,

What are the alternative factors that may enter into a stalemate condition? Until we have considered these, and their likelihood of occurrence, we cannot be certain that atomic parity holds out any hope of either permanent or temporary security from total war.

(Continued on page 77)

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intercept system which automatically solves the intercept problem, computes and transmits the necessary command information for automatic utilization by airborne weapons.

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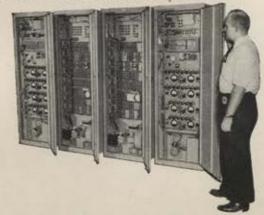
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CONDITIONS OF STRENGTH IN TOTAL ATOMIC WAR

The diagrams at the right illustrate the five possible conditions of strength that influence the relative ability of two nations to wage total atomic warfare. These conditions include atomic monopoly, delivery monopoly, equality of defenses, one-sided defenses, and mutually ineffective defenses. Of these five, only one—the latter—leads to a condition of nuclear parity, or a stand-off. But this situation requires a combination of conditions that is not likely to occur often or to last for long. Without this combination, there can be no valid stalemate, and hence no deterrent to aggression or to the use of atomic weapons in a war. For this reason, the nuclear stalemate policy is not a sound one on which to base strategic planning.

CONTINUED

Atomic Monopoly

If one nation has nuclear weapons and its opponent has none, there is no question of parity or stalemate. The nation which has them can use them without fear of retaliation. This has been clearly evidenced by the pronouncements and defense plans of the US during the last decade. In the hands of an aggressive power such a monopoly would have spelled world victory and world dominance, a victory without fear of retaliation in kind. In such a situation there can be no atomic stalemate and consequently no deterrent to total atomic war.

Atomic Parity and Delivery Monopoly

If two nations have enough atomic weapons to destroy one another, there still remains the problem of delivering them. If the delivery capability is unbalanced, if one side can put his weapons on target and the other cannot, a nuclear stalemate cannot exist. The nation who can deliver can safely engage in strategic atomic warfare without fear of retaliation. For a valid stalemate condition we must assume, therefore, that both sides have both the weapons and the means of delivering them. But is even this degree of equality enough to produce a stalemate?

The Defense Factor

We have still a third factor to consider—the defenses. Here, three conditions may exist:

Both defenses may be equally ineffective in intercepting an attack,

One side may have what it considers a highly effective intercept capability, or

 Both sides may have equal confidence in their ability to intercept an attack by the other.

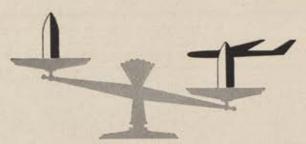
How do the prospects for a nuclear stalemate stand up under each of these conditions?

Equally Effective Defenses

Earlier in this analysis we pointed out that there were two sides to the atomic warfare coin—the poor prospects of winning and the good prospects of being annihilated. Deterrence through stalemate is more of a result of the latter prospect, that of mutual suicide, than from the for-(Continued on following page)



ATOMIC MONOPOLY When one side has all the bombs and its opponent has none, there's no question of stalemate, no possibility of deterrence. The nation with the bombs can use them without fear of possible retaliation.



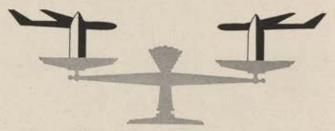
DELIVERY MONOPOLY If both sides have atomic weapons but only one side has the means of delivering bombs, the scale then tips in favor of the nation with the planes, again a situation that fails to produce a stalemate.



DEFENSE FACTOR If both sides have bombs, delivery systems, and equally effective defenses, stalemate is still unlikely since an aggressor might be tempted to strike, on the theory that aggression would be a worthwhile risk.



ONE-SIDED DEFENSES If bombs and planes are equal but one nation feels it has an air-tight defense against an opponent's strategic delivery force, an aggressive nation might feel free to start total atomic warfare.



MUTUALLY INEFFECTIVE DEFENSES Stalemate could exist when both sides have planes and bombs but inadequate defenses. It is unlikely that such conditions would exist for long, making this a poor basis for strategic planning.

mer. Thus, the presence of highly effective defenses on both sides should largely eliminate the fear of destruction by retaliation and with it the main deterrence to a strategic atomic exchange.

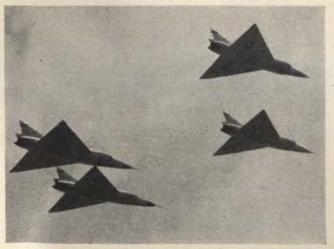
The fact that the enemy defenses are also effective is not per se a deterrent since it only reduces the aggressor's prospects of a successful penetration. As long as a nation can accurately compare its own defense capability with that of the enemy, then it will be willing to chance an attack on the theory that there is no harm in trying. It would be a worthwhile risk. If either side finds he is able to penetrate the other's defenses while his own remain effective, that side would reap a relatively certain victory. On the other hand penetration under these conditions would probably be a gradual affair since it would take time to break down the opposing defenses. Thus, should either side feel that they were losing in this attempt, there would still be time for them to call a halt to hostilities on the most favorable terms possible to themselves. They could surrender or negotiate without subjecting themselves to the type of total destruction implicit in an initial, pre-planned, atomic exchange in a war where the defenses were known to be ineffective.

In this case, where we have parity in all aspects of strategic atomic warfare, including defense, there may exist some deterrent to starting a war, but certainly no deterrent to using a total atomic strategy once a war starts. The stalemate condition here is minimal. It contains a reduced prospect of victory for the aggressor but not the fear of mutual suicide. As such it does not guarantee that the strategic atomic arm will not be used. This condition is less of an atomic stalemate than a case of relatively balanced strategic power; a condition which historically has never affected how a war is fought but only the likelihood of its beginning.

One-Sided Defenses

Progress in developing weapon systems varies with different nations. Depending on the emphasis placed on research and development as a whole, and to selected areas of research in particular, some countries will obtain temporary advantages in certain fields. We can assume that this will be true of air defense technology and that there will be times when a nation has, in its opinion, the means

Convair F-102s. Air Defense is one factor of stalemate.



of effectively intercepting the primary delivery systems of its potential enemies. This being a likelihood, if not a certainty, we must also consider the impact of an unequal defense capability on the stalemate concept.

If one nation is confident it can intercept and destroy the atomic delivery effort of an opponent, it is the same, for planning purposes, as if the opponent lacked an adequate delivery force. Thus, a serious imbalance in defense capabilities would have the same result as a delivery monopoly.

It seems clear, therefore, that if one nation considers it has an absolute, or relatively absolute, defense against an opponent's strategic delivery force, it will feel free to initiate total atomic war in pursuit of its objectives.

In addition, if such a nation has aggressive intentions, it is actually invited to use its atomic weapons strategically since this will insure success without risk. Under this condition—parity in both weapons and delivery forces, but imbalance in defense effectiveness—there would be no "stalemate" but rather an invitation to aggressive ventures on the part of the nation with the better defense.

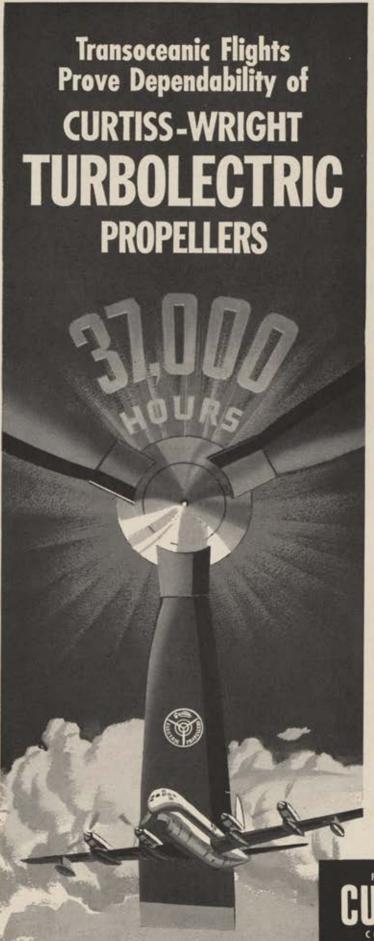
Mutually Ineffective Defenses

When neither side considers it has an adequate defense system, we would seem to have a true state of parity on the strategic plane. If we further assume that neither surprise nor the initiative can be decisive in preventing retaliation, then the requirements for an atomic stalemate are met. An attack by either side results in massive retaliation by the other. In the ensuing exchange neither stands to gain a clear advantage, and both face the prospect of substantial loss, if not annihilation.

We can certainly agree that under this one condition—where atomic stocks are adequate, both delivery systems are considered effective, and neither side can count on his defenses—the atomic stalemate concept appears to be valid. Nuclear parity, and hence a stand-off, could exist and no two nations would be likely to engage in total atomic war except in desperation. Here, at long last, we find some foundation in fact for the stalemate concept. But what are the probabilities that this condition will prevail?

The Prospects

Thus, there are five possible conditions of strength that influence the relative ability of two nations to wage total atomic warfare: (a) Atomic monopoly; (b) Atomic parity, and delivery monopoly; (c) Atomic, delivery, and effective defense parity; (d) Atomic and delivery parity, but onesided defense; and (e) Parity in atomic stocks and delivery, and mutually ineffective defenses. Of these five possibilities, only the latter provides the minimum requirements both for a deterrent to aggression, and also a deterrent to a strategic atomic exchange arising out of a localized war. Only when such a condition prevails can we feel confident a stalemate to total war exists and hence that limited wars might be the primary "hot" means of conflict. The varied rates at which weapon systems have evolved in different countries in recent years, the occurrence and likelihood of technological breakthroughs in the field of missiles, radar, atomic power, etc., all suggest that it is (Continued on page 80)





MATS Boeing YC-97J Operations Demonstrate High Performance of Propeller Type now in Production for Giant Douglas C-133A Transports

A USAF Boeing YC-97J turboprop aircraft, in operation with the 1700th Air Transport Group of the Military Air Transport Service (MATS), has set new records over both the Atlantic and Pacific Oceans—in tests that proved the precision control, smooth operation and long haul dependability of Curtiss-Wright Turbolectric propellers. In similar testing, the same MATS squadron kept two YC-97Js flying for a total of 46 hours, 35 minutes in a 24-hour period.

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dangerous to assume that this one combination of circumstances will prevail for any length of time. Thus, the concept of a nuclear stalemate between the USSR and US must be accepted with serious reservations, even in the immediate future.

For ten or more years following World War II the US had a practical monopoly on atomic weapons and delivery means. No condition of stalemate, or parity, existed, and had we been obliged to defend ourselves, we would not have hesitated to use these weapons strategically against the aggressor. Today two or more great powers are coming into relative equivalence in atomic stocks. Is this true of delivery capabilities? The current view that the Soviet has, or will soon have, the means to deliver massive attacks against the US seems to ignore the worth of advance bases in this operation. Our close-in bases should give us a decisive delivery advantage until a true massive intercontinental capability is achieved, first by aircraft and then by missiles.

Accept for the sake of argument, however, that both sides have an intercontinental capability in manned aircraft. We can then agree that an era of parity in weapons and delivery, with no evidence as yet of effective defenses, is at hand. If so, we may face a short period wherein a stalemate seems reasonable. Even this, however, is doubtful. Both sides are working frantically on air defenses and on guided missiles. Should either achieve what it considers a relatively effective air defense, the equation will again become unbalanced. Even if this defense can only cope with intercontinental manned bombers, if the US had it, we would be relatively free from the threat of atomic attack at home until the enemy acquired either forward bases or intercontinental missiles. Not so the USSR, whose defense would have to cope not only with manned bombers but also with medium-range missiles to be effective. Thus, the balance is far from permanent, at least from the point of view of the US.

The closer the threat, the more effective the defenses have to be, since they have to cope with a more diversified penetration force and with vehicles that can sacrifice range for performance. In this respect the USSR and Western Europe are both clearly at a disadvantage. Even so, we cannot exclude the possibility that the Soviets will be the first to develop an effective defense based on missiles or some other, now unknown, devices. Should this occur the stalemate would again disappear, and they might feel free to exploit their good fortune and attack the Free World.

Thus, the advent of missiles threatens to upset the present prospect for a temporary period of stalemate if accompanied by progress in defense against manned aircraft. There should normally be a time when short-range missiles are effective and intercontinental ones will still be unreliable. If this condition is accompanied by effective defenses against manned bombers, an imbalance occurs in favor of the nation with forward bases. It is akin to the case where one side has a monopoly of delivery capacity. It is also a very likely development for the immediate future in view of the emphasis now being given to both air defense and missile development.

If the US can get a "pay-off" in its search for a defense against long-range manned aircraft before the USSR has a truly intercontinental delivery system, there may never be any stalemate period at all. In view of this and of our analysis, I would conclude that reliance on, or use of, the stalemate thesis in formulating defense policy is to lean on a very weak reed. I suggest that the so-called atomic "stalemate," or "stand-off," is more of a psychological than a real deterrent. At best it is a cliché born of the natural tendency to rationalize away the prospects of total atomic war. Thus, two principles seem clear:

In order that a deterrent to total atomic war exist, as a result of a "stalemate" condition, both sides must have stocks of atomic weapons and the means for their delivery while at the same time lacking defenses capable of protecting their vital areas from destruction by the enemy. Without all three of these conditions there can be no valid "stalemate" and no deterrent either to initiating war or to the strategic exchange of atomic weapons should a war occur.

The normal processes of evolution of weapon systems, coupled with geographic differences, make it unlikely that the parity in weapons, delivery forces, and inadequate defenses will occur at any given time and/or for any length of time as between two or more countries. This being true, it is dangerous for a nation to rely upon the existence of this condition in formulating its over-all force requirements and strategic concepts, or in evaluating power relationships.—End

ABOUT THE AUTHOR

Colonel Richardson, who this year was graduated from the National War College, will assume command of the 83d Day-Fighter Wing, TAC, at Seymour Johnson AFB, Goldsboro, N. C., later this year. In World War II he was assigned to the headquarters of the US Strategic and Tactical Air Force in Europe. He also commanded a fighter group during this period. Following the war he served on the Standing Board of the North Atlantic Treaty Organization and was closely associated with its development. He has been concerned with planning activities in the War Plans Division, USAF, and spent two years with the Strategic Plans Group of the Joint Chiefs of Staff before moving to the Office of the Air Deputy, Supreme Headquarters, Allied Powers in Europe.



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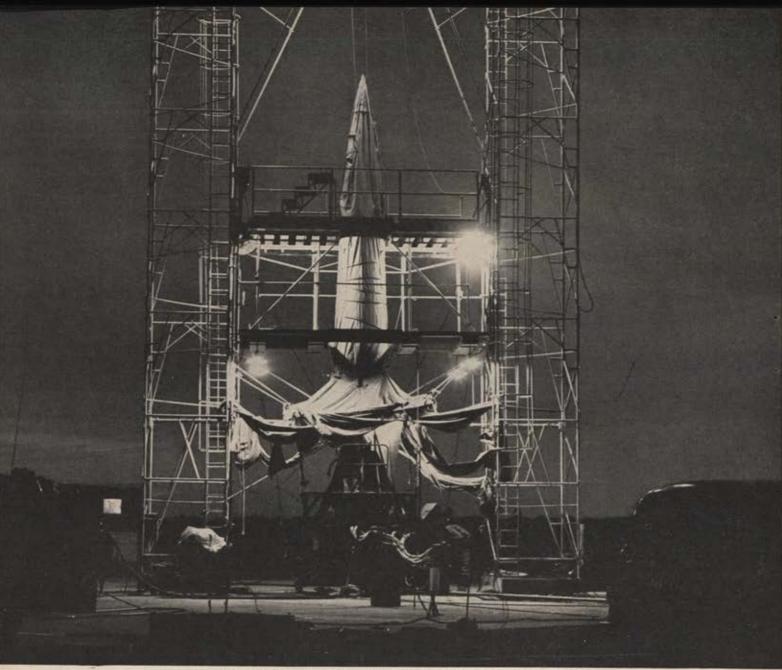
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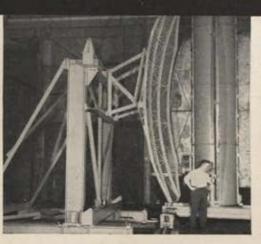


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HYPERSONICS

At General Electric, George F. Metcalf reports:

New Department to Help Solve Complex Defense System Problems



GEORGE F. METCALF, is General Manager of General Electric's new Special Defense Projects Department, located in Philadelphia, Pa. Mr. Metcalf has had extensive management experience in the military electronics field, both in Government Service and in the General Electric Company's Electronic Division.

Realizing the increased complexity of some of the nation's current defense system problems, General Electric has formed the Special Defense Projects Department. The new department will act as a Company focal point for large, highly complex missile projects. Head-quarters for the new department will be located near Philadelphia, Pa. This new department has responsibility for large defense systems that require the combined research, development, and manufacturing resources of many of General Electric's operating departments and laboratories.

Manned by a highly skilled engineering and development staff, the Special Defense Projects Department relies upon General Electric operating departments and laboratories for many specialized phases of its defense projects.

The Special Defense Projects Department is making significant contributions to America's defense program by focusing the wide range of specialized talents of General Electric on highly complex defense system problems. Section 224-4, General Electric Co., Schenectady 5, N.Y.

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MATHEMATICS



THERMODYNAMICS

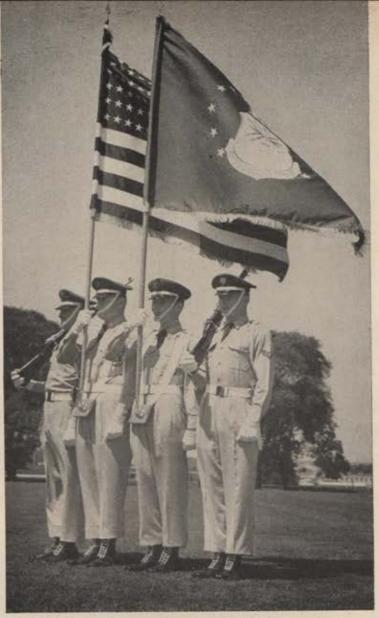


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MUSIC in the Air



Sixteen rifles in the air simultaneously is a tricky, precision maneuver that the Drill Team performs.



The Drill Team color guard has shown the Air Force colors to literally millions of spectators throughout the Free World.

THERE ARE small groups of airmen within the US Air Force who have little to do with supersonic aircraft, weapons systems, or guided missiles, yet have earned an international reputation. These groups are the USAF Band and the Air Force Drill Team, acclaimed by millions throughout the world for the high quality of their entertainment. Both are based at Bolling AFB, Washington, D. C., under the USAF Headquarters Command.

The band, organized in 1942, has developed a remarkable versatility not only in the variety of its music but in its ability to break up into dance bands, symphonic bands, marching units, a symphony orchestra, or a glee club to brighten up any occasion.

The "Airmen of Note" is one such unit. Formed from the parent band, it carries on along the lines of the famous World War II unit led by Maj. Glenn Miller, playing popular dance music. Another unit is the USAF Drum and Bugle Corps, which places equal emphasis on music and intricate marching formations. Twelve Scottish bagpipes form a colorful part of the Corps.

The twenty-four airmen in the Air Force Drill Team perform intricate precision movements in unison with such proficiency that they are in constant demand for appearances at everything from radio and TV performances and Presidential Inaugural parades to Air Force Association conventions.

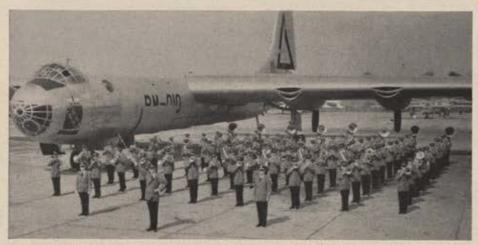
Another popular group, the all-girl WAF Band based at Lackland AFB, Tex., has flown more than 20,000 miles in the last few months, for appearances throughout the country. They, too, are versatile, and can transform into a marching unit, a dance combo, or a vocal chorus.—END



The skirl of a bagpipe and the roar of an afterburner are equally symbolic of an Air Force that combines the best of military tradition with the new and most daring weapons of war.



Col. George S. Howard conducting the USAF Band. The versatile group is able to change from a 100-piece marching band to a 90-piece symphony orchestra, an 85-piece symphonic band, five dance bands a glee club, and other units.



The USAF Band poses in front of a Convair B-36. The group plays music to satisfy every appetite—from opera to "bebop" and from symphony to swing.



The AF Drum & Bugle Corps is part of the AF Band but operates separately.

AF Drum & Bugle Corps on the Capitol grounds in Washington. The group entertained more than a million people last year.





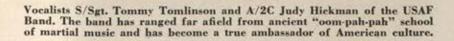
Three members of the all-girl WAF Band, based at Lackland AFB, Tex. From left: A/3C Barbara Stoneburg, A/2C Janet Schaeffer, and A/2C Marie Wurst.



Members of WAF Band, A/2C Mary Byrd and A/3C Jean Beall, on a tour.



The "Airmen of Note" carry on in the tradition of the famous World War II unit led by Maj. Glenn Miller. Formed from the parent USAF Band, they have toured throughout the world, receiving plaudits from "pop" music fans everywhere. They appeared in the movie "The Glenn Miller Story."





AIR FORCE Magazine . August 1956



in Major Guided Missile Projects

- · AIR-TO-AIR
- AIR-TO-SURFACE
- SURFACE-TO-SURFACE
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ASSIGNMENT ATOM

The emergence of atomic energy finds the finest scientific minds everywhere committed to the immediate task of bending this vast reserve of power to the aspirations of mankind.

In Canada, Canadair has been charged by the government agency, Atomic Energy of Canada Ltd., with designing and developing the first nuclear reactor intended primarily for reactivity measurements. When in service with the government's Chalk River plant, this reactor will help in the search for the type of nuclear fuel that eventually will enable man to tap an almost unlimited source of energy and harness it to his growing needs.

A reputation for imaginative precision engineering, backed by advanced scientific research, enables Canadair to take its place among those who devote their best skills to the advancement of human knowledge.



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AIR FORCE ACADEMY AFTER A YEAR IN BUSINESS

By Ed Mack Miller and Dan Wright

AF Academy cadet holds "Mach," the school's falcon mascot.



(Since the youngest of the military academies began just a year ago, its progress has been watched with interest by the American public. There have been many rumors and questions. It is said that there has been a high elimination rate; that the permanent Academy buildings would not be ready for use when originally expected; that political pressures brought about changes in architecture for the permanent Academy. Air Force writers Ed Mack Miller and Dan Wright interviewed top Academy brass via recorder to find the answers. Here they are:)

Has the academic curriculum at the Academy been changed as a result of things learned in the first year?

Well, as far as the changes are concerned that have been made in the light of experience thus far, they haven't been too substantial. The curriculum was set up originally more or less as a matter of theory on the part of a group of sixty educators. The number of semester hours has been reduced from eighty, as originally recommended by those men—civilian educators—to sixty-five, and that last revision at which the number of sixty-five semester hours was reached was arrived at by a group of general officers who had had experience in other academies in teaching. They made a complete review of what we have and readjusted the schedule, both qualitatively and quantitatively.

Have any changes been made in the type of military training being given?

Yes. We have found that we have been able to make several changes in our summer training program for the incoming freshman class by adding more to their orientation periods and increasing the time given to indoctrination in the honor system and duty code. We have found that they have been able to grasp through their own maturity and sincerity and intelligence—although undergoing a period of rehabilitation in their own minds—important aspects of both honor and duty concepts.

On the weapons training side, we have also added a short course in bayonet instruction, which is more of a physical training sort of thing and is handled by the Physical Training Department in an effort to bolster the cadets' summer training. We have greatly improved our summer bivouac training. We have made a much more realistic situation out there by making the problems more

(Continued on page 91)

"Flight-Leader" in Dependability...

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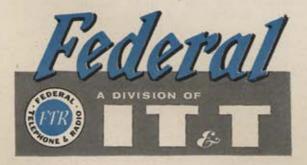
RG-11/U, 59/U -73- and 75-ohm coaxial cables used chiefly in ground equipment such as ILS and GCA as transmission lines and interconnecting cables.

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RG-87A/U, 141/U - 50 ohms; RG-140/U - 73 ohms; solid-core "Teffon" coaxial cables for highertemperature applications.

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in line with what could happen and what will happen to them in time of actual warfare—more of a Korean-type of operation. And then we have cut down some of the infantry-type training which we had last year, training which we feel now perhaps will never be utilized by them as officers or as airmen in their future Air Force careers.

The bivouac, of course, is a week-long period at the end of the summer training whereby the cadets are marched to the Lowry Bombing Range, a few miles east of Denver, and trained in various aspects of ground warfare. They get to shoot weapons which they have only fired "dry" before, such as the pistols and the carbines which are inherent Air Force weapons. We further give them demonstrations in chemical warfare, using both the types of weapons they can expect to use and the types of weapons that conceivably might be used against them.

Further, they are given a demonstration of aerial firepower, with pilots of the Colorado Air National Guard firing rockets and .50-caliber machine guns and dropping bombs and napalm, so that they get a graphic idea of the devastating power of the jet as a gun and bomb platform. Further, we will subject them to forms of gas attacks

by air.

In addition to that they will be required to study the methods of setting up a camp, messing facilities, field kitchens, latrines, showers, and so on. There will be a number of problems involving internal security, such as the simulated infiltration of saboteurs into the camp at periodic intervals.

New Superintendent at the Academy—Maj. Gen. James E. Briggs. He replaced first "Super," Lt. Gen. H. R. Harmon.



Was the first year satisfactory from a sports angle? What are the prospects for '56-'57?

We have what we consider some outstanding athletes. For example, one of the boys, Cadet Charles Zaleski, won the Rocky Mountain Wrestling Championship in the 177-pound class. Our Intercollegiate Rifle Team, although it was the Academy's first such team, won first place in the national freshman shoot-off this spring.

Our major teams are looking forward to successful seasons in the future. We have a terrific basketball player in Cadet Bob Beckel, from Washington State, who averaged nearly thirty points a game over a twenty-game season against all types of competition. It's hard to tell about football, but Buck Shaw had a fine spring session, and this fall we step up into the Rocky Mountain Conference. Time will tell.

Are the upper-class cadets getting pilot training this summer?

Yes. Cadets are being sent in groups of ten to four bases in the southeast, south, and southwest. There they will not check out, but will fly in T-28 and T-34 trainer-type



Convair T-29s are used for observer-navigator training. During his four years at the Academy, the cadet will study all phases of flying—from oxygen to polar navigation.

aircraft. We do not expect them to solo; however, we do expect them to become highly enthusiastic about the possibility or probability of flying. They should get in the neighborhood of ten to fifteen hours of flying time during the two-week period each cadet is down there.

All cadets will be expected to undergo pilot training upon graduation from the Air Force Academy. There will be some, however, who at that time will not meet the flying physical requirements and for that reason will not be expected to take the training. Everybody who is physically qualified will be expected to attempt to earn his wings.

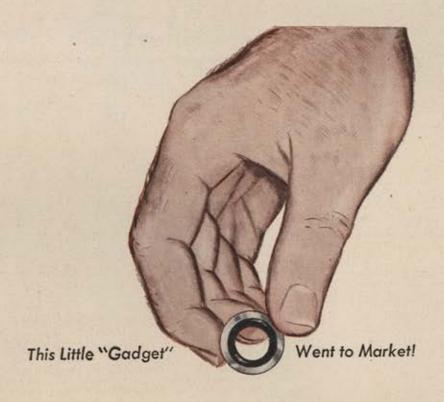
Cadets in the first class are also touring the country on visits to typical SAC, TAC, and ADC bases as part of their education on the Air Force mission.

Is it true that there have not been as many applications as expected for the Air Academy?

No. The reverse is true. We have had far more than we can handle. I just wish that we could take in more, but owing to our limited facilities, 300 will be our maximum number of new cadets this coming year.

Will the Academy be at Lowry AFB longer than originally intended? Will more buildings be erected at the temporary site?

Yes. We will be here longer. We originally planned this place to accommodate 686 cadets and seventy Air Training Officers. Now we have had a slippage from 1957 to 1958 as regards moving to the Colorado Springs site. We have modified a few more barracks to take care of the additional cadets, and we are also building some more athletic fields and doing a little work to correct some deficiencies in our present facilities. We are also building one tech training building. Although we would use the tech training building only for a year and a half or so, it



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would be built for long-term use by Lowry. They don't have enough academic space right now for their training schools and have asked for additional facilities like this one.

There have been no buildings built specifically for the Academy except one small gate house. The three main Academy buildings were here before we came. All we did was go out and fix up the grass, paint the buildings, and modify them. The cadet barracks were modified too. Previously they had sixty-man open bays, but the cadets have to study too hard to live in one big bay together, so the barracks were partitioned into rooms.

How is construction progressing at the Colorado Springs site?

About on schedule. All the land has been purchased from individual owners. Most of the access roads are under construction and the utility lines laid. Work has begun on the cadet area grading, and a special "sidewalk superintendent's" vantage point is being constructed at a high point alongside the Denver-Colorado Springs highway so tourists can take a good look at the Academy site this summer. Mock-ups of cadet quarters are in place on the site for use in determining the best total environment in their rooms as regards comfort of the individual cadet and ease of maintenance.

Is it true that the changes to permanent site Academy buildings were forced by powerful lobby groups?

The reason why the exteriors of the buildings were changed was not by any pressure group or by Congressional objection. The buildings, as presented on the fourteenth of May last year, were the earliest concept of what the buildings would appear like. For example, at that particular time, our operating people in the Academy did not have sufficient time to see which part of which building should apply to which function. Now let's remember this: that the site was selected in July of '54. On about the first of September 1954, we had our first copy of the requirements of the various facilities, and most of those initial forecasts of space necessities have proved fairly accurate, except for some buildings up in the cadet area. Those are the only ones there have been any questions on.

The Cadet Quarters building has remained unchanged, in both the exterior and interior functional arrangements. The question as to whether the exterior walls were to be entirely glass or part masonry and part glass has not yet been fully settled. Now it will be masonry from the floor up thirty inches and glass above that. The Academic Complex was originally conceived to include the Library and the Social, Humanities, and Scientific facilities, but inasmuch as the Library is a supporting element to those educational areas, we wanted a separate structure. Then we had a problem of locating the Commandant's Cadet Headquarters, which controls the military and airmanship part of the training and is also charged with the wing command. We wanted to put them so they would be in the center of everything, and so they have since been added to the Library portion.

The interiors, as originally designed, have stayed pretty much the same. Other than the relocation of certain sections and offices in the master plan, about the only major change that has been considered is, as previously noted, in the tentative decision to use less glass. The problem of classroom lighting entered here. You don't put glass on and then paint it. And you don't want obscured glass because in classrooms you want a standard level of light so that every student has the same chance. Those are contributing influences on the exterior skin. Other than that,



Time for a few pointers on a parachute harness—a piece of equipment that may save the cadet's life in the future.

there have been very few changes. But we will continue modifying those designs up to the point where we must quit if we are going to get the building finished.

What will the permanent Academy facilities be like? Will they be as elaborate as those at West Point and Annapolis?

Basically speaking, the Air Force Academy has certain allied functions that West Point and Annapolis have in their academic curriculum; however, there are increased functions such as the flying portion which West Point and Annapolis don't have. The one differential that people must realize is that if the West Point and Annapolis type of construction were to be duplicated, it would be out of sight as far as costs are concerned. For example, at West Point, the headquarters building is a seven-story, allmasonry building with practically no concrete in it. It has four-foot thick walls of granite. If we tried to reproduce that type of construction, the cost of the Air Force Academy would be astronomical. Therefore, the design of the buildings had to take into consideration the most expeditious and the most economical systems of construction. For example, we have gone to the use of precast panels in our warehouse service buildings, hangars, and so on. This construction gives us a functional yet permanent building.

Now in the academic area you will see quite a bit of masonry type of granite and marble precast slabs. It is almost as long lasting but it is a lot cheaper than cut stone. The designers of the buildings took into consideration the economics as well as the functional side of it and the type of construction now called for is possibly the most inexpensive of very permanent type construction. Basically, these buildings will have a steel frame, and will be fireproof, with concrete floors.

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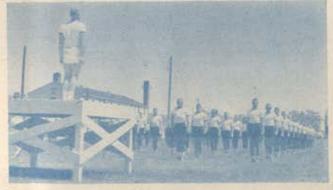
Academy basketball team plays one of its scheduled games.



Falcons play Denver University freshmen in first game.



Judo is only one of many sports the eadets participate in.



Continuing program of athletics keeps the cadets in shape.

The cadet quarters consist of 1,320 rooms, with each room built to accommodate two cadets. The rooms have a net area of approximately 284 square feet. They will have one wash basin in the room. They will have built-in clothes cabinets, two beds, two bookcases, two desks, and two floor lamps.

Each cadet housing building is built on the Air Force's wing manpower concept. In the cadet buildings there will be six groups of four squadrons. The buildings will be four floors high, with a squadron on each floor. Within the cadet quarters there is also located the Cadet Supply, where they can get their bedding and rifles and field equipment, plus the Cadet Store, which is the PX type of operation, except that the cadet gets the merchandise at cost, the overhead being paid by the government. Also in that building are twenty-four squadron assembly rooms where meetings of the entire squadron can be held.

Also in the building will be ten activity rooms, one for radio hobbyists; one for model engineering, for model aircraft, model trains; one for the Academy's annual yearbook staff; and one for the student magazine or weekly paper. There will also be rooms for chess, bridge, and personal consultation. We have taken all of the problems that West Point and Annapolis have had in their total of about 300 years of existence between them, and we hope to have profited by all the mistakes that they have made or inadequacies of their facilities and designs. For example, our gymnasium is a much better gymnasium than the one at West Point; however, it is smaller because West Point's gymnasium was built in about seven increments and you have to have a guide to get from one end to the other. Ours is smaller in square footage but it is weighed out to meet requirements, so in effect we are saving money.

How good are your chances of getting into the permanent facility by 1958?

Well, our design construction program now calls for enough of the facilities to be completed during the summer of '58 to open the doors for an academic year during the fall of that year. Actually, there will be people down before that, certain service elements, for example—those who have to start stocking the furniture and supplies, trucks, and vehicles, and airplanes and things like that that will also move in early, but the student complement of some 1,200 cadets won't move in until the semester begins in the fall of '58.

Has the Academy adopted the West Point or Annapolis honor code?

We studied all angles of the honor code problem and were able to incorporate other facets of other codes into our own, and as a result we have a package honor code which we really feel is the finest anywhere in the world. It is based on the primary assumption that a cadet will not lie, cheat, steal, or tolerate anyone who does. We also stress duty along with honor. We try to keep from asking a cadet if he has done what he should do. We want him to consider it his duty to report himself if he hasn't done what he should. We assume he has unless he tells us otherwise.

I would say the one important thing—the one most important factor—that has proved of greatest value to us is the way the cadets have accepted and enforced the cadet honor code. They have taken this code (which we gave them in a package deal for consideration), they have gone into it, they have discussed it, and they have come up with certain changes which they have requested, and in turn

(Continued on page 97)

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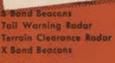
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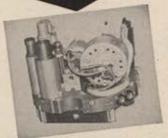
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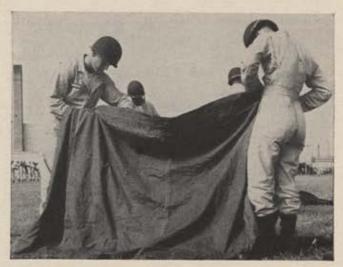
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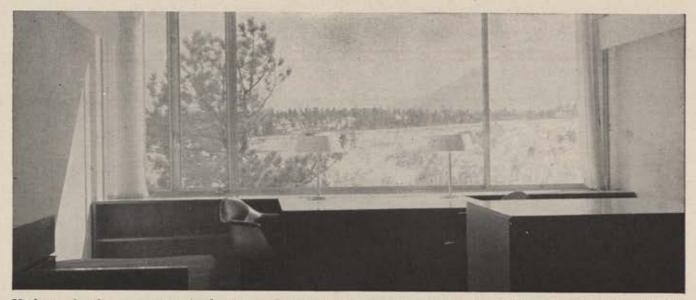
EAST COAST OFFICE: P.O. BOX 391, WILTON, CONN. + DAYTON, OHIO - 120 W. 7nd ST. + WASHINGTON, D.C. - SUITE 803, 1701 "K" ST., N.W. CANADIAN DISTRIBUTORS: AVIATION ELECTRIC, LTD., MONTREAL 9 . EXPORT DIVISION: BENDIX INTERNATIONAL, 205 E. 42nd ST., NEW YORK 17 they have, I believe, developed the best honor code of any unit or of any academy or any university or college within the entire country. It is based on West Point's honor code; however, in that our halls were not bound with ivy or our thinking bound by traditions, we were able to weed out those parts of the several honor codes which we considered more steeped in tradition than in necessity.

Have you found that the discipline system set up for the first year was either too easy or too hard?

As far as discipline goes, we have not changed any of the standards that were initially set up. Generally, for a violation of any one of the cadet regulations, demerits are awarded. In the first six months the cadets were allowed 163 demerits, and if any of them exceeded that number of demerits, they were subject to dismissal from the Academy. Along with demerits, the cadets march tours with rifles out in the quadrangle area each weekday and Saturday afternoon. They march back and forth with a rifle on their shoulder for an hour for a specified offense.



At the end of summer training, the cadets go on bivouac.



Mock-up of cadet quarters on Academy site, showing one of the many furniture arrangements now being evaluated.

As far as the over-all picture of discipline is concerned here at the Academy, it is reasonably severe. It is of its nature stern and exacting, but proof of the fact that it is not overly severe is that some of the cadets who have left have written back to state how much they miss the Academy, how much they wish they were back, how sorry they are that they flubbed their chance here at the Academy in their lack of responsibility for their behavior.

How is the unique system of using young officers as an artificial "upper class" working out?

The Air Training Officers are doing a highly commendable job. However, you must realize that this type of relationship between commissioned officers and these young cadets is not a relationship that is born of desire but rather of necessity. These officers have given the stability of mature actions and judgment to our cadets and have thus maintained the dignity and sincerity demanded in this role of not only Air Force officers but also pseudo-upper classmen.

Is it true that there has been an abnormally high percentage of drop-outs in the first class?

The percentage is not high. It depends, of course, on

what you refer to. If you refer to our percentage versus the other service academies, you will find that actually we are very similar. The percentage is well in line with what we expected when we accepted our initial class.

Why have these young men dropped out of something that is as unique as membership in the first class?

In general there are three main reasons for resignations or even wash-outs. First, let's take the resignations. Factually the earliest resignations we had were on the part of young men who came here without proper motivation. They did not have a clear concept of what they wanted in life, and what their obligations to their country will be. When they experienced the course given here, the program seemed too hard for them.

As far as another group goes, they were discharged for physical reasons. They couldn't meet the high physical standards; they couldn't build up their conditioning and stamina to the degree that was desirable.

And in the third group, we place those who find difficulty in their studies, especially in the field of mathematics. Mathematics seem to be a problem for a number of cadets. For some it is very definitely a stumbling block.

(Continued on the following page)

ACADEMY.



A group of new cadets, still in civvies, arrive at Lowry.

Did you have any unusual reasons for cadets dropping out?

Yes, we have had many surprising reasons why these people have desired to resign. We found that many of them have been more or less coerced to come to the Academy by their families. Some wanted their sons to come because of the honor of being members of the first class. The father wants the lad to become an aviation cadet or enter the Air Force Academy to be a cadet, and the mother agrees to the professed desires of the son. And when they get here and the boy has a problem, it depends upon which parent he writes as to what answer he gets. He gets pretty well torn up emotionally by conflicting answers, and as a result he is so mixed up that often all the counseling and guidance that we can give is of little avail.

We found two or three boys who physically couldn't

take the type of training and the type of living which we have to offer, and, as a result, they have requested and have been granted resignations. Others have come up and requested resignations, but through our counseling and guidance, they have decided to try to stick it out to see if they would like it better as time went on, and, of this group, the number who have decided to stay on is surprisingly high. Not that we have an opportunity to save often, but when we feel that a man has the qualifications which we would like to have in our officers, we do our very best with that man; and, as I say, with that type of person, we like to feel that we have been able to do rather well.

Are the requirements being altered at all to try to cut down the elimination ratio?

Yes, we have adopted many different measures, especially the criteria for entrance. We have included this year, for example, a physical aptitude test, and by the time our nominees are selected, we shouldn't lose any for lack of physical aptitude. Also, we have raised our academic requirements. That means our academic losses should be less. We have further included a questionnaire which involves motivation, which should catch those who are being pushed to come, but who really are not inclined to a life as a career officer. It was found, also, that a number of cadets were deficient in physical coordination, which is of course, very necessary for pilots. We have tried to correct this by strengthening the entrance tests in the coordination area.

One last question. It is true that the cadets wear blue pajamas?

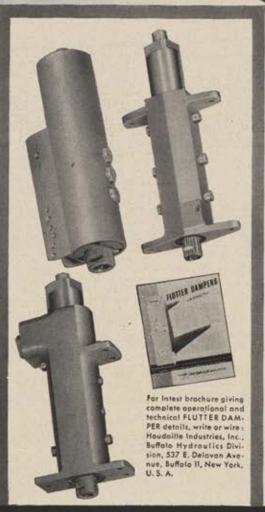
Our nightly inspection is for presence rather than for color of pajamas. We inspect often enough that it behooves a man to wear pajamas. The gray pajama is, of course, the only authorized pajama that he has, so if he is wearing them they should be gray rather than blue.—End



Once a month the cadets have a formal dance at which they must wear their regular dress jackets, with a black bow tie.

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Cadets must sit at rigid attention to eat.

'Sir, the Soup Is on the Ramp'

Cadets at the Air Force Academy are developing a lively brand of their own slang

By Ed Mack Miller



An Air Training Officer, one of the group of young pilots acting as upperclassmen, gives pointers on saluting.

N THE happy new vocabulary of the equally new Air Force Academy, a "doolie" is a guy not to be envied ("doolie" being a term picked up from West Point and meaning a plebe or the rawest of the raw materials from which soldiers—in this case, airmen—are made).

But "doolie" is about the only term the new service school has picked up from the Army. And, even so, it doesn't appear that "doolie" is catching on too well as a popular term.

In fact, one of these days some bright young cloud-whacker will light up like the south end of an afterburner, and a new term, smacking of the wild blue yonder, will emerge to replace the slightly shopworn "doolie," and that West Point expression will go the way of all things Army as far as the Air Force is concerned.

At the Air Academy, probably the biggest menace in the life of a "doolie" is a "bogey," a somewhat more Air Force-ish word meaning an enemy on the wing. A bogey, in the argot of the Air Academy is an ATO, or Air Training Officer, one of the young lieutenant-type Sabre jockeys who double as a kind of artificial upper-

classmen for an Academy that only this fall will have a working sophomore class.

It is a bogey's job to teach military discipline to the lowly Air Academy underclassmen, and that Mr. ATO does with a vengeance.

When a cadet sees a particularly unappealing ATO coming his way, he might be tempted to mutter to his buddy: "Watch it . . . Bogey at ten o'clock."

And, if the approaching ATO is of the usual spit-and-polish perfection breed, he will make known his desire to speak with the cadet by saying, "Taxi over here, Mister."

The cadet can always make an effort to escape by replying, "Sir, request permission to taxi past."

Generally, the ATO will stall the cadet momentarily by asking some question, such as, "What is your altitude, Mister?"

The stock answer to this question being, "Sir, my altitude is 5,420 feet and far, far above that of West Point and Annapolis, sir."

A less formal answer to the altitude query tweaks the other academies' noses a little harder when the cadet answers: "Sir, my altitude is 5,420 feet and far, far above Hudson High and Canoe U."

When the ATO barks, "Pull in your flaps, Mister," the cadet must stand at attention and clamp his arms tighter to his sides.

At the command, "Blast off," the cadet is dispatched to move out and go about his business.

The cadets rise to a buzzer in the hall of the barracks at 5:50 a.m., and have an inspection, mainly for roll call, at 6:00. After inspection, they "peel off" and dress. Breakfast is at 6:30.

When an ATO yells, "Dormitory 892, ALERT," the dormitory is on stand-by status. Formation will be in two minutes. "Dormitory 892, SCRAMBLE" signifies that the men in the dormitory are to fall out in the quadrangle for formation immediately.

When walking in a corridor, the cadet must keep to the right side of the hall, looking to neither side, All corners must be "squared away."

When a cadet meets an ATO walking the other direction, he must stand at attention with his back to the wall until the ATO has passed. If the ATO is standing still, the cadet must ask, "Sir, may I post (pass)?"

Cadets do not eat square meals, although they must sit stiffly at attention when at the meal table. They can eat only one bite of food at a time, and are required to lay their eating utensils down between bites. They

(Continued on page 103)



Actual test firing of a modern ROCKETDYNE rocket engine at the Field Test Laboratory in the Santa Susana Mountains.

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BUILDING PRECISION INTO TARGET ZERO





Books play an important part during a cadet's four years at the Academy.



The cadets are roused at 5:50 a.m. by a buzzer in the hall of the barracks.



In cadet slang, "a cold pilot" is the man who pours and passes cold drinks.

'SIR, THE SOUP IS ON THE RAMP'.

CONTINUED

must also take only a sip of coffee or water at a time.

At each dining table there is one ATO and nine cadets, When wanting something at the table, the cadet announces, "Control tower, this is Air Force jet number 2345667." Then he follows up by asking, "Sir, does the lieutenant wish some beans?" If not, then he may ask for some.

At each table, a particular cadet is in charge of announcing the arrival or departure of food. The "navigator," as the cadet is called, may relate the arrival of potatoes at the tables by saying something like, "Sir, the potatoes have met their ETA and are on the ramp."

To announce that soup has been placed on the table by the waiter, the navigator must say, "Lieutenant, sir, the soup is on the ramp. Does the lieutenant or any of the other gentlemen on the ramp care for soup?"

"Sir, I have a NOTAM" (NOTAM means "notice to airmen"), means that the navigator wishes to announce that all members of the table have been served properly.

"Sir, the milk is on cross-country," is the expression the navigator uses to

announce that the milk pitcher has been sent to the kitchen for more. When the waiter returns the milk pitcher to the table, the navigator lets everyone know about it by saying, "Sir, the milk has returned from crosscountry."

"Sir, the fuel injection is on the ramp," denotes that the water is now on the table.

A "hot pilot" at one end of the table pours and passes the hot beverages, and a "cold pilot" at the other dispenses the cold drinks. A "crew chief" stacks the dirty dishes.

On the football field, "take-off position" refers to the player's crouch just before the ball is snapped. "Take runway" means to get lined up or move into position; "blast off" is, of course, the order to charge.

If the coach makes comments about a player's "wheels," he means his legs; if he tells a player to go get a "hard hat," he means a helmet. "Gear" or "landing gear" also refers to a player's legs, and on the field a "bogey" is no longer an ATO but, rather, an opponent.

To "bounce" is to line up for block or tackle practice, and to "boom" is to strike with the speed of sound. A "sonic boom" is merely the sound of good contact in a block or tackle, and a "barrier buster" is an exceptionally good tackle or tackler.

To "buy the farm" is to do something which results in loss of the ball, yardage, etc., or to make a serious blunder of some sort. A "hot start" refers to an offside or backs in motion, and "put down your flaps!" is just another way of saying, "slow down!"

"Mach," as in flying, is a description of speed (.3 Mach would be very slow, and Mach 1 would be fast).

slow, and Mach I would be fast).
"Break" means to pull out, and
"sandbag" is to go along for a ride.
"Tower" on the field is the bench or
coach (e.g., "I got the word from the
tower").

A "flame out" is a play that fizzled; and an "afterburner" is a plus of extra effort (such as, "Kick in that afterburner!"). "Max" is just short for maximum effort or all-out performance.

All cadets have to memorize practical things. For instance, navigators must memorize star positions and be ready to report them at the request of any ATO.

(Continued on following page)

How to Make Yourself Understood at the AF Academy

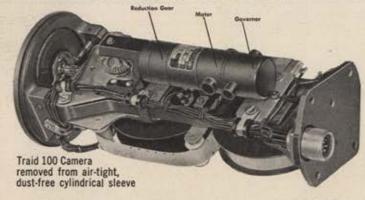
...... ATO. Used by cadets when infracting a rule, such as talking on grounds. (Unofficial) "Bogey at ten o'clock." Liquid Fuel Milk, water, etc. JP-4 (Jet Fuel) Coffee. Control Tower ATO at table. Flame-outOut of food, such as, "Sir, the bread Pass. Used when meeting ATO in hall. has had a flame-out." No. 1. for Take-off Ready to leave for the kitchen, such as, "Sir, the milk is No. 1. for take-off." NOTAM Notice to Airmen. Peel Off, or Secure You may leave. Used after 6:00 a.m. inspection is over. Fuel Injection Water. IFR Flight Plan At the table, codet must rattle off altitude, time, etc. ETA Estimated Time of Arrival.

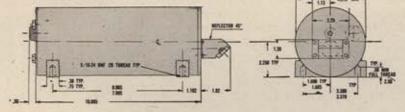
MISSILE CAMERA

A Report on the Ejectable, Floatable, Shock Sustaining Traid 100 Camera

Safe recovery of film after ejection from a missile at an estimated 1,000 g's shock acceleration has been assured by repeated tests of the Traid 100 Camera. Tests prove that the camera can withstand a free fall of 300 feet without exhibiting light leaks or sustaining film damage. Recent centrifugal tests at Lockheed's Missile Division, Van Nuys, Calif., proved that the Traid 100 Camera functioned perfectly at 128 f.p.s. under 25 g's applied in both directions of the three major axes.

The ejectable feature of the Traid 100 is coupled with parachute suspension. Its unusual ruggedness, its ability to float, the ease of mounting and its reliability of operation make this camera especially useful in both military and civilian testing.





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CAMERA CASE: Choice of steel or non floating aluminum . . . CHANGE GEARS: Choice of 16, 24, 32, 64 fps . . . FLOATATION: Light Aluminum FLOATING Case and casting . . VIEWFINDER: Positive, paraflax correcting . . LIMITING SWITCH: Automatic power cut off at end of run . . . CORRELATION SWITCH: Provides impulse of each frame to counter . . . TIMING SYSTEM: Single or two light system.

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The cadet gets a four-week vacation in the summer after his freshman year. He also gets ten days of leisure time during Christmas vacation. Sophomores will be able to go home for the ten-day holiday during Christmas.

The cadet training program would be incomplete unless these future officers received at least some sort of preparation in the social side of things. Once a month, the cadets have a formal dance, at which they must wear their regular dress jackets, but with white shirt and black bow tie.

Since cadets may not drive or own cars, the girls must provide their own means of transportation to and from the Academy for these dances.

To facilitate the meeting of girls and cadets, busses were sent to the girls' colleges in the area the first part of the school year, whenever there was a social function at the Academy.

Now that most of the cadets have met members of the fairer sex, this has been discontinued. Girls may also come out to the Academy and visit during the cadet's free time,

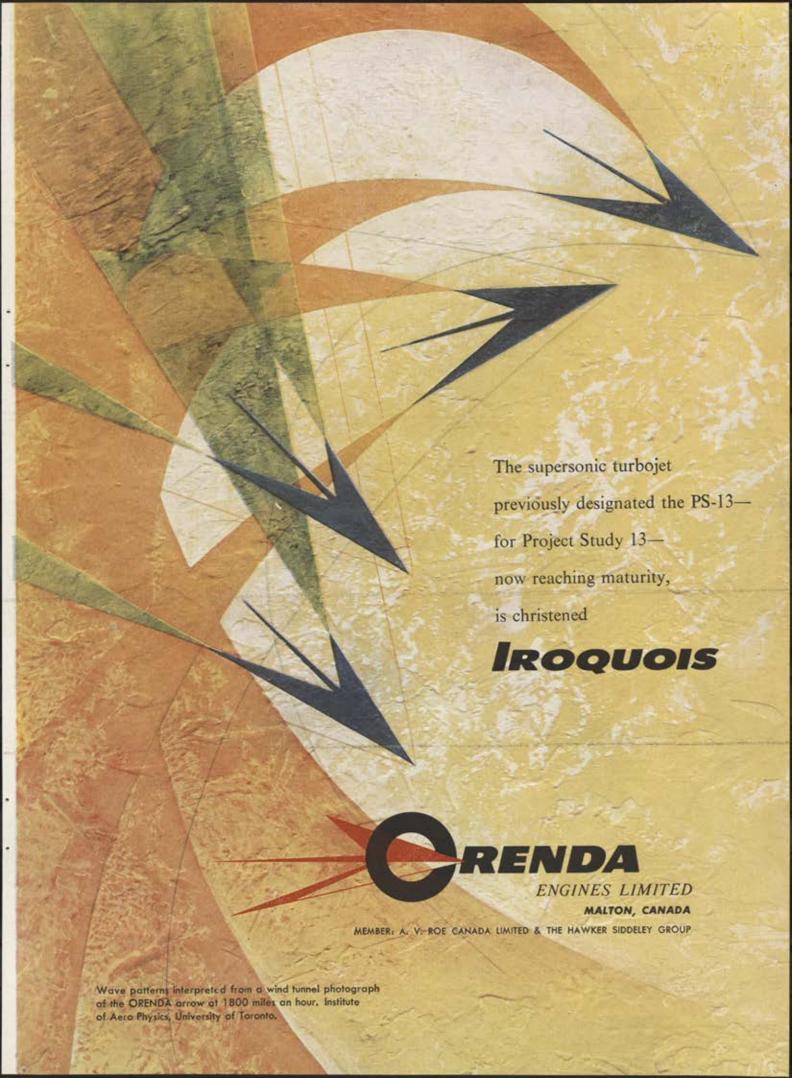
Free time for a cadet is Wednesday from 3:30 to 5:30 p.m. and Saturday and Sunday from 2:00 to 5:30. During those times, a cadet may take a date to the base movie theater or to the recreation hall.

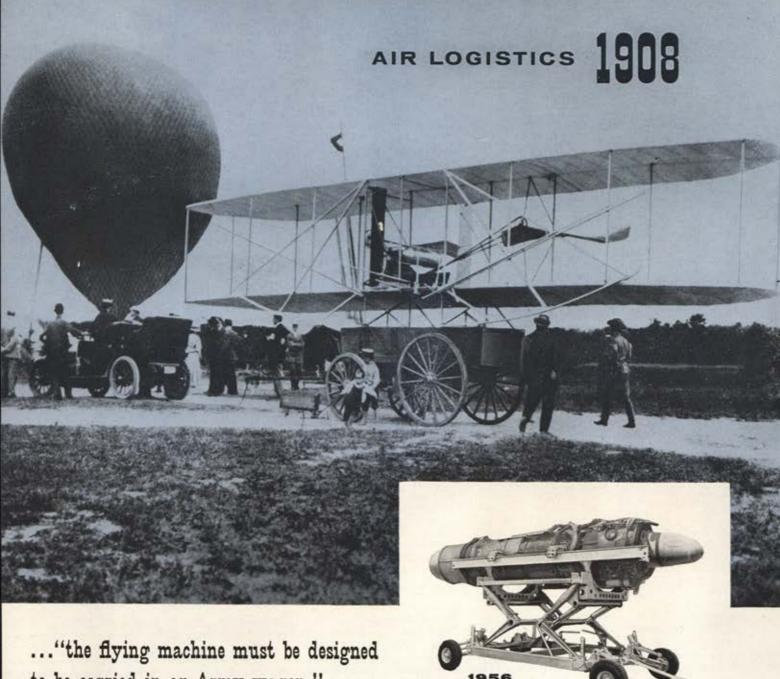
But, if a cadet's girl is really attractive, there's always the big danger that a squadron of his buddies will "vector in" on his prize, "lock-on" to her, and proceed to shoot him down, with appropriate remarks about "landing this little fighter by taking her into a dive."

And, if the beleaguered cadet gets by this concentration of "flak," there are always the bogeys to look out for, of course.-End



At the order, "Pull in your flaps, Mister," the cadet snaps to attention.





to be carried in an Army wagon."

U.S. Army specifications, 1908

Aircraft ground support equipment has come a long way in 48 years. The Air-Log System - one unit of which, the Model 4000A positioning trailer, is shown in inset - is an example of system engineering required to meet the exacting demands of the Armed Services to maintain Readiness in this jet age. The research, engineering, and manufacturing facilities of Air Logistics are dedicated to furthering that readiness by designing and producing a complete system of ground support equipment today that will meet tomorrow's demands of both military and civilian aviation.

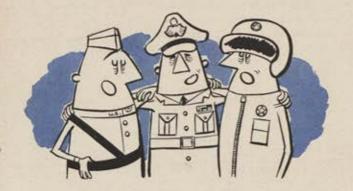
ENGINEERS:

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AIR FORCE AIRS

By T/Sgt. William Wallrich

W HEREVER the United States Air Force has gone, it's brought with it an aura of youth, a buoyancy of spirit frequently manifested by reckless caution but more often by a certain indifference that met discomfort, disappointment, and even danger with song.

And, quite frequently, these songs were of the Air Force's own coinage. Almost from the very beginning of military aviation in this country, the parody-maker has been at work.

This is not unusual, for much of the history of our country-its people, manners, beliefs, and customs-has been written in the parody-ballad form.

Folk music—and the songs and parodies of the Air Force are definitely folk music—is most often defined as songs whose origins are not known. The songs simply exist, either in the historic past or immediate present. However, all too few contain evidence that points to a specific individual, event, or place of composition that lets you pin them down in time and place.

No matter what their origin, folk songs have become a part of the cultural heritage of the Air Force. The folk, if you will, who accept them and mold them, make them their own by imposing their individual and collective stamp on such songs.

These parodies are being sung and have been sung wherever there are men of the US Air Force. They are as much a part of military life in the field as cold Nissen huts, dehydrated potatoes, or in Korea red stars representing MIG kills stenciled on the silver sides of Sabres. In their way, these songs are as important to morale as are the conditions, events, and personalities that inspired their creation and retention.

Here are a few random examples of Air Force parodies. In their way, they accurately reflect the manners, morals, and morale of fighting men and fighting units.

Typical of the longer, ballad-style parody is the "Casey Jones" of the Eighth Air Force in World War II. It's sung to the older tune of the same name. It is, and was, a fine drinking song, especially appreciated by B-17 outfits.

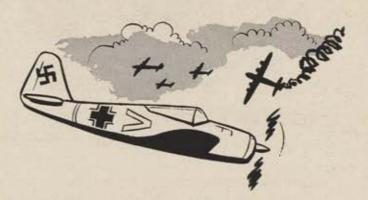
CASEY JONES

Now, come all you airmen if you want to hear, The story of a brave aviateer. Casey Jones was the pilot's name, On a big four engine, boys, he won his fame. When they woke Casey up it was black as sin. Operations told Casey that the target's Berlin. Casey could tell by the lines on the map, That this was gonna' be his final lap.

Chorus:

Casey Jones, lines on the map.
Casey Jones, his final lap.
Casey Jones, lines on the map—
Yes, this was gonna' be his final lap.

The major said, "Boys, there'll be some flak."
Casey could tell by this that he wouldn't be back;
He turned to his crew and this is what he said,
"We're gonna' make it to Berlin but we'll all be dead."



Casey walked into the drying room, He hollered for his clothing with an awful boom, The sergeant knew by the bastard's groans, That the man at the counter was Casey Jones.

Chorus:

Casey Jones, the man at the counter.
Casey Jones, by his moans and groans,
Casey Jones, the man at the counter—
Yes, the man at the counter was Casey Jones.

Casey took off and all he left was smoke.

He said, "I've got a present for the Herrenvolk.

They may get me but I'm here to tell,

There'll be a lot of Nazis down in hell."

(Continued on following page)

They formed up over Buncher twenty-eight. Casey could tell they were gonna' be late. He called up the leader over VHF, Said, "We'd better hurry up or we'll all be left."

Chorus:

Casey Jones, we'd better hurry up.
Casey Jones, or we'll all be left.
Casey Jones, we'd better hurry up—
Yes, we'd better hurry up or we'll all be left.

Now Casey was flying in the diamond that day, He said, "For the *Luftwaffe* I'll be easy prey. There's gonna' be a decoration coming to me, But it'll be the Purple Heart posthumously."

He took a burst of flak between three and four. He yelled, "That's all, brother. There ain't any more." He rolled her over, went into a spin. They couldn't bail out so they rode her in.

Chorus:

Casey Jones, couldn't bail out.
Casey Jones, they rode her in.
Casey Jones, couldn't bail out—
No, they couldn't bail out so they rode her in.

Fireball leader called to Yellow Low.
Said, "See that awful sight down there below?"
Yellow said, "I'll bet you half a crown
That he landed on the gunner that shot him down."



Chorus:

Casey Jones, landed on the gunner.
Casey Jones, that shot him down!
Casey Jones, landed on the gunner—
Yes, he landed on the gunner that shot him down.

The boys were awful sad that evening in the club. They seemed to think that someone had flubbed their dub.

The colonel said, "There'll be no more of this— There's another crew waiting at the station in Diss."

Many of the songs written by pilots and aircrews tell definite stories or, as in the case of the next example, were written for the purpose of instruction. "The Saga of the Swede," which is sung to the melody of the old cowboy song "Utah Carl," is another vintage World War II parody. It was strictly a heavy bomber song and was popular with both B-17 and B-24 outfits in the ETO.

THE SAGA OF THE SWEDE

We were going on a mission
And the Swede was on my right,
When the leader made a steep turn to the left.
Oh, the Swede he racked it over,
And he held it in there tight,
But he couldn't hold it there despite his heft.

Oh, the Jerries they did bounce him
As he fell off in a skid.
So I cut back my four throttles
To go back and help the kid.
It was too late when I got there,
He was going down in flame,
And it's lucky that I didn't get the same.

Oh, the Jerries they did bounce him, And I say this heartfully, If you will fly your missions You must cut across your knee. Now you all have heard my story, It's the Saga of the Swede, And you'll never make a steep turn When you're flying in the lead.

Many of the songs sung by the Air Force today go far back. Certain basic songs that saw their inception in the first World War are still in use. Few, if any, changes have been made, though many have been brought up-to-date through changes in terminology, especially that of technical vocabulary, and, at times, in setting.

Typical examples of this are the numerous parodies based upon the satiric, sometimes tragic, humor portrayed in the old vagabond song, "The Dying Hobo." During World War I, one of the most popular Air Force ditties was "Beside A Belgian Estaminet" sung to the tune of "The Dying Hobo."

BESIDE A BELGIAN ESTAMINET

Besides a Belgian 'staminet, When the smoke had cleared away, Beneath a busted Camel, A fighter pilot lay.

His throat was cut by the bracing wire, The tank had hit his head; Coughing a spray of dental work, These are the words that he said: (Continued on page 111)





"Brain cells"

SEALED IN GLASS

This Raytheon flat press subminiature tube is about to be inserted in the pilot mechanism of a missile to help guide it to its target. Long-range radar that "sees" distant planes—precise automatic pilots that "fly" commercial aircraft—computers that "think" thousands of times a second: these are a few of the sensitive jobs aided by Raytheon tubes, transistors and diodes.

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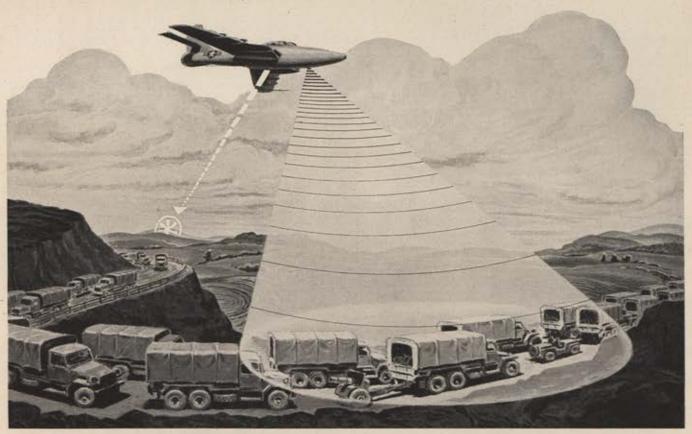
Raytheon's record in designing reliable electronic products for home, industry and the armed forces is, in substantial part, due to its pre-eminence in tubes and transistors.

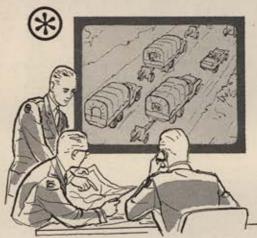
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"Oh, I'm going to a better land— They jazz there every night; Bourbon grows on the bushes, So everyone stays tight.

"They've torn up all the calendars, They've busted all the clocks, And little drops of whiskey, Come trickling down the rocks."

The pilot breathed these last few words Before he passed away: "Now let me tell you how it happened— My flippers wouldn't stay.

"The engine wouldn't hit at all,
The struts were far too few;
A bullet hit the gas tank,
And the gas came leaking through.

"Oh, I'm going to a better land, Where the engines always run, Where eggnogs grow on eggplants, And the pilots grow a bun.

"They've got no Sops, they've got no Spads, They've got no Flaming Fours; And great big frosted juleps, Are served free in all the stores."

With the outbreak of World War II, this song was updated and sung by the Air Force throughout the world. Here's a version from the Fifteenth Air Force in Italy. They called it "Beneath A Bridge in Sicily." Its ancestry is obvious.

BENEATH A BRIDGE IN SICILY

Beneath a bridge in Sicily, One cold and wintry day, Beside a busted fighter plane, Its former pilot lay.

His throat was cut by a bracing wire, The gas tank had hit his head; And he listened to these dying words, His young observer said:

"We're going to a better land, Where everything is bright; Where money grows on bushes, And you shack up every night.

"You never have to work at all, Not even to change your socks; And little drops of whiskey, Come trickling down the rocks."

Then the pilot muttered a last few words, Before he passed away: "I'll tell you how it happened— The propeller ran away.

"The engine wouldn't hit at all, The gas was far too few; Then a bullet hit the gas tank, And the gas came leaking through. "Oh, I'm going to a better land, Where engines always run; Where eggnogs grow on eggplants, And pilots grow a bun,

"They have no interceptors, No Junkers thirty-four, And great big frosted juleps Are free in every store."

The observer said to the pilot, As heavenward they flew, "Now, when we see Saint Peter, I'll tell you what we'll do—

"We'll get ourselves some brand new wings, And back to earth we'll fly; And we'll haunt those lousy krauts, Until the day they die.

"Oh, we're going to a better land, We'll jazz there every night, And the cocktails grow on bushes, So every one stays tight,

"They've torn up all the calendars, They've busted all the clocks, And scotch and rye and bourbon Come flowing down the rocks."

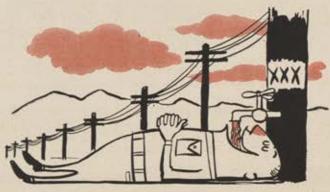
The Korean brawl naturally created its versions of the song. By then all elements of technical vocabulary dating back to either the first or second World War had been eliminated. These versions were strictly "new" Air Force—an Air Force that maintained and flew jet-powered aircraft and that spoke of "burners" and "tail pipes" rather than "cylinders" and "crank shafts."

Here's one of the Frozen Chosen versions, "Beside A Korean Waterfall," once again sung to the basic tune.

BESIDE A KOREAN WATERFALL

Beside a Korean waterfall, One bright and sunny day, Beside a shattered Sabre, A young pursuiter lay.

His parachute hung from a nearby tree, He was not yet quite dead, So listen to the very last words, The young pursuiter said: (Continued on following page)



"I'm going to a better land, Where everything is right; Where whiskey flows from telegraph poles, And there's poker every night.

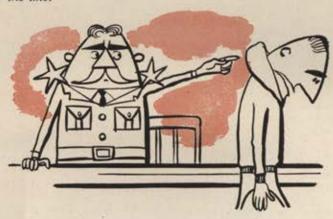
"There, there isn't a single thing to do, But sit around and sing; And all the crews are women— Oh, Death, where is thy sting?

"Oh, Death, where is thy sting? Oh, Death, where is thy sting? The bells of hell will ring ding-a-ling— For you but not for me!"

Strangely enough, the last element of this particular song dates back to World War I where it was in no way associated with the "Dying Hobo" series of parodies. It was a song unto itself called "The Bells of Hell Go Ting-A-Ling-A-Ling." How the two ditties paired up in Korea, I have absolutely no idea.

As should be obvious there are as many versions of a folk song as there are people who sing it. These versions are as good or as bad as the taste and ability of the individual singer or parody-maker. However, as in most folk art, the ability of the creator isn't as important as what is being said, how much the song affects, pertains to, or amuses the individual audience.

Consider the extremely popular "Down the Ruhr Valley" of World War II and the later parody from Korea, "K-14 Tower," based upon it. Both are sung to the tune of "Down in the Valley." Both, in their way, say something; both deal with immediate and definite realities; both are true folk songs—as honest and sincere as more celebrated songs such as "The Cowboy's Lament," "Birmingham Jail," and the like.

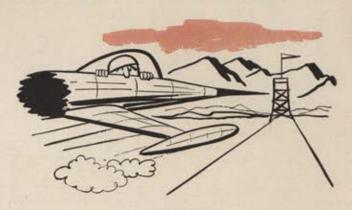


DOWN THE RUHR VALLEY

Down the Ruhr Valley, Valley so low, Some chair-borne bastard, Said we must go.

Flak loves big bombers, Fighters do, too, P-51 boys, Where are you?

Write me a letter, Send it to me, Send it in care of, Stalag Luft Three.



K-14 TOWER

K-14 tower, I'm going in, North of the airdrome, Augering in.

Call out your crash trucks, Your meat wagon, too, Call out the chaplain, I'm feeling so blue.

Take heed, Junior Birdmen, This tale of remorse, An airplane can throw you, As quick as a horse.

A sampling like this could go on and on. The songs given here are but a few examples from a collection of over 400 such parodies collected over a twelve-year period from Air Force personnel in England, Italy, Russia, Japan, Okinawa, Korea, and the United States.

The songs I have collected, I believe, are a definite part of America's cultural heritage—as important as are the songs and parodies of lumberjacks and hoboes, sailors and mountain-locked hill-billiys, all of which have been collected and preserved. Our songs, too, should be preserved. Already, all too many are lost forever—forgotten by those who had no immediate purpose in remembering and never known by those who came later.

Just the same, there are still a lot of the good old songs kicking around. Pull up a beer and listen in next stag night at any fighter base's officers' club—drop around, come the next nickel-night at the nearest NCO Club. You'll hear songs, songs of other days, of wars and places and planes and people—sardonic songs and sad ones, happy songs and songs that thumb their nose to all the world outside the fraternity of flight.

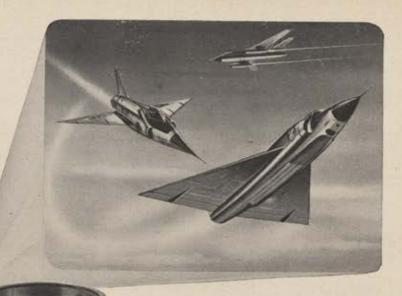
Just as long as there is an Air Force—an Air Force that is not strictly push-button but one with ground and aircrews composed of flesh and blood—the old songs will live on. They're part of the Air Force. They are Air Force.—End

ABOUT THE AUTHOR

Bill Wallrich, whose byline has appeared twice before in Air Force ("Bedcheck Charlie," September '53, and "Air Force Slang," September '54), is now in AF public information at Willow Run Airport, Mich. Those interested in Air Force songs will be glad to know about the 72-page compilation an Air Force librarian at Ardmore AFB, Okla., has assembled. The handsomely illustrated, bound book is the work of Miss Logan Bentley, who writes us that she'll be "delighted to send copies out while they last."

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At Wright-Patterson AFB the author gets "checked-out" on a jet ejection seat by S/Sgt. Norman Murphy of Piqua , Ohio.

ANY women have heard the facts of life, good and bad rumors, news of an errant husband, choice gossip, and various other things in beauty shop conversations.

In my case, however, a conversation among three women led me to a flight through the sonic barrier—the first woman passenger to do this.

The conversation was prompted by newspaper accounts last spring of the Air Force Association's Jet Age Conference in Washington, which had been heavy on the problems of noise and the irritability of the citizen especially, the woman citizen. The chit-chat went on from there, and one of the women said:

"No matter what my son wants, I don't want him anywhere near the Air Force. Those jets are too dangerous."

It appeared that womanhood, closest to home, family, and security-the very things that profit most from the protection airpower gives us—weren't prepared to help keep it strong enough to avert war.

As a broadcaster primarily looking for human interest and public service type programs, I was not prepared to tackle the problem. But I could encourage other women to talk, and then listen carefully to what they said, which I did.

In the ensuing weeks I listened to many mothers who feared Air Force service for their sons and to complaints of noise from mothers with babies.

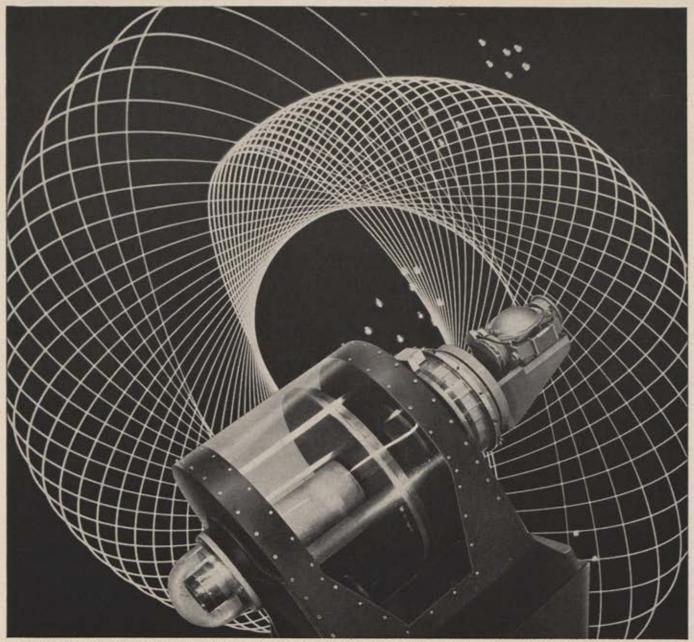
Some shrugged and said there was no way to head off the Russians if they decided to come; others, that there was no reason to believe the Soviet Union would ever attack us. Some said there could be no real family life in such a migratory existence as the Air Force, that there was a lack of religious guidance in military service, and that an Air Force career might be all right for some, but "not my son, thank you!"

It seemed to me that air defense had the closest kinship with a woman. It is as close as the front yard, and it must live among us. So I decided to write the following letter to Headquarters, Continental Air Defense Command, Colorado Springs, Colo.:

"Not long ago, I heard some women talking about why they did not want their sons to be in the Air Force. They said that jets were dangerous, and did not want their sons in or near them.

"It seems to me with all the things the Air Force has in the way of responsibilities for our national protection that it should not have to unnecessarily suffer mother antipathy toward jet flying and housewife complaints

(Continued on page 117)



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Man has made a flying brain

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Some aircraft being built today are too fast for a man to fly alone. Some of them he can't navigate ... one inch off course for an instant can mean a mile off course in a minute. Some of them he can't fight with...if he sees a target, by the time he presses a trigger, the target has been passed.

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of jet noise while meeting those bigger responsibilities.

"Then, from my own lack of knowledge and talks with others who are business and professional women as well as housewives, I found we women know appallingly little about the Air Force; what it's like, why it has to do what it does, and what its problems are.

"Therefore, I would like to do a series of broadcasts over a period of thirteen weeks at least, and maybe twenty-six, built around the theme of this year's Air Force observance of 'A Decade of Security Through Global Airpower.' One of the things I want to do to dramatize for all women the safety factors, the degree of preparation and training of airmen is to take a jet ride and if conditions are right and you agree . . . to approach or go through the sonic barrier.

"If this is done by a woman who is a housewife—and I explain all the details of how I was prepared for it—I don't see how women can fail to see that their fears are in error."

There was a long delay, and for a while I thought that my request to go through the sonic barrier would be regarded as a "publicity stunt." I didn't know that no woman had gone through as a passanger.

But I had made up my mind on a couple of things:

 Material available, I was going to do the broadcasts on the relationship of women to airpower's problems, and why they had much to gain by helping to solve them.

 If I were to make any headway in convincing the women who listened to me, I would have to have as complete a jet experience as the Air Force would be willing to provide me.

Before I received an answer to my letter, the AF monitored my broadcast for a few days. They told me later they were relieved that my program had nothing to do with cake mixes, recipes, or the growing of dahlias, but was geared to human interest.

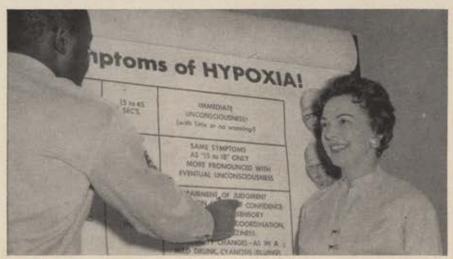
Then the AF asked me to outline my programs, and what I would need to get the Air Force story into terms a woman could understand and would listen to.

As a first step, I had to see my family doctor, the man who knew my case history well and who could certify me to be healthy.

The Air Force took over and at Wright-Patterson AFB, Ohio, along with several jet pilots who had seen service in Korea, I joined a lecture course and was "talked into" what



Up to 43,000 feet in the pressure chamber of the Physiological Training Unit.



A/1C Jesse L. Gamble discusses effects and symptoms of hypoxia with author.

could be expected along the way.

A/IC Jesse L. Gamble, of Omaha,
Tex., discussed the sea level air pressure and outlined "the chokes,"
"bends," the dangers of eating leafy or gas-producing vegetables before ascent. I was also briefed on the dangers of hypoxia (lack of oxygen) at high altitudes. In this strange new world of bail-out and walk-around oxygen bottles, I found that life can really depend on sure knowledge of their uses.

The extreme care with which the Air Force trains its people impressed me. In the old stories of flying, it had seemed to me that pilots tended toward boldness, even foolhardiness. Didn't the Air Force song even tell of the wild blue yonder, going off with "a helluva roar," and living in fame and dying in flames? The Air Force song, I was finding, was born of another era when boldness and foolhardiness were accepted.

In 1921, for every 100,000 hours flown there were 467 accidents. This was in the 100-mile-an-hour era. Now that speed-of-sound flying was common, the Air Defense Command had reduced its accident rate to eighteen

(Continued on following page)



Strapping on a note pad for jotting down details of the supersonic ride.



1st Lt. Charles L. Beneze says its going to be a wonderful experience.

ABOUT THE AUTHOR

Let's face it—women play an important and powerful part in our society. DelVina Wheeldon, Women's Director and commentator for radio station WCKY in Cincinnati, Ohio, knows this, and, because she felt the Air Force was missing a bet in not telling its story directly to the women, she decided to do something about it. Thus began the series of events that led up to the flight she tells about in this story. "Never underestimate the power . . ." etc., we might add.

per 100,000 hours in 1955. And the trend was going down still further, I was told.

As my lectures and orientations progressed, and the seriousness with which the instructions were taken by the old-hand pilots, it seemed to me that they were interested in taking the "wild" out of that blue yonder, that the "helluva roar" was not with us in the spirit of the kid who takes the muffler off his jalopy to annoy the neighborhood but for purposes of naked power to get up quickly to do battle.

The challenge of presenting the Air Force in truer light never seemed more necessary than now, and particularly to the women who had so much to give in the way of help and understanding, and who had so much to lose if we did not have this well trained Air Force.

"If we can get across a few simple things," said Capt. Thomas H. Mowry, who runs the pressure chamber to which we were committed after the lectures, "you will see that the Air Force takes no unnecessary chances, and leaves nothing to chance. If man had been intended to fly, he would have been born with feathers, but by making certain adjustments and taking protective steps, there's no reason why he can't fly, in safety, and keep our country safer in the process."

When we were taken to the pressure chamber, each of us was fitted with a skullcap-like helmet and an oxygen mask. My tape recorder was piped into the communications system so I could ask about things which puzzled me, and to enable my listeners to share the events in the pressure chamber with me when it was later broadcast.

was later broadcast.

At 35,000 feet, they put a cribbage board in front of me with a series of pegs in it so colored that it would be possible to pull them out, turn them half way around, and re-set them.

On Captain Mowry's signal, I started to do this when my oxygen connection was broken. A minute and ten seconds later I was three-quarters of the way through the task. Then my eyes grew fuzzy, and my head began to spin slightly. I was fully conscious, it seemed to me, but I found my joints—shoulders, elbows, wrists, fingers—were locked. I could see they were locked, but could do nothing about it. Almost immediately my oxygen was re-connected and turned up full. I began going the rest of the way through the peg-setting.

"How were your sensations?" I heard Captain Mowry ask. "What sensations?" I asked him stu-

"Didn't you know you were frozen in place?" he said. I was still merrily setting pegs, and thought he was off his rocker. It seems that the hypoxia victim, on recovery, picks up automatically where he leaves off and does the things he was doing before the insidious effects set in.

The lectures, the briefings, the interviews, the interminable talks went on, and the tape recorder spun as I asked questions I felt every woman would want to or should know.

The job of continental air defense, like all Air Force missions, depends on men being in uniform and staying in uniform. When I talked with Brig. Gen. Arno Luehman, head of USAF recruiting, he said parental opposition to Air Force careers for their offspring usually fell in two categories-fears of mothers about their sons' being in jets, and lack of religious guidance when they get away from home. He pointed out the infrequency of jet accidents, talked about the constant fight to lower the rate of accidents, and said that there is more church attendance in the service than outside because it's the "adult thing to do to go to church on your own, rather than because Mom wants it.'

I had heard there was no family life worth having in the Air Force, and then I met the O'Hara's, as Irish as the name implies, and as happy a brood as I have ever seen. Maj. David O'Hara is a jet pilot; his wife, a former school teacher, and they have a boy and a girl. Their youngsters have been all over the world, have had no adjustment troubles, and are looking forward to more going with an eagerness and poise that is refreshing.

By the time I walked to the plane at Wright-Patterson on May 12, 1956, in full flying suit regalia and with a miniature wire recorder spliced into the intercom system, jet flying was no longer a thrill-chasing thing to me. My mind was a whirl of figures, all of which made more and more sense.

The pilot, 1st Lt. Robert Kline, of Indiana, Penna., and of the 319th Fighter-Interceptor Squadron out of Bunker Hill AFB, Ind., wanted this flight to be a valid "mock scramble" to get me even more into the atmosphere in which our airmen work and watch. The plane had been backed into one of the Wright-Patterson alert hangars and the doors were closed.

Then, the squawker!

There was a clatter of feet over the cement floor. An auxiliary engine (Continued on page 121)

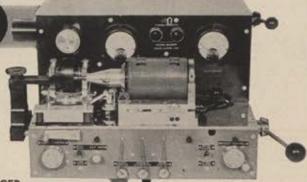
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without removing the rotor from the mount

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The Lockheed F-94 Starfire rolls out of the alert hangar. 1st. Lt. Robert Kline, of Indiana, Penna., is the pilot.

started, the electric motors hummed as the alert hangar doors swung out and up, the plane became alive under me as the engine caught, and we were rolling hard for the take-off end of the runway. Things happened so fast that we were skimming down the cement strip one minute and by the time I had looked around a few times, I heard Lieutenant Kline reporting us at 20,000 feet and still going up.

Our destination was Lake Erie, where the noise booming off our nose would bother no one. Lieutenant Kline soon reported back to the tower that he was at 48,000 feet, leveled off, and was ready to tip it over for the dive. I had the feeling then of being in an awesome cathedral, as if the spoken voice had organ tones. Thenover we went. We were too high for me to sense any rate of closure with the lake. My eyes were on the indicator where Lieutenant Kline had told me to watch the needle. At a certain point I would know we were at Mach One, the speed of sound.

The needle hit Mach One, and a tremor went through the plane. That was all there was to it.

We pulled out at 18,000 feet.

Lieutenant Kline said, "You have just gone 830 miles an hour. I could give it to you in knots, but it would only confuse you."

Strangely, I had felt safer with this twenty-six-year-old lieutenant — going faster than sound, knowing the training and preparation he had as well as how I had been set up for the event — than I did in my own neighborhood in Cincinnati where the kids rip around in hot rods. Being a broadcaster, where voice means a lot, I realized that the calmness of tone of this lieutenant could only come from one who knows his business and in-

stinctively does things right from long practice. I felt our country was much, much safer than I had ever thought because it was in the hands of men like him.

The return was orderly, and quick. As I stepped down, I could not help wondering what all the mother fuss was about. How many of them would better commit their youngsters to jet pilot instruction, and an Air Force career, rather than succumb to their pestering and pouting to get behind the wheel of the family car with no training at all and with the competitive urge to outrun everything on the street or highway!

Waiting for me to land was a certificate making me a "jet jockey." A few days later, a telegram from Burt English of the Aircraft Industries Association told me I was "the first woman passenger to go through the sonic barrier but only one of many women passengers of the future who will know supersonic flight as aviation progresses."

I hope that the Air Force will make similar experiences available to more women, because I know one of the biggest public relations problems of the Air Force is the "community of women." Very little has been done so far to bring this community of women around to a full-scale alliance with the USAF purposes and aims.

I had made my flight the day before Mother's Day. I will never forget something I heard one of the Cincinnati newscasters say that night:

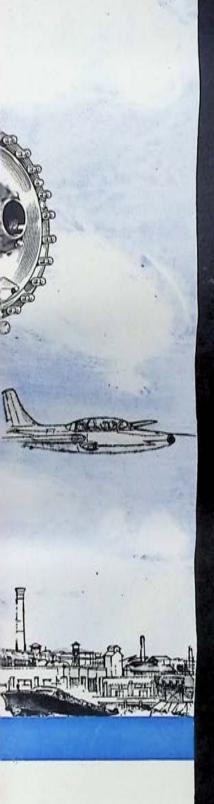
"And our DelVina gave mothers their most unusual Mother's Day present of all this year—the present of reassurance."—END



DelVina Wheeldon becomes the first woman passenger to go faster than sound.



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An AIR FORCE Magazine Photochart REVISED AS OF JUNE 15, 1956

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8th Air Force Maj. Gen. Walter C. Sweeney, Jr. Hq., Westover AFB, Mass.



15th Air Force Maj. Gen. Archie J. Old, Jr. Hq., March AFB, Calif.



3rd Air Force Maj. Gen. Roscoe C. Wilson Hq., Middlesex, England



12th Air Force Maj. Gen. John K. Gerhart Hq., Ramstein AB, Germany



17th Air Force Brig. Gen. Richard J. O'Keefe Hq., Rabat, French Morocco



Air Materiel Force, European Area Maj. Gen. William T. Hefley Hq., Wiesbaden AB, Germany



5th Air Force Maj. Gen. Frederic H. Smith, Jr. Hq., Nagoya AB, Japan



13th Air Force Brig. Gen. William L. Lee Hq., Clark AFB, Luzon, P. I.



Pacific Air Force Maj. Gen. Sory Smith Hq., Hickam AFB, Oahu, T. H.



7th Air Force Brig. Gen. Julian M. Chappell Hq., Wheeler AFB, Oahu, T. H.



Pacific Area
Brig. Gen. William T. Hudnell
Hq., Tachikawa AB, Japan



9th Air Force Maj. Gen. Edward J. Timberlake Hq., Shaw AFB, S. C.



18th Air Force Maj, Gen. Chester E. McCarty Hq., Donaldson AFB, S. C.



19th Air Force Brig. Gen. Henry Viccellio Hq., Foster AFB, Tex.



Flying Training Air Force Maj. Gen. Gabriel P. Disosway Hq., Waco, Tex.



Technical Training Air Force Maj. Gen. Carl A. Brandt Hq., Gulfport, Miss.



Crew Training Air Force Maj. Gen. Frank H. Robinson Hq., Randolph AFB, Tex.



Food inspection is the vet's chief job. From left: Dr. R. W. Brown, Dr. L. O. Mott-Agriculture Department; Brig. Gen. Wayne O. Kester, AF Chief Vet.

WHY THE AIR FORCE

NEEDS ITS

VETERINARIANS

Unlike his civilian counterpart, the service vet is primarily concerned with food sanitation and inspection, research, and public health

N MID-MAY Secretary of Defense Charles Wilson decided that the Veterinary Corps of the Air Force, and of the Army as well, should be abolished by decree. He suggested in a memo that their functions should be discontinued, reassigned, or obtained by contract.

Mr. Wilson gave the Air Force and the Army until July 1 to come up with a plan to carry out his order. As the deadline passed, the services were still working to solve this knotty problem and conform to the Secretary's orders.

Meanwhile, the career veterinarians—and there are about 300 officers alone in the Air Force, besides 600 airman technicians—found allies on Capitol Hill.

The Congressmen say the Veterinary Corps was established by Congress as part of several specific acts involving personnel, compensation, and organization—and that only Congress can abolish what it has previously authorized. They point out that if the Secretary of Defense is permitted to abolish the veterinarians on his power alone, he might well do away with part of the Reserve program at some future date, or fire out an order aimed at some other part of the services.

The Congressman championing this line of reason is Rep. Carl Vinson, Democrat of Georgia, Chairman of the House Committee on Armed Services. He has publicly taken issue with Mr. Wilson on the legality, as well as the judgment, of his action and has asked Mr. Wilson to report to the Committees on Armed Services so the members can be fully informed as to the justification of action contemplated.

As Congress neared the end of its current session, it seemed problematical whether such a report would be made by the Secretary of Defense at this session, or be deferred until Congress convenes next January.

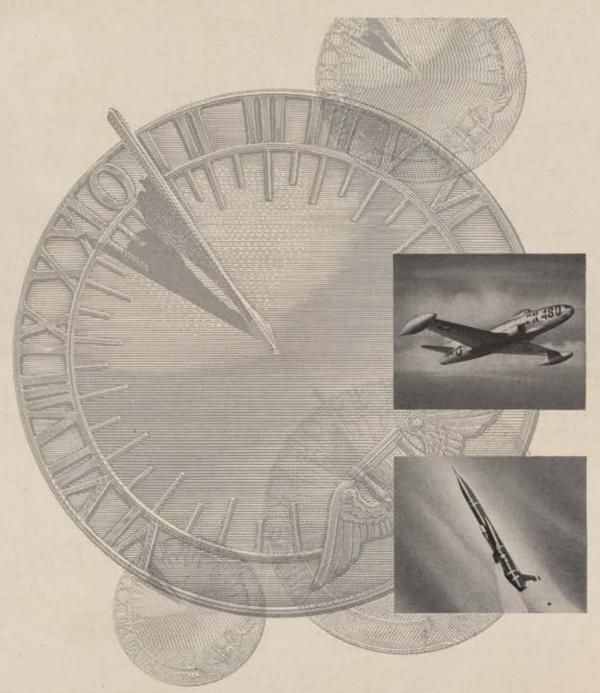
Meanwhile, those who favor retaining veterinarians in the armed forces base their arguments on the actual services performed by these trained men, rather than the imagined functions usually associated with them, such as care of horses or other animals. In his original order Mr. Wilson stated that civilian veterinarians should care for public animals.

As a matter of record the horse hasn't been a factor in the veterinarians' duties for forty years. The last time the horse figured importantly in a major war was during World War I, and even then less than half of the veterinarians' efforts were expended on them while most of their duties were

(Continued on page 133)



General Kester at Beltsville. AF vets work closely with Agriculture Dept.

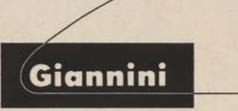


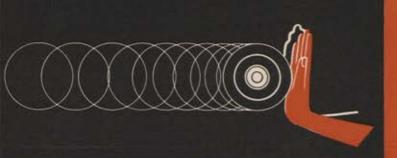


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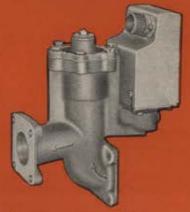
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VETERINARIAN____CONTINUED

directed toward food sanitation.

Air Force veterinarians have four

principal responsibilities. Inspection of food heads the list. The others cover research and development, preventive medicine, and public health. Fourth, and last, are duties pertaining to both public and privately owned animals.

Wherever an airman may serve, either in the States or overseas, vet-inarians are on duty to check all foods and food supplies served in dining halls or sold through any outlets on the base or installation. Some veterinarians go beyond the boundaries of the military reservations and check on foods sold or served at civilian places where airmen are likely to go. Food service inspection is the veterinarian's principal duty, and the progressively improving health of all Air Force members over the years can be credited in large measure to this factor.

In food inspection the Air Force veterinarians work closely with Army and Department of Agriculture officials to avoid duplication of effort. The Quartermaster General of the Army is charged with procurement of all foods used by the armed forces. The Air Force veterinarian is relied upon to prevent contamination, hidden deterioration, spoilage, unsound food practices, and purchase of poor quality foods.

Conscientious checking saves millions of dollars, unaccountable man hours, and even lives. The services have left far behind the days when poor food and foodborne diseases caused more casualties than did the armed enemy.

Secretary Wilson's order said that inspection and grading services should be obtained from the Department of Agriculture. The Air Force does work with Agriculture in many places in the United States, as has been pointed out. But there are no Department of Agriculture agents outside the United States, and almost daily the Air Force becomes more global, with its personnel now assigned in approximately thirty countries and more and more units of its combat commands rotating for sixty-day training tours in foreign climes.

Another essential point, frequently overlooked, is the fact that the Air Force, like the other services, is primarily a training organization and must of necessity under certain conditions become self-sustaining and be directed almost entirely from within.

It might casually appear that certain items requiring a highly technical or specialized inspection could be handled perhaps with greater economy outside the military. For example,

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would it be reasonable to use civilian engineers or commercial pilots for Air Force assignments? Degree of military effectiveness in time of actual need—wartime, of course—would be lessened considerably and perhaps fatally.

In his abolishment order of mid-May Secretary Wilson made no reference to one of the most important and interesting functions performed by Air Force veterinarians—in the research and development field.

Teamed with other medical officers and research scientists, the veterinarians constantly work on problems concerning food, nutrition, in-flight feeding, and foodborne diseases. He has helped prepare the banana puree which a flyer sips during a high-altitude, long-distance hop.

He is in the aviation medicine laboratory, contributing technical assistance to tough problems of space medicine. Veterinarians receive regular duty tours at research and development laboratories, where they translate their special knowledge to experiment in the wide open field of aviation medicine.

For example, take Lt. Col. John Stapp's rocket sled deceleration experiments, conducted in the interests of safe ejection of pilots from planes flying at high speeds. Before Stapp himself made the trial runs on his sled in the Mojave Desert, he used chimpanzees to ascertain reactions at various speeds. Standing by was an Air Force veterinarian, who has a major responsibility wherever animals are used in Air Force experiments.

Veterinarians must make sure that the correct animals are used for specific tests. They must see that the animals are properly housed and maintained in perfect health. The veterinarian, of all people, is best qualified to interpret experimental results in which animals are used. Besides the chimpanzee, the Air Force testing family includes space rats used on high-altitude balloon flights, mice and rabbits used in space medicine experiments, and others.

Veterinarians team up with sanitary and industrial hygiene engineers in the field of public health. They work under the direction of flight surgeons to solve sanitary inspection problems necessary to maintain proper standards of environmental health and sanitation on and near Air Force bases.

Secretary Wilson has stated that medical care for public animals ought to be provided by civilian veterinarians. This could work out well in many cases but not in all of them.

One of the Air Force veterinarians' (Continued on following page)

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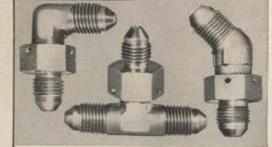
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VETERINARIAN_____CONTINUED

responsibilities is the prevention and control of diseases among small and large animals on or near the base. Pets are inoculated against rabies. Other diseases—particularly in foreign lands—can begin when a pet or other animal is brought on the base, and then spread to create great distress. Veterinarians provide safeguards before the fact. The barn door is locked tight before the contaminated mules scamper out.

Since Air Force personnel are modern-day Magellans with their worldwide assignments, and usually carry their livestock with them from one location to another, veterinarians are on constant alert for an exotic disease which might well be flown into this country on an airplane.

One clue to the veterinarian's important operations in the Air Force is his close relationship to the Air Force Medical Service. Not a separate service itself, the veterinarians are under the direction of the Surgeon General, Maj. Gen. Dan C. Ogle.

The educational level of AF veterinarians is unusually high—their official title is Doctor of Veterinary Medicine. Each veterinarian has a minimum of six years' college training (most of them have seven to nine years), and many have a degree in public health. Airman technicians in this field are graduates of a special course in the School of Aviation Medicine, at Gunter AFB, Ala.

The veterinary field is not crowded. There is a large turnover of officers each year for a variety of reasons. Outside the service these veterinary specialists are in heavy demand by private industry.

Strong efforts by Brig. Gen. Wayne O. Kester, the Air Force's chief veterinarian, to raise the level of prestige and service in his profession has paid handsome dividends not only for himself but also for those who work with him. The profession has given him formal recognition by choosing him the next president of the American Veterinary Medical Association. General Kester was in the Regular Army Veterinary Corps starting back in 1933 and has been a leader in this profession ever since. During World War II all of his duty was with the headquarters for forces in the Pacific Ocean Areas, where health was high under very unusual situations.

In the current dispute over this service, the individual serviceman has an important stake in the outcome. In the Air Force his very life in this fast-moving Jet Age may depend on how well the man with veterinary responsibilities does his job.—End

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In London's St. Clement's Church . . .

The Bells Will Ring Again

By Lee Klein



Restoration begins on St. Clement Danes.



Close-up of all that is left of the altar.



The roofless, burned-out shell of the nave of the church after bombing by the Germans in May 1941.



Altar of the church showing decay before the restoration work was begun.



Architect's drawing showing how interior of RAF church will look when restoration is complete. About \$350,000 will be required to finance the restoration.

NE NIGHT in May 1941, a German fire bomb whistled down in the Strand, near the Law Courts in London, and exploded in a flaming inferno. And in a matter of moments, one of Christopher Wren's architectural masterpieces, with a tradition going back more than a thousand years, was reduced to a scarred shell and a tower.

To Londoners, the loss was something very personal. For when the flames ruined lovely historic St. Clement Danes Church, its ten bells crashed to the ground and no longer pealed out this centuries-old nursery rhyme, familiar to so many thousands of Londoners:

"Oranges and lemons, say the bells of St. Clemen's;

You owe me five farthings, say the bells of St. Martin's;

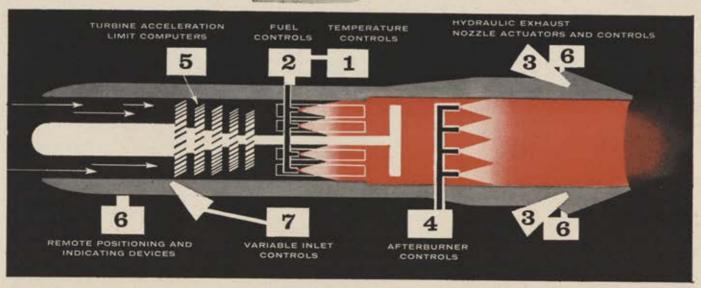
When will you pay me? say the bells of Old Bailey;

When I grow rich, say the bells of Shoreditch;

When will that be? say the bells of Stepney;

(Continued on page 138)

CONTROL SYSTEMS FOR ADVANCED JET ENGINES



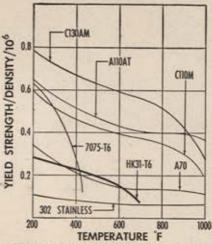
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I do not know, says the great bell of Bow."

But, the bells will soon ring out again. By agreement between the Diocese of London and the Air Council, the church is to be restored as the church of the Royal Air Force, both as a living place of worship and as a perpetual shrine to the courage and sacrifice of RAF airmen through two World Wars. It is estimated that \$350,000 will be required for restoration, redecoration, and refurnishing—and since no public money may be spent, the RAF must raise this amount by voluntary contributions.

When Maj. Gen. Roscoe C. Wilson, Commander of the Third Air Force in England, heard about the plan, he proposed that USAF personnel stationed there should provide the organ for the church as a memorial to the USAF men who died while serving in that area during World War II. The sum needed for the organ is about \$75,000-quite a large amount for the personnel stationed in England to raise. The general felt, and we agreed, that many Americans stationed there in the past would also like to contribute. So pass the word along and send your contributions to: St. Clement Danes Fund, Air Force Association, Mills Building, 17th & Penna. Ave., N.W., Washington 6, D. C. We will forward all contributions to General Wilson's headquarters.

The old church has a long history. Named for St. Clement, a pupil of St. Peter, who, according to tradition, was martyred in 100 AD by being tied to an anchor and dropped into the sea, the original church was probably built during the reign of Alfred the Great (871-901), who threw the Danes out of London. Some of them, married to English women, settled near the site of the present church between the cities of London and Westminster.

Two centuries later the church was restored by William the Conqueror. Rebuilt again in the Middle Ages, the church just barely escaped the Great Fire of London in 1666. Fourteen years later, however, it had to be torn down, all except the tower, the stump of which still survives within the later steeple. In 1680-82 the great architect, Christopher Wren, built the church which survived until the World War II bombing. The elaborate steeple was added in 1719—the work of another famous architect, James Gibbs.

The "Oranges and Lemons" jingle dates back to the time when fruit was brought up the river in barges and unloaded on the steps below the

church. The fruit was carried through Clement's Inn, where a toll was extracted, and taken to Clare Market. While the fruit goes to market by a different route today, the old custom has survived. Each New Year's Eve. the servants of Clement's Inn used to carry oranges and lemons to the residents of the chambers, for which they would collect half a crown as the bells rang in the New Year. More recently, the bells played the "Oranges and Lemons" tune three times daily and at special services for children as the fruit was handed to them as they left the church.

Although the restored church will be an RAF church, and no longer an ordinary parish, the oranges and lemons custom will be preserved and the bells will once again peal out their joyful message to the thousands of Londoners who pass by St. Clement Danes in the Strand every day.

A Roll of Honor in the church will commemorate the name of every airman and airwoman who was killed or who died while serving the RAF from its beginning, through two World Wars and thereafter. And for American relatives and friends of the wardead, the shrine will be a link with the past. Beside the organ donated by their fellow countrymen, they will be able to read the names of US Air Force officers and airmen who lost their lives while serving in Great Britain—End



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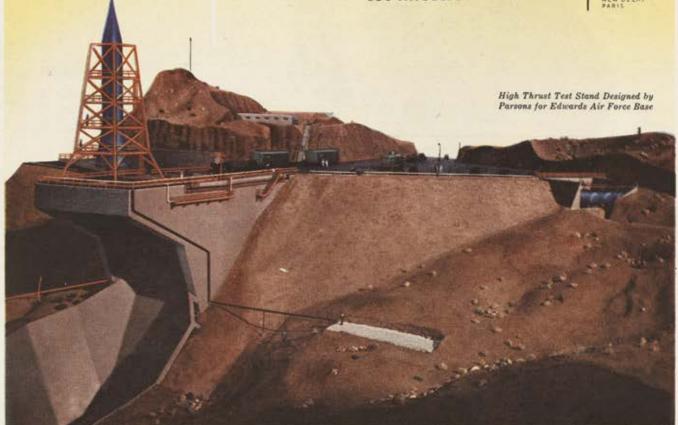


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By Jim Winchester

Photography by George Burns



Sergeant Oakes (left) and Airman Ritter at McGuire AFB.



Sergeant Oakes and the MATS pilot go over the route map with a passenger.



High over the Atlantic, the girls fix a hot meal for passengers on the C-118.

SOT. LILA OAKES and A/1C Leota Ritter are as trim and pert a pair of WAFs as there are in the United States Air Force. Show them an office with four walls, a five-day week, and the nicest boss in the world—well, they'll send you a post card from Paris or Saudi Arabia saving. "No, thanks."

As high-flying flight attendants with the global Military Air Transport Service, winging off from McGuire Air Force Base in New Jersey to strange and exotic aerial ports of the world, their office is in the skies above four continents, their restless feet as much at home on Paris's Champs Elysees as on Tokyo's Ginza. They're as familiar with the hotels of Casablanca as they are with the pyramids outside Cairo. A five-day week? They fly less than 100 hours a month.

"We've got it made," they say.

What's more, their work is a panacea for practically all the gripes from girls who hold down more prosaic desk jobs on the ground. When vacation time rolls around, they never have to ask themselves, "Where shall I go?" Their problem is, "Where haven't I been?"

The military equivalent of civilian airline stewardesses, Lila and Leota between them have rolled up more than half a million miles of air travel, chalked up better than 6,000 hours aloft. Clothes are no problem for these peripatetic WAFs. With the leading shops of the world to choose from, their wardrobes are truly cosmopolitan, including, as they do, lace scanties from Paris, hand-embroidered blouses from Spain, tweed suits from Scotland, cashmere sweaters from Bermuda, silken saris from India, jewelry from Lisbon, perfume from Nice, and even fur rugs from Greenland for their barracks rooms.

While there is plenty of travel and sightseeing, shopping and time-off for flight attendants, there is also plenty of hard, exhausting work. A pair of indefatigable feet are indispensable to the job.

"I've walked from New York to Paris a half dozen times," says Airman Ritter, who has been flying on MATS's

North Atlantic runs for four years.

Places, like people, are of never-failing interest to these two girls. Sergeant Oakes, dark-eyed, dark-haired, easily one of the most traveled young women in the Air Force, has circled the world for MATS. Since 1952 she's flown on all three MAT6 divisions—Continental, Pacific, and Atlantic, And any leave finds her winging off somewhere else—Jerusalem, Hong Kong, or Rio's beaches.

Both agree, however, that Paris is their favorite city. On the round-trip Paris flight, caring for four dozen or

(Continued on following page)



Sightseeing and shopping takes up ten of the thirty-one hours the girls have in Paris. Here a helpful policeman gives them directions.

A Parisian perfume shop is always a favorite stop. The obliging shop owner sprays a sample on Sergeant Oakes's wrist. The girls wound up buying an ounce each.





You don't leave Paris without a picture of the Eiffel Tower. This suits Sergeant Oakes fine, She's a great camera fan, with still and motion pictures from all over the world. At right, the girls walk along the Seine on their way back to the hotel after shopping.

more passengers each way, the girls take off from McGuire on a Douglas C-118 at noon, stop in Newfoundland, then go on non-stop to the French capital. With the rest of the crew they're billeted at the Air Force's Hotel Powers, just off the Champs Elysees. After eight hours of sleep and a round of sightseeing and shopping, they take off at five p.m. the following day, stopping en route at the Azores and Newfoundland, on the trip back to McGuire. Other Atlantic Division MATS flights-which Lila and Leota, along with the more than 130 other WAF flight attendants assigned to McGuire, also work-go to Great Britain, Germany, Africa, Saudi Arabia, Greenland, Canada, and South America. Pacific Division WAFs, headquartered in Honolulu, fly to Japan, the Philippines, throughout the Far East, and on around to meet the girls from McGuire in Saudi Arabia. No WAF is allowed to fly more than 120 hours in one month or 330 hours in any three months.



WAF flight attendants are comparatively new in the Air Force and the girls take a good deal of kidding. Most repeated is the remark, "Well, we didn't have crew mem-

bers like you in the last war."

MATS uses both WAF and male flight attendants, and the training is the same for both. WAFs may apply for such assignment upon completing their basic training. A girl must be at least eighteen years of age, a high school graduate, between 5' 2" and 5' 8" in height, personable, good-looking, and have a sincere desire to work with people. Those selected go to a flight attendants' school at Palm Beach AFB, Fla., for three weeks, then are assigned to transport squadrons.

Just as on the civilian airlines, the marital rate is high among these flying WAFs. However, if they desire, they can keep on flying after they're married. They have to get out of the service, though, if they have children. Five of the WAF flight attendants at McGuire, for instance, are married. One of them is Airman Ritter. Her husband, A/3C Richard Brown, is an instrument specialist in the Azores. Their dream is ultimately to be based together. Right now they see each other only two or three times a month when Leota's plane makes an hour's stop at Lajes. When her present six-year enlistment is up, Sergeant Ritter hopes to take a nurses' course, come back into the Air Force in that capacity.

"No marriage for me," says Sergeant Oakes. "Not right now, anyway. I'm having too interesting a time. Where else can I see the world, have lots of time off and still get paid enough to save half my salary every month?

"Yes, I'm a lucky girll"-END





One of the narrow streets of Paris' Left Bank is a good place for a stroll during the layover between flights.

On a walk along the Left Bank of the Seine, the two girls stop at one of the many outdoor art and book stalls along the riverside, A/1C Ritter examines some colorful prints.



On their rounds of sightseeing in Paris, the girls naturally included famed Notre Dame Cathedral, shown here in background.

In the Azores, Airman Ritter is greeted by her husband, A/3C Richard Brown. They meet only when her plane passes through.





Management Course at George Washington University

How the Air Force Learns from Business

By Lt. Col. Kenneth E. Kay

OE McBLOW had been with the company fifteen years and could operate or make emergency repairs on every machine in his shop. His foreman swore by him. When the plant expanded and the foreman was promoted, they gave his old job to Joe.

Inside a month the shop was in chaos. Employees were quitting, the grievance committee was swamped with complaints, and production had come to a virtual halt. Called in to explain, Joe was truculent and be-wildered, blaming everybody in the shop but himself, blaming every factor except those he controlled. Obviously Joe's trouble was that, although an excellent worker himself, he couldn't handle people and had been promoted beyond his capabilities.

Firing Joe would not only be unfair, but would cost the company a loyal and technically able employee. Demoting him to his old job would advertise his failure to everybody and deepen the psychological wounds Joe had already suffered, maybe destroying his usefulness completely.

What does Joe's boss do?

Problems of this sort, taken from actual records of American business and industry, are being studied by groups of experienced managers in seminar sessions at George Washington University, Washington, D. C. The idea isn't to solve the Joe McBlow dilemma—which is history now, buried in the files of some anonymous corporation—but to give these managers practice in group problem solving and a chance to compare their thinking with other managers.

Who are they? Up-and-coming young corporation executives? Tomorrow's tycoons of industry? Not at all. Plenty of companies are sending their bright boys to management schools these days, but at George Washington the hundred-man classes consist of Air Force colonels, lieutenant colonels, a sprinkling of top-grade Air Force civilians, and an occasional general. They come to George Washington's three-week-long Air Force Resources Management Program from Air Force combat and support organizations scattered across the nation to find out what American businessmen have learned about management.

What's Joe McBlow or the American businessman got to do with the United States Air Force?

Well, Joe represents a typical, if elementary, example of the problems with people that business managers have to solve all the time. One manager's troubles are much like another's, and the Air Force today is in the management business up to its ears.

A manager is a man who uses people, money, time, space, and equipment to achieve a desired end—a profit, if he's a businessman. To achieve its desired end—airpower of a quality and quantity to keep the peace—the Air Force uses exactly the same things.

 People. Nearly a million Americans wear Air Force blue. There are about 400,000 full-time civilian em-

ployees.

 Money. In Fiscal Year 1957 the Air Force budget will exceed \$16 billion.

 Time. In the Air Force this is a grim unknown, and the need for urgency influences every decision.

 Space. Runways, hangars, warehouses, shops, barracks, office buildings, hospitals, laboratories, an infinite

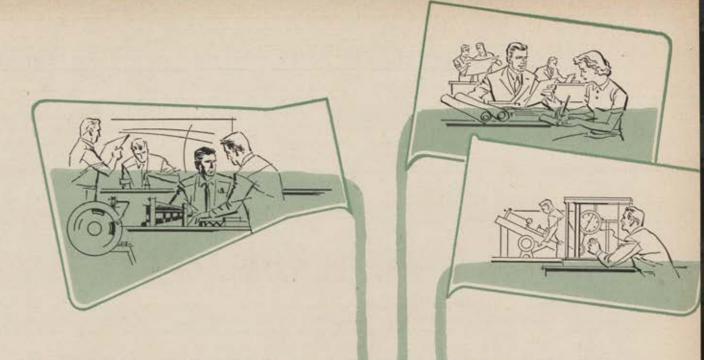
 Equipment. Aircraft, from obsolete World War II types still chugging faithfully along to fantastic experimental models streaking across the Mojave skies; weapons, from the jet pilot's lightweight aluminum .38-calibre pistol to thermonuclear devices; intricate communications and warning systems; vehicle and ground han-dling equipment; machines and instruments and tools beyond number; clothing, from Martian-looking anti-G. anti-exposure suits that aircrews wear at high altitude to ordinary buttons and shoelaces, and far, far more, stocklisted in catalogues so thick they make the operations of the whole Sears Roebuck chain look like the corner notions store.

Add training requirements of a magnitude and diversity undreamed of in industry—add the need for sparsest economy lest defense costs wreck America's economy and hand her enemies bloodless victory—add the awful consequences to the nation if the Air Force fails in business—and you see why Air Force officers must manage their resources as shrewdly as any businessman hustling to meet payrolls and make profits for stockholders. In the Air Force the term "manager" has become synonymous with "commander."

Back to Joe McBlow.

In different circumstances Joe could be a newly warranted staff sergeant, a civil service aircraft mechanic upgraded to a supervising job, a youthful captain struggling with his first squadron command, or a forty-yearold colonel losing hair and peace of mind trying to reach combat effectiveness in a fighter-bomber group manned by green pilots and crew chiefs two years out of high school. If any of

(Continued on page 146)



THE PRICELESS INGREDIENT

At Hayes Aircraft there is an invisible force, with neither shape nor form. Yet this intangible element has set Hayes apart in a field of its own and is a prime reason for the Company's growth. This priceless ingredient is the personal *integrity* of Hayes craftsmen — the engineer with his problems of design, the procurement personnel who obtain raw materials, the scientist in his laboratory, the machinist, the electrician, the test pilot, the sheet metal worker, the detail craftsmen — each taking pride in his individual contribution to the overall operation.

Working together as a group the result is:

- · Quality control of materials and workmanship.
- · Delivery schedules consistently fulfilled.
- · Costs that are competitive.

Thus, this priceless ingredient of *integrity* is largely responsible for placing Hayes Aircraft, in five short years, at the forefront of aircraft modification and overhaul.



POSITIONS OPEN FOR ENGINEERS

With nearly 6,000 employees, Hayes is now a competitive industrial facility for modification and maintenance of aircraft — including largest size planes.

Opportunities open for experienced design engineers, graduate and undergraduate engineering students. Write Personnel Department.

those people get in a jam like Joe did, their superiors have a management problem right now.

At George Washington they don't expect the five twenty-man seminars to come up with five identical solutions to a case study. While principles of sound management are pretty well tabulated these days, you have to stay loose applying them. What works in one case may not in another. What works for one manager might not appeal to the next one. As Professor Joe L. Jessup, Assistant Dean of George Washington's School of Government and coordinator of the Air Force Resources Management Program, says: "There aren't any single 'right' answers in the back of the management book. When the Air Force asked us companies like General Electric, Detroit Edison, US Rubber, and by contrast, those of organized American labor as expressed by AFL-CIO spokesmen. Professors from Massachusetts Institute of Technology, Columbia, Texas, and George Washington talk about such things as communications in human relations, psychology in management, special categories of America's manpower, our situation in natural resources, and how managers can teach themselves to think better.

They aren't cut-and-dried, stuffy academic talks either. The businessmen are straightforward and realistic; the CIO doesn't care whose toes it steps on; and the professors, all specialists in the new educational field of management that American indusacross town—spend their evenings in neighborhood pubs continuing the lively bull-sessions that started in class that day. In the easy, scholastic atmosphere they put aside routine worries, and only the dismaying youthfulness of the pretty George Washington coeds in the Student Union reminds them how long ago their own college days really were.

The classroom sessions revolve about some pretty interesting propositions—interesting not only to professional officers, but also to any thinking citizen of mid-Twentieth Century America. Things about people, for instance.

A revolution has taken place in our labor market since World War II. All of a sudden there just aren't enough Americans. Part of this is because the unprecedented peacetime strength of our armed forces swallowed up 3,000,-000 of our regular labor force. Some of it is because children go to school more years these days and aren't available as workers so soon. A lot of it is our booming economy which keeps unemployment at a record low. One significant shortage is the couple of million young adults who didn't get born in the insecure years of the depression.

The present bumper baby crop that started with World War II will eventually make up the depression loss, but we're going to feel that bob-tailed generation for another decade. Right now the nation's population is growing at the rate of five a minute, but except for a trickle of immigrants this won't add to the labor force for years.

What's our manpower situation in case of war?

Sixty-two or three million Americans support themselves and everybody else. The other hundred millionplus free loaders include the military, three million unemployed, four million students, thirty-seven million housewives, and about fifty-three million children, old people, and those in hospitals and prisons. A national emergency would bite into the sixty million-odd labor force. In World War II twelve million of them went into uniform, including a good many students, of course, and four and a half million housewives entered defense plants in their stead.

The way it stands now America's thirty-seven million housewives, many with small children to care for, constitute our only untapped labor pool of any size. Engineers estimate that women could be trained to do eighty percent of the jobs in essential wartime industry. Nobody is making any

(Continued on page 149)







The officer students at George Washington listen to—and argue with—such men as these three—left to right: J. Q. duPont of the E. I. duPont de Nemours & Co.; H. H. Bookbinder of the AFL-CIO; and Maj. Gen. Lewis B. Hershey.

to set up this three-week course for commanders back in '51, we selected 'school solutions' for our case studies and insisted that the students reach the same ones. One seminar came up with a management technique to solve a problem which we thought was simply awful, and told them so. Six months later one of the biggest mail order houses in the country adopted the same technique and saved a million dollars! Since then we've figured there can't be anything very wrong with a solution twenty experienced Air Force administrators agree on."

It costs the Air Force a lot of money to support this Resources Management program. They've already sent more than 3,000 officers to it, and classes are scheduled well into the future. It's paying its way though. Graduates not only do their own jobs better, but go back to duty as apostles of improved management who spread the word.

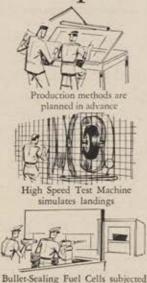
These officer students do a good deal more at George Washington than just thrash out canned management problems. They listen to—and argue with—the ideas of top executives from try demanded, have long since climbed down from any ivory towers they might once have inhabited. To the officer students no speaker or his topic is sacred, and they question, dispute, and challenge freely. The whole idea at George Washington is to stimulate thinking and swap information.

The program is kept deliberately informal and unmilitary. Wearing uniforms is tacitly discouraged, and by the second or third day of classes it's hard to tell a junior lieutenant colonel from a brigadier general, at least by his dress. In sports coats and slacks they all look like slightly aged college students.

For most of these officers, average age forty, this is the first exposure to campus life since undergraduate days. George Washington is a big city university and the campus is mostly pavement, but the collegiate flavor is still there. The Air Force students room together in nearby tourist hotels, get cut-rate student tickets to shows and athletic events, and—since most of them are far from home and the officers' club at Bolling AFB is clear



From the drawing board to the finished product, nothing is left to chance at ...



to tests on gun-fire range

Our airmen's lives depend on the manufacturing skill that goes into their planes. New ideas and revolutionary improvements are a must-but that's not enough-Firestone feels it's just as important to guard the uniformity and high quality of the products we're making today. To guarantee uniformity and be certain that the highest standards are maintained, skilled Firestone Quality Control engineers check every step in the manufacturing process. It's no coincidence that Firestone

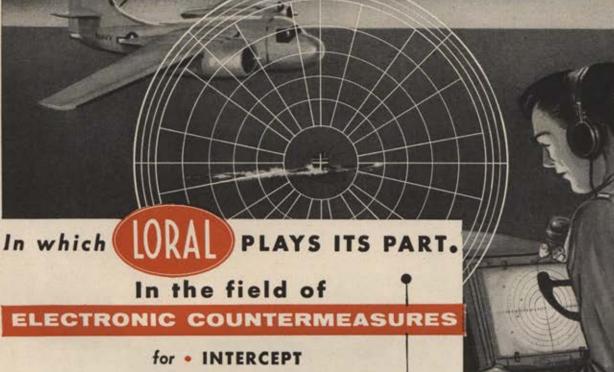
products give our airmen greater safety-it's

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The LORAL AIRBORNE NAVIGATIONAL COMPUTER. A compact and occurate system that computes and indicates ground displacement of aircraft.



The LORAL Automatic Short Range GROUND POSITION INDICATOR—an 18 lb. navigational computer automatically indicating ground position.



The LORAL GROUND TRACT PLOTTER that provides an instantaneous and permanent record of the ground track of the aircraft.

Dept. AF-8

LORAL ELECTRONICS CORPORATION

NEW YORK 54, NEW YORK

MANAGEMENT_____CONTINUED

predictions, but if the nation had to mobilize there is only one place for the new workers to come from.

Since it's our scarcest commodity, manpower is the military manager's primary concern. It is true that certain other short-supply resources make trouble for military planners, but stockpiling, technological advances, and the continuing discovery of new resources are reducing the problem of "things." The manager's big job is how to do more with fewer people.

To the Air Force, which has to man 137 wings by mid-1957 with only a handful more members than it had for 120 wings, this is a problem of nightmarish dimensions. What can we do about it?

One thing is to hire cheap labor for menial tasks and keep high-priced airmen on the jobs they were trained for full-time. An airman costs too many thousands of dollars to use him on a mop handle or a potato peeler. Two mammoth employment projects — "Operation Homefront" in the States and "Operation Native Son" overseas — are doing this. While the airman's dream of a hired man to pull his KP in basic training is still a dream, it may even-come to that.

Another is to weed out incompetents fast. Eliminating misfits has always been a laborious and expensive process in the military, but streamlined procedures are coming into use.

You can always work people longer, but after a while productivity falls off, morale goes down, and accidents rise. The civilian industries that went to fifty- and fifty-five-hour weeks in the war found it a losing proposition.

Finally, and this is where the manager comes in, you can make jobs easier and more interesting. You can stimulate in your people a desire to produce more. You find new tools and better techniques. You use automation everywhere you can. On some Air Force bases supply accounting is already being done by machines. You increase the prestige of people, you



From left: Joe L. Jessup, coordinator of the AF Manpower Management Training Program; Gen. Thomas D. White, AF Vice Chief of Staff; Oswald S. Colclough.

augment their "psychic incomes," which is management jargon for the sum total of satisfactions a man gets from his job. You do all these and more—if you're a manager.

Who is this rare bird, this manager? Industry began kicking definitions around after the war when they found they had suddenly run out of managers. They finally decided that a manager was a breed apart, characterized by a willingness to assume responsibility for the work of others, which is a trait found in fewer than ten men out of fifty.

How else can you identify him, they asked, and got the statisticians in the act who correlated what data was available and came up with:

A successful manager is apt to be taller, heavier, have a higher IQ, and more children than the average man, was probably born in February or March, and dies early.

That wasn't much help. They looked harder and found:

A successful manager speaks and writes so that people understand him. He reads selectively, asks intelligent questions, conducts successful interviews, knows how to use elementary statistics, consults authority, and understands human relationships. He works on a personal priority calendar and assigns intermediate deadlines to subordinates so that final deadlines are met.

Well, this was fine. The only trouble was that a man who could do all that was already somebody else's execu-



Prof. Joe L. Jessup, coordinator of the management program, is professor of Business Administration and Assistant Dean of the School of Government,

tive. They needed to know how to spot the potential manager.

They discovered that most managers begin as some sort of specialist, identify themselves with an organization quickly, believe in it, sell its policies to their subordinates enthusiastically, and are chronically greedy for more responsibility. That may be why so many of them are also subject to headaches, insomnia, eyestrain, obesity, and high blood pressure. Indeed, well adjusted, happy, "normal" people are frequently poor managers.

people are frequently poor managers.

One large chemical company which lost a fearful number of junior executives in the Texas City disaster replaced them with men who had at least two of these three characteristics:

They got along well with people. They had had a wide variety of experiences. Though often lazy themselves, they could inspire great drive in subordinates.

The formula seemed to work.

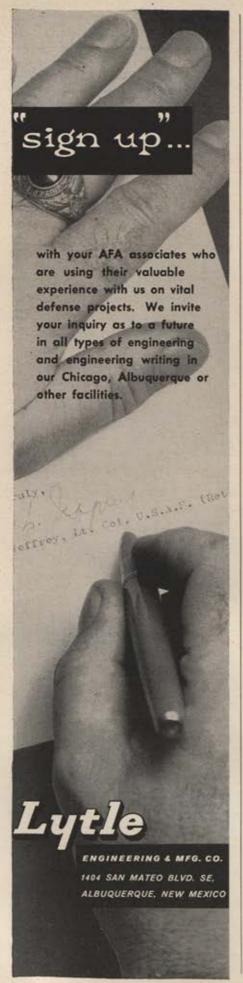
The Air Force, of course, takes the position that all its officers and non-commissioned officers are managers and if they aren't, they'd damn well better get to be. To help them, management schools have been established at Air Force bases everywhere. Se-

(Continued on following page)

ABOUT THE AUTHOR



In March we published "Never Underestimate Your Crew Chief," a fiction feature by Colonel Kay. It was later adapted to TV and appeared on the Schlitz "Playhouse of Stars" under the title "The Mechanical Cook." Just one more feather in the cap of the author who has won the TAC Short Story Contest three times and the AF-wide contest once. He has also sold articles to Country Gentleman, Sports Illustrated, Argosy, and Adventure. He served in China and India in World War II.



lected junior officers, and non-coms attend a seven-weeks' manpower and management engineering course at Scott AFB, Ill., and go into the field as special advisors to commanders. Management newsletters circulate among commands, and if somebody in Alaska or Alabama finds a better way to inventory commissary stocks or change a jet engine, the word is flashed to everybody. Every unit from squadrons up reports management improvements quarterly and whopping cash awards are given to civilian employees who think them up. Public law denies such payments to the military, but they get recognition and commendations. Every officer's effectiveness rating, on which promotion and careers depend, has to include a statement on how he practices economy and management.

The Air Force isn't kidding about this subject.

At George Washington they spend a lot of time on the simple question of communications between people. Unfortunately it just isn't simple. Faulty communications can louse up the best organized shop, office, or wing headquarters.

The trouble is that people are emotional and won't accept language on its face value. It goes like this. The boss sweeps in with a cheery "Good morning!" and all the clerks mutter "What do you suppose he meant by that?"

Instead of listening people try to interpret. They think: "What did he mean by that? What did he really mean? What does it mean to me?" And they spend the morning worrying so much that nothing gets done in the office.

What a manager has to realize and adapt himself to is that everything he says to his subordinates is charged with portent. Everything he does, or doesn't do, even the way he looks. Was he gruffer than usual? What was that funny look in his eye anyway? Do you suppose . . . ?

This sort of thing makes it easy for a harassed manager to jump to the conclusion that, as a facetious catchphrase used at George Washington puts it, "People are no damn good." But that attitude won't solve anything, only compounds the problems, and isn't true in the first place. People are all right. You just have to understand them.

Writing causes almost as much trouble as talking. While not loaded with emotion to the degree that speech is, far too much of it confuses its readers instead of informing them. When a writer forgets whom he's writing to, or is simply too lazy to write clearly, time is wasted and costly mistakes occur.

Industry has learned this and is spending a lot of money teaching its executives how to write what they mean—no more, no less, and shut up! The Air Force, encumbered with a heritage of stiff military diction, realizes its special guilt in this area and is doing something about it. Pamphlets on readable writing are circulated, and every school an officer attends includes a course on the subject. They're even rewriting Air Force regulations these days so that orderly room clerks can understand them!

The classic military letter, obscured by jargon and expressed in the formal third person, is going out the window. Now a commander can simply endorse a letter with "I agree," and let it go. Not long ago he'd have had to write something like, "The undersigned concurs with the recommendations and findings contained in the basic correspondence, etc.," or his endorsement would have bounced like a tennis ball.

Just as the "public be damned" attitude of certain monopolies and trusts of the Nineteenth Century have given way to modern American industry's eagerness for public understanding of their role in our national way of life, so has the Air Force moved away from traditional military aloofness from civilian affairs. Good community-airbase relationships are good business, good management, and good sense. Officers and airmen participate in community activities. Civic organizations tour Air Force bases to see where their tax dollars are going and to better appreciate the development of modern airpower.

Keeping young airmen out of dives by providing desirable entertainment and social activities in local communities is good for America, for the Air Force, and for the hundreds of towns and cities which are neighbors of Air Force bases. Court martials and disease are reduced, fewer police are needed, and the community discovers that instead of a rascally pack of nuisances these airmen are valuable temporary citizens and very often turn out to make highly suitable sonsin-law!

It's America's Air Force anyway, manned by her best youth and paid for with her money. The need for Air Force officers to work with local business and civic leaders on noise abatement programs, air traffic control, reduction of highway accidents, and the like comes in for plenty of discussion

(Continued on page 155)



- new air traffic safety by Stewart-Warner Electronics

Now, the new Stewart-Warner Electronics Airborne Safety Beacon makes it possible for every plane in the air to carry identification as positive as your own fingerprints. Stewart-Warner Electronics, the pioneer and builder of the first airborne safety beacons, which were tested by the Air Navigation Development Board and CAA, now offers airline and other aircraft owners automatic identification for greater air traffic safety.

The new beacon combines all the reliability and long-life factors of airborne military equipment supplied by Stewart-Warner Electronics to the services since 1942. This rugged equipment incorporates ARINC tubes and is designed to meet specifically characteristics No. 532-A.

CAA is now planning to install interrogators on ASR radar at all major air terminals to improve air safety. Be sure you take advantage of this program by installing an S-W Electronics Air Safety Beacon. Write today for full details from our Civil Aviation Department 11. Stewart-Warner Electronics, 1300 North Kostner Avenue, Chicago 51, Illinois.



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IT TAKES A BIG NEST TO HATCH A 62-TON BIRD!

Nestled in the foothills of the Appalachian Mountains, at Marietta, Ga., is a modern industrial wonder—the largest integrated aircraft plant under one roof in the world. It is Government Aircraft Plant No. 6, operated by Lockheed for the U.S. Air Force.

Ordinarily even a very large plant would have its hands full producing a plane as advanced as Lockheed's new 62-ton C-130 Hercules combat transport. Yet so large and efficient is GAP-6 that the Hercules assignment is but one of three major tasks handled simultaneously!



Side by side, new Lockheed C-130 Hercules planes (right) and Boeing-designed B-47 Stratojet bombers move along assembly lines

at GAP-6. B-47s shown are earlier models being modernized by the extensive Mod-IRAN program (Modification-plus Inspect and



Parallel lines of B-47s stream toward military service at GAP-6. At left: new Lockheed-produced planes. Right: Mod-IRAN line

(seen in reverse in top picture). Lockheed's 19,000 skilled workers keep both vital lines flowing smoothly. At the same time, they turn



QUICK FACTS ABOUT THIS GEORGIA INDUSTRIAL GIANT

The main factory building contains 3,265,000 square feet of production floor space. (Another 1,035,000 square feet in other buildings give GAP-6 almost 100 acres of production space under roof.)

3,361,500 square feet of paved area *outside* the plant provide another 76 acres of space for final work.

Final assembly bay has a 300-foot clear span, 45 feet high for its entire 2,045-foot length.

26 radio-controlled cranes, operating on 39 miles of overhead track, speed materials to any part of the plant in a matter of minutes. 50,000 different parts are fabricated in GAP-6, then rushed into production with clockwork precision.

Subcontracts and orders for parts and other materials have been issued to 7,800 individual contractors – 77% of whom are in the "small business" classification.

LOOK TO

LOCKHEED

GOVERNMENT AIRCRAFT PLANT NO. 6 LOCKHEED AIRCRAFT CORPORATION GEORGIA DIVISION, MARIETTA, GA.

FOR LEADERSHIP



Repair as Necessary). This program includes over 200 modifications and requires major fabrication, assembly and flight-test facilities.

It increases performance, range, combat capabilities and maintainability of older B-47s, making our defense money go further.



out the "New Strong Man of the USAF"-the Lockheed C-130 Hercules. This remarkable new propjet plane flies farther, faster

and at less cost than any other combat transport, Below: C-130s await flight tests before assignment to Air Force Commands.





Realistic targets for today's advanced weapons systems must be as fleet and maneuverable as the potential opponents they simulate. Small, speedy, remotely controlled drones can give pilots and gunnery crews the combat training they require.

Powerplants to propel drones at transonic and supersonic speeds represent another important area for the application of the advanced technology resulting from RMI POWER ENGINEERING.

Rocket power to drive missiles and piloted aircraft higher and faster has been the prime product of RMI since its inception 15 years ago. Today, as the oldest company in the rocket engine field, Reaction Motors has a wealth of experience gained in the design and production of engines for record-holding vehicles of both types.

Engineers and Scientists: creative and rewarding opportunities exist for all types of technical specialists in the research, development and production of rocket power devices. Send complete resume and salary requirements to employment manager.

PRIMARY AND AUXILIARY ROCKET POWER FOR: Missile Boosters and Sustainers, Aircraft,
Target Drones, Ordnance Rockets, Ejection Systems, Launching Devices.

Power | for Progress

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MANAGEMENT_____CONTINUED

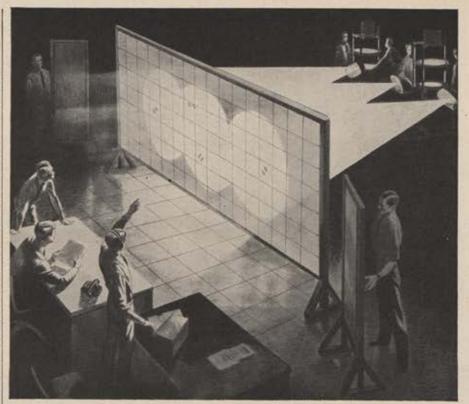
at George Washington University. In its drive to improve management, the Air Force welcomes help from any quarter. Since American business and industry pioneered the infant "science" of management, financing research in it at universities, and soliciting books and articles from experts on the subject, the course at George Washington is largely what the businessman has enabled it to be. They use McKesson and Robbins's management development program. They study McCormick and Company's experiments in multiple management, which sat shipping clerks, salesmen, and machine operators down in conference with the president, and made money as a result. They listen to the troubles of a sock manufacturer and look at executive development training films commissioned by baking firms and the aircraft industry. They all help. Somewhere, somehow, anything that works well for modern American business will work well in the Air Force.

Like the businessman, and for a far more sobering reason than the mere risk of going bankrupt, the Air Force knows it has to get the most out of its people, dollars, and facilities. It knows that dollars are tight and will stay tight if the national economy is to survive. It knows that people are its most precious asset, and it also realizes that failure to use them properly is unforgiveable and could be disastrous.

That's why they send their officers to George Washington. In addition to being tacticians, logisticians, or technical specialists, these officers have to be managers.

Actually they already are. As Dean Jessup will tell you, "The officers we get are already pretty good managers. They have to be to have gotten where they are. What we do is clarify the management ideas they already have, give them better understanding of the whole management problem and a stimulating atmosphere in which to see what they've already done as managers and how they can do it better from now on."

The average student in the hundredman class has been managing people and things for close to fifteen years. Said one lecturer-executive of a large corporation after a hammer-and-tongs question-and-answer session, "Why, there's fifteen hundred years of management experience in that room! Most of those fellows could hold down forty thousand dollar a year jobs in industry." He paused. "Thank God we've got them in our Air Force."— End



NOW IT'S "WIDE-SCREEN" RADAR...

and here's how Craig helps put the show on the road!

The new Northrop Sky Screen* speeds up radar operations and cuts down the possibility of error by giving the whole command group a "widescreen" view of the display the moment it appears on the operator's scope. While operators plot the track with markers, the group can follow the projected image on the screen and make decisions without a moment's lost time.

If the command group were to shift its operations, Northrop's Sky Screen would move right along with it — traveling first class in lightweight, superrugged transit cases designed and built by CRAIG. For like many of the nation's electronics manufacturers, Northrop knows CRAIG designed and built cases must pass severe tests for environmental and service conditions... and can deliver equipment that's large or small, rugged or delicate... with complete safety.

For full information, write CRAIG today.

*A Product of Northrop Anaheim



Cases for Northrop Sky Screen-by Craig









55" X 35" X 37"

136" X 26" X 19"

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56" X 28" X 29"

How to Use Airpower



Our planes can deliver H-bombs-but in the minds of men is a nagging question: Can this power be used morally?

MORALLY

By Chaplain (Lt. Col.) Warren E. Ferguson

THE Honor Guard stood watch by flag-draped caskets. In Chapel One all was quiet. I was about to begin the funeral service for nine crew members of a B-29 tanker that had refueled Lucky Lady II. These crewmen had done their job well, and Lucky Lady II had continued her non-stop flight around the world. But the tanker had crashed.

What could I say to give meaning to this service? Some of America's finest young men had given their lives to provide airpower that translates directly into a language of protection for home and country. What could I say to help the living? What could I say that would give meaning to the immediate and continuing loss?

I began the service. I read passages of Scripture—passages that emphasize man's relation to God, other passages that emphasize God's love for man. I read brief obituary statements that showed the untimely end of nine promising lives.

We prayed.

I talked briefly about the meaning of life and death. I pointed out the contributions these men had made to the safety of the world through the proof, by the successful flight of the Lucky Lady, that we could strike anywhere. These men had sacrificed themselves to help demonstrate a power capability that has a continuing impact for peace by deterring enemy aggression.

I challenged the living to make their lives a memorial to the dead by helping make the Air Force our most effec-

tive force for freedom.

We prayed and moved from the chapel to render mili-

tary honors.

In the world where these young men lived, the capability proven by the Lucky Lady has increased greatly and still grows. Our planes can deliver atomic and hydrogen bombs anywhere. But in the minds of all men is a nagging question: Can this sort of power be used morally? Can I conscientiously participate in the use of the tremendous power of modern weapons?

Pretend that you are a crewman on a flight to drop an A-bomb on an enemy target. What would your heart be saying? What would your mind be replying? Would you be so convinced of the moral righteousness of your mission that you would use all your abilities to annihilate your

target?

Men who fight wars have a moral right to know about the morality of their actions. Our flyers need to be sure of their moral right to hit targets with weapons of mass destruction. Because of their high sense of duty they will obey the orders of their government and accomplish such missions. But they share the general apprehension about the use of nuclear weapons.

As an Air Force chaplain, I recognize that part of my obligation to men everywhere is to interpret a standard for moral application of power. If I cannot help Air Force people know what is right, and if I cannot explain the moral necessity for the development and use of airpower—I should not be in uniform.

The American heritage, based on faith in God, has transmitted to us a strong desire to block injustice and tyranny regardless of its location. We want to protect the weak, whether men or nations. Our desire for a world-wide climate of freedom has a two-fold basis: humanitarian consideration for people and enlightened self-interest. All people are now so interrelated that the affairs of each nation are of global importance. Citizens of the United States should accept the fact that our government must take the lead in blocking international unrighteousness.

Communism as a powerful and spreading ideology presents a deadly threat to freedom-loving people. We cannot afford to ignore its clearly announced policy: to oppose the democratic ideology at every turn and to destroy our

liberty.

In the face of this threat we must take the initiative in the application of pressure. There are many kinds of pressure; from these we must choose the types that will work best.

Americans believe in resolving problems through reason. We believe that even the most complex problems can be solved when men of good will meet together in sincere negotiation. Arbitration of critical differences appeals to us as being much more sensible than battle. Through the United Nations we seek justice for all.

But diplomacy alone is not always persuasive enough to

harmonize international differences.

The court of world opinion provides an open forum for persuasion through ethical pressure. Here rages the battle for the minds of men. Our information services work endlessly to enlighten the world about our attitudes and purposes. In every way we seek to dramatize the difference between Communism and true welfare. But communication between nations is difficult and is more so now because

(Continued on following page)



B-52 Stratofort. Airpower must apply its full range of capabilities as necessary to provide a climate of freedom.

many nations are under the domination of unethical pressures which prevent outside information from reaching their people.

Religion is a great medium for the application of moral pressure. Followers of the great religions believe that their faith provides the answer to world needs. Certainly I believe the answer is inherent in my religion, and I preach with the conviction that it does provide the answer. The different religions provide a common denominator for moral decision and a means for settling differences within their own spheres. However, each major religion is limited in its effect on the followers of other faiths. Under present circumstances the religions of the world are not sufficiently united in spirit to insure harmony or persuade all nations to conform to moral standards.

Harmony on the strength of moral principle is not possible when the conflict of ideologies involves nations that substitute their own desires for moral standards.

These opponents of freedom respect power. Since they defer to strength while flouting moral suasion, we must use power to attain our objectives in international relations. A potential for great power will not meet this need; living, active force, ready for use, is essential to meet current dangers. But we must apply this power in harmony with high moral principle or we will destroy the climate we seek by the methods we use.

Our requirement that all actions be compatible with high moral principle poses a fundamental question: In the application of power to attain legitimate goals, what methods are morally acceptable?

Precedent has usually guided our moral decisions and is the basis of our current attitudes. We resist new developments and methods. But this resistance is not morally valid, for past actions may have been wrong and new methods may offer much finer possibilities for right. However, we continue to choose our moral standards on the basis of their harmony with past deeds and methods, rather than their harmony with moral reality and principle. We are tied to old ideas and concepts.

Any idea of the morality of force should be examined carefully and fairly. But some of the currently accepted ideas are based on misconceptions.

The often-used quotation that "power corrupts, and absolute power corrupts absolutely" is based on the premise that power is evil and contaminating.

I have discussed my work as a chaplain with some people who could not reconcile my position as a clergy-man with my position as a part of the military service. They considered the very existence of this military strength immoral. The same idea of the immorality of power was part of the controversy concerning development of the hydrogen bomb. Some of those who opposed the H-bomb project felt that it was morally wrong to bring such power into existence. The fallacy of this idea lies in crediting power with moral quality, instead of recognizing that power is neither good nor evil except as people use it.

Some believe a large military force is incompatible with freedom. Such thinking is not supported by American experience. In 1784 the Continental Congress abolished the Army; they felt standing armies were inconsistent with a free society. But experience soon proved that freedom required protection; so they established a force to meet the needs of the time. Under the Constitution, our government must still provide adequate military strength.

Involuntary service by citizens is sometimes necessary to meet current needs for military protection, but many people object to peacetime conscription. However, these objections hinge on the meaning of the word peacetime. Many who object define peace as the absence of a shooting war. But the present is not a time of peace-shooting war or no shooting war.

Contrary to popular fictional treatment, men who are prepared, ready, and willing to fight are not spoiling for battle. As a chaplain in combat or training, I have not found our men anxious to die. Some fear that the decision to fight when necessary may be delayed too long to permit victory. But their lives are at stake in war. When members of our military force express a desire to fight, they simply

(Continued on page 161)

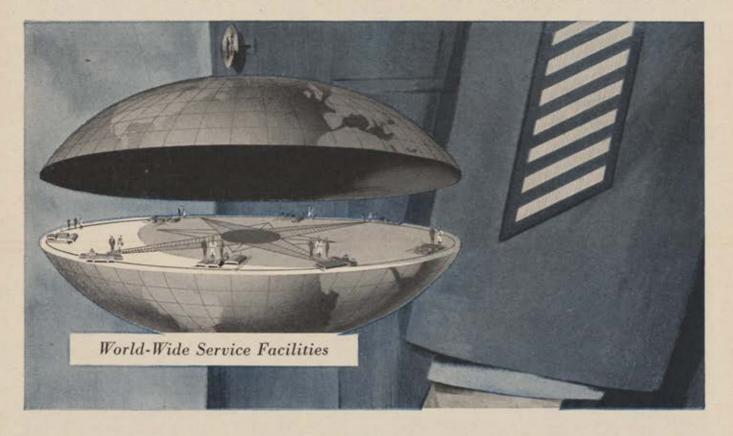
ABOUT THE AUTHOR



Chaplain (Lt. Col.) Warren E. Ferguson was born in Eupora, Miss., on Oct. 18, 1914. He is a graduate of Mississippi College (BA, '36) and received a Master of Theology degree from Southern Baptist Theological

Seminary in Kentucky ('39). After serving as a pastor in Tupelo, Miss., he entered the service in 1942. He was wounded in France in 1944 and was hospitalized until 1947. A graduate of the Air Command and Staff School ('55), he is now assigned as the Staff Chaplain at headquarters of the Central Air Materiel Area, Europe.

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want to take the initiative in preserving freedom. Whether this course would or would not be the best means of protecting our freedom, I know this attitude is an expression of dedication to their country—not of longing to prove themselves.

In spite of popular belief, it is not a military short-coming to want to strike with a strong physical force without first exhausting every other reasonable means of resolving problems. Military people do not believe that a fight is always the best way to solve differences. But they do believe that adequate power available to leaders gives them confidence and calmness. Rather than tempting them to hasty actions, it permits them the discretion to delay action or to act immediately. Thus they can employ our peaceful capabilities to the maximum degree of effectiveness.

Might does not make right. But it can destroy right. Or it can protect right.

Power is neither good nor bad. It can be used in either moral or immoral ways, but inherently it is neither of these.

The morality of power is determined by its application. Power itself is amoral. Man in control of power is moral or immoral. What he does with it is far more important than what the power is. For example, a pocket knife used to kill is just as lethal within its scope of application as an atomic bomb. The kind or amount of power does not alter the relationship between power and the man who uses it.

Just as bullying with force is immoral, it is equally immoral to cause people to believe we will not fight even to survive when we fully intend to fight if forced to. We must make this policy clear to our friends and enemies alike. And we must make our applications of power support our policy. To fail to do so might cause an ambitious enemy to begin a war under the false assumption that we would not fight.

Military power can be applied in many ways and for various purposes. These purposes can be grouped rather loosely into three big categories.

. To Survive. Men will fight to survive. Their instinct for self-preservation compels them to defend themselves. Americans feel morally obligated to apply power as needed to survive. Right or wrong, the United States will fight for survival.

Use of military power for survival only is moral except

that it can delay action to the point where it will:

1. Threaten the very existence of our nation by giving us only two options: fight or be enslaved. The option to fight at that time would be taken, but the victory might not be possible and slavery might be the final result.

2. Cause the sacrifice of countries whose survival depends on our assistance in their fight against enslavement.

Leave freedom-loving people under the domination of Communist masters.

To Preserve the Status Quo. Things won't stay as they are, for the world is changing and dynamic. Progress is necessary, just as change is inevitable. Expansion of Communism will not be stopped unless changes for good occur in areas where Communism seeks dominance. Most attempts to use military power to keep things static are doomed to failure, because we could not preserve the status quo even if we wished to do so.

Passive containment is wrong. It causes us to react to other pressures rather than take the initiative ourselves and use our pressures for moral purposes.

Opposition to change will not solve world tension. Failure to act to make the inevitable changes produce good might make a fight for survival inescapable.

Delay of such action will not create nor maintain nor restore a climate of freedom.

To Maintain or Create a Climate of Freedom. We are morally bound to do what we can to preserve freedom and to create a climate in which freedom can prosper.

In this bold outlook we have a clear-cut goal: survival without war. This goal cannot be reached through military power alone. All elements of power should be used: education, politics, economics, world opinion, technological cooperation, religious, and missionary influence—but military power must be applied as necessary to insure the freedom of action essential to their effective operation.

Privileges we take for granted are ours only because the government protects them. Legislation and law enforcement are our basic means of insuring this climate of freedom. However, these functions require that the integrity of our country be preserved. Throughout our history a military force, sufficient to protect our government in its normal functions, has been necessary. In the past a small standing force backed by a population willing to fight has met this requirement.

(Continued on following page)



B-47 Stratojets. Airpower must be a living reality-it must be ready and flexible enough to meet any challenge,

We do not have exclusive rights to freedom. In fact, the United States, as a leader in world affairs, is obligated to help other nations attain or maintain a climate of freedom favorable to moral progress. This help cannot be supplied by government alone. The full range of cooperation is needed. Educational, commercial, cultural, and church programs can make tremendous contributions toward achievement of the world-wide climate of freedom. But military power is essential as the protector of all types of international cooperation.

To maintain or create a climate of freedom inside the United States and beyond our borders, we must use all military forces. But among these forces airpower is dominant; it is absolutely essential to victory in war. And its capability of striking any target in the world with any weapon from an idea to an H-bomb makes it the only power flexible enough to apply appropriate force in all situations. In current world situations we should apply airpower in line with the following priorities:

• Priority 1: To Restrain Aggressors. Fear of superior power is the only block to the ambitions of the Communists. To be effective today, power must be active, living, ready to strike anywhere with the most advantageous type of weapons. The very existence of kinetic airpower, backed by the will to use it as necessary, is deterrence at its best.

Elements of this capability must at times be guarded by strictest security measures in order for us to maintain technical superiority and keep our enemies afraid of our capabilities that are unknown to them.

• Priority 2: Positive Action Short of War. Under the shield of the force existing to restrain the enemy, airpower

can be used to give us the initiative in developing a climate of freedom in areas that might otherwise be enslaved. Communists move carefully when their actions might bring war with a prepared foe. But their desire for expansion does not stop.

We should take the initiative. Deployment of sufficient force to all danger spots is not possible. But we can deploy some air strength to support critical areas. We can help vulnerable countries build their power to resist. We can show force in their behalf. We can rotate elements of strength to assure our friends that we will back them if they will not yield to enemy pressures. We can provide airpower to guarantee that violation of the integrity of sovereign nations will not be permitted. We can apply airpower most effectively when we use it to protect people striving for freedom.

 Priority 3: Application in War. Here as in the preferred priorities we apply power according to the need.

If the war is of the local or brushfire type, the countries involved can be dealt with in a limited war. However, we are morally bound to refuse any limits that will deny victory with a minimum sacrifice of American lives. We must never let limited war cause us to sacrifice lives needlessly. Rather than let the enemy draw unacceptable limits, we must use airpower, equipped with the most advantageous weapons, to strike those targets that would prove most costly to him.

If general war comes in spite of our restraint and our efforts to avoid it, we would be morally required to win as easily, as quickly, as decisively as possible. The only way to win such a war is to inflict staggering blows on the enemy's power to wage war. If we fail to do this in the swiftest and most thorough manner, we would invite the destruction of morally responsible civilization. Airpower with its full arsenal of weapons is the only means of applying this total war punishment.

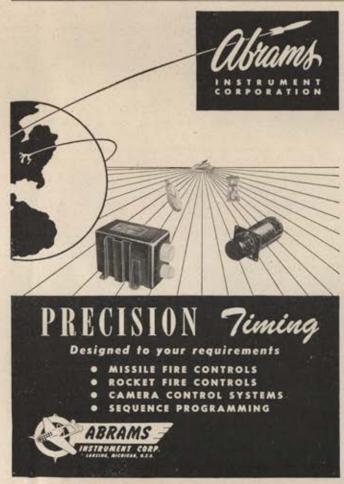
War is grim. New weapons have made it more terrible than ever, and no one is certain what another war will bring.

The whole of total nuclear warfare is utterly devastating. However, if war is required, I believe that our most humane course would be to aim a stunning blow at the most appropriate enemy targets even though the toll in lives might be great.

Full application of airpower with its best weapons is less brutal than alternative ways of fighting modern wars because it is decisive, sure, and swift. Prolonged torture is immoral when swift victory is possible.

What, then, shall I tell aircrews?

- 1. Our airpower is essential to insure a morally oriented world; therefore, an adequate moral code demands that our:
 - · Airpower must be second to none.
- Airpower must respond to the will and need of the country.
 - Airpower must support action for peace.
- Airpower must strike to destroy targets as quickly and effectively as possible if there should be a war.
- Airpower must be a living reality, ready and flexible to meet any challenge.
- Airpower must apply its full range of capabilities as necessary to provide a climate of freedom in all the world.
- 2. Moral principles endure. As they apply to our country in the use of airpower, they apply to us as individuals. Therefore, we as individuals must live righteous personal lives:
 - · In relation to our fellow men.
 - In obedience to God.-END





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BLACK



Weather alert! It meant

Al Banning's B-52 wing

had to evacuate the base

-pronto! An AIR FORCE

Magazine fiction feature



By Grover Heiman

S HE awoke, Dorie pulled her knees up and murmured sleepily. The telephone jarred him again. He sat up and the fatigue returned. The luminous clock showed three past four as he said thickly, "Colonel Ban-

This is Captain LaParte, sir, in the control room. Headquarters has just called a weather alert. That cold front is moving very fast. Frontal passage is predicted for oh seven hundred."

Al Banning suddenly felt his thirtysix years. A weather alert meant a "black area," a spawning ground for twisters. A weather evacuation meant recalling everyone to duty. Did he have to fight nature, too?

He glanced at his wife. She was sitting up in the bed. Still the prettiest wife on Sheraton Air Force Base, he thought, and they hadn't had much time together lately.

A stream of curses began deep inside. His B-52 wing had flown an operational readiness mission yesterday and the Air Force inspectors had said they were ready. Ready, sure, but tired, too. During the past four months he had driven them mercilessly, day and night. Banning cleared his throat and told LaParte to begin recalling all personnel and to send his car.

Dorie had that stubborn Irish look in her eyes. She tossed her blonde head defiantly, "Not at four a.m."

"Weather stinks. I may have to evacuate the aircraft,"

"Do you have to call everyone out?" "Remember Lakewell? A tornado nearly ruined a bomb wing there-on the ground. That won't happen to us."

Four hours of sleep weren't enough. His mind was as taut as his muscles. He couldn't think, didn't want to

"You're killing yourself, Al," Dorie said, slipping into a robe. "Don't try to do it all yourself."

"It's my job," he said, heading for the bathroom. The kids were asleep. He looked in and smiled at the two small forms. "I warned you not to marry an Air Force man," he said.

"I should have listened."

"I don't blame you," he said. "I

don't blame you a bit.'

"Al," she said, touching his arm. "You don't even have time for Timmy and Sue any more. Honey, you've even forgotten how to smile. Is this job worth it?"

"Look, Dorie," he said, squeezing his eyes to shut out the irritation, "I'm a wing commander. At least five years ahead of my time. This is our opportunity!"

"Your opportunity, Al, but I'm not sure about us. Since that first B-52 got here, you've done nothing but live and breathe airplanes. You're killing yourself. Eighteen hours a day. I don't think it's worth it."

"What's eating you?"

"What's eating me?" she asked the room. "The kid colonel wants to know what's eating me! Nothing. Nothing at all, except little things. Like Kay George. She's due any minute. Last night she thought it was going to be real soon."

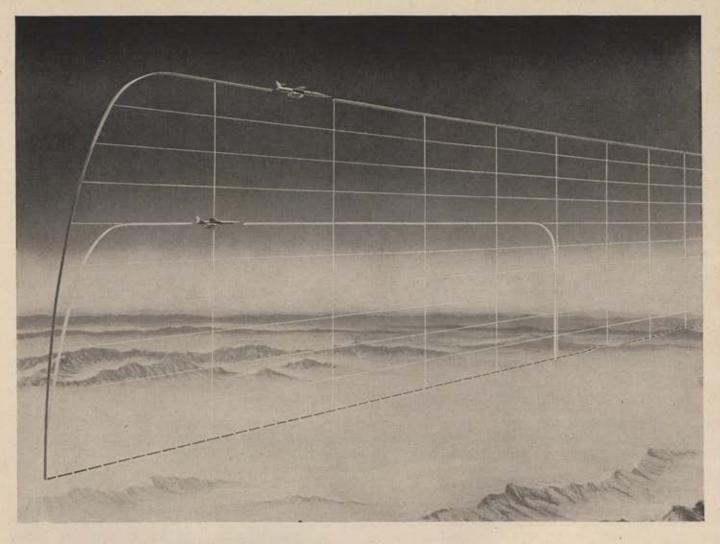
"So what's that got to do with me?" Dorie sat on the edge of the bed. "Al, you weren't like this before

you got into SAC."
"I didn't have thousands of people to worry about either. I'm interested in Kay George's baby, but she's only a small part of this show. I've got to remember the mission."

The mission," she said bitterly. "That's your bible now. Can't you remember these people are human? They can take only so much.'

"Dorie," he said, jamming his hat on his head. "General LeMay gave me a job to do. I'm going to do that job. There are thirty '52s out on that ramp. Millions of dollars worth of aircraft. We can win or we can lose,

(Continued on page 169)



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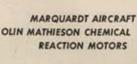
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depending on how we handle 'em."
"Yes, Al."

"Yes, Al," he grunted. "So my people are tired. I'm sorry, but I've got a deadline to get this outfit ready. I intend to meet it."

"At any cost?"

"You're tired, baby," he said and kissed her cold lips. "I'll call you from the office. You go back to bed."

"Honey, please slow down. I'm worried about you."

"I'm all right," he insisted.

"You can't do it all yourself, Al."

The staff car was waiting outside in the sullen Kansas air. He spoke briefly to Connors, the young driver, and slid into the back seat.

In the smoky control room at the base, Banning spotted Lieutenant George, his young face tight and gray in the harsh light.

"George," he said, as he dropped his hat on the counter. The lieutenant walked toward him.

"Yes, sir."

"How's your wife?"

Pete George wet his lips, took the cigarette Al offered, and fished in his pocket for a light. "She thinks it'll be any minute, sir."

"When's she due?"

"Next week, but the doctor said it could be any time."

Al grinned. "They always say that. It's not an exact science."

George tried to laugh and choked on the smoke. "She's scared, colonel. And so am I. It's our first one and we don't have any relatives here to help her."

"Sure. How is the recall coming?"
"Like clockwork, sir."

"Good."

The door opened and Al saw his Director of Operations step into the room, pink scalp shining through tousled gray hair, pinched lips bloodless under the fluorescent lights. At first Al hadn't been keen about Jim Arbold as his DO. Jim was older and could have resented it. But things had worked out.

Arbold briefed Al. All personnel had been notified and the squadrons were reporting at near strength. Of the thirty B-52s, twenty-one were flyable at the moment, mechanics were working on the others and Maintenance was optimistic. Within a few hours all but four would be ready if they had to fly them away from the base.

"I want everything flyable," Banning said.

Arbold shrugged. "Three for sure can't go. They need engine changes." "That leaves one." "Number 4903-the one with the fouled-up inboard pod."

"I want it ready to go, too."

"They're trying, Al."

"I don't want to be unreasonable."
"I know that."

"It's just that we have a job to do and we'll do it."

"We only have twenty-six crews available. All of the others are in school."

"Count 4903."

"We'll have to make up a crew."

"Okay, count me—put down George
as co-pilot and dig up a crew."

"Whatever you say, Al. The weather

moving in and trailing it were dust storms. But there wouldn't be any problem in taking off, and Ground Controlled Approach could bring the '52s back down . . . if they had to take-off.

When Harkins left, Al glanced at his watch. It was five o'clock. He finished the coffee and lit another cigarette. He called the control room and told them he would be on the flight line. He motioned to Connors, who was reading a tattered pocket-book. The airman ran ahead to open the door of the blue staff car.

Colonel Banning tried to relax, but

ABOUT THE AUTHOR

Grover Heiman is, during working hours, Major Grover Heiman, Jr., from the Strategic Air Command's Fifteenth Air Force Office of Information at March AFB, Calif. He has worked with another of our authors, Ed Mack Miller, on several yarns for Aff Force. One of these was "Seventy-Two Hours," the story of a downed B-47 in the Canadian wilds, that appeared in our May '55 issue. Another was Miller's account in December '55 of the SAC "World Series." Major

Heiman became a newsman after the war and accepted a Regular commission in 1947. He's a senior navigator for SAC and, before his service this past year in public information, he had been a SAC combat crewman and operations staff officer. In his off-duty hours, he's a free-lance writer of fiction. In 1953 he won the Air Force short story contest. A native of Texas, Major Heiman is married and has four children, and "a dog named Sam who stays up to watch television."

office is sending up a forecaster with the latest sequence and map."

Al looked across at Lieutenant George. The young flyer's eyes were bleak. Al remembered the baby, but his jaw tightened. George had to learn that the job came first. Dorie had Suzie while Al was in England. He had had to sweat it out. George would have to do the same.

"I'll be in my office, Jim," he said to Arbold. "I'll probably go to the flight line in a few minutes. Schedule briefing in an hour,"

"I already have. Is Major Feldon OK as your navigator?"

Feldon was the wing's senior observer, one of SAC's top bombing experts. Headquarters had assigned him specifically to his present job, but Feldon and Al hadn't clicked. Al couldn't explain it. But with the shortage of crews he couldn't outbble

crews he couldn't quibble.

"Feldon is fine," Al said. He walked to his office and rolled the plan around in his mind while he plugged in the electric shaver. The plan was simple: Don't get caught on the ground, whether the threat was a tornado or a Bison with a bomb.

Captain Harkins from the weather office came sleepily in. The weather wasn't good-late spring cold front his mind and muscles wouldn't listen. He felt terribly and suddenly very much alone.

The Stratoforts were silver bats in the early morning light. The sun was still behind the horizon, but it was coming up fast. To the northwest Al could see the edge of the black roll of the cold front. His gray eyes went back to the '52s and he felt a surge of pride, tinged with awe. Each was worth over eight million dollars. Slung under the sweptback wings were the eight Pratt & Whitney J-57s, each a howling package worth ten thousand pounds of thrust. These planes were SAC's pride, and he wanted all of them in the air. There they were safe. He would settle for twenty-seven out of thirty. That was a healthy percent-

Arbold was waiting for him back in the control room, with a summary of the situation. Weather predicted the front would pass the base in less than two hours. It was a granddaddy of cold ones, but as yet nothing unusual had developed. The winds were strong, gusting sometimes to nearly sixty knots. The ILS—Instrument Landing System—was still out of commission, but the GCA unit was avail-

(Continued on following page)

able. Arbold brought this up because there were considerable dust storms behind the front and landings probably would be on instruments.

"Have you set up the briefing?"

"All the crews are waiting in the briefing room."

"What's the aircraft status?"

"Twenty-seven can go. This includes 4903, but Maintenance reports the liaison radio is out."

"We won't need it."

"Maintenance is tying everything down. We should be able to ride it all right."

"Meaning you don't think we should fly out of here?"

"It's just a fast-moving cold front,

Al."
"Remember Lakewell? That isn't

going to happen to my wing."
"I thought I'd just mention it. The crews are tired."

"So am I."

a job to do. I'm trying to do it the best I can. If we fly, he flies. Take care of yourself, baby," he said and hung up.

Jim Arbold had heard and was chewing on his lip. "Al," he said, "let me fly as your co-pilot."

Al shook his head.

"You'll be in command on the ground. Or do you think Lieutenant George has the experience and ability?"

"Now, what the hell am I supposed to say to that?" Arbold asked, his face reddening.

The men in the operations control room had continued their work, but the silence was deeper and Al knew they had listened. His jaw tightened. Arbold had done it again. He was the nice guy. What they were thinking about Colonel Banning wasn't printable. Banning wanted his men to like him; he craved affection, but he was



The phone rang, A sergeant speared it, listened for a moment, then held it toward him. "Your wife, Colonel."

Al frowned, Dorie knew he didn't like her to call him at a time like this. But she must be more than a little frightened so he kept the anger out of his voice.

"Honey, I've got Kay George here with me."

"Fine. I'll tell him."

"I think she is ready to go to the hospital."

"All right, I'll tell him."

"He knows," Dorie said. "She called him, and he told her that he might have to fly."

"So you're asking me to tell him he doesn't have to?"

There was a pause. "Yes, Al, that's what I'm asking."

He suddenly hated his job.

"I haven't got another pilot. The rest of the men will have to take care of things here on the ground. I need him to help me get an eight and a half million dollar piece of aircraft in the air. He can do more good there than he can outside a delivery room."

"More for you, honey, but not for her."

Al shook his head. "Dorie, I've got

absorbed in the mission. There really wasn't any choice.

In the wing briefing room, the crews jumped to attention and he let them hold it until he got to the stage and looked slowly around the room. Quietly he said, "Take your seats, gentlemen."

When the shuffling of feet, the muted coughs, the murmur of nearly two hundred men in Air Force green flying gear had died, he said, "I've yanked you out of your warm sacks at four o'clock in the morning because we're in a black area. I know you're tired. You've just finished an operational readiness test and this wing is ready, but all of our work will be for nothing if we lose these airplanes...." The faces were inscrutable, watching him. How many believed the way he did? He was still wondering as he slid into a seat beside Arbold on the front row, wondering if the eyes behind him were favorable, what the minds were thinking.

Captain Harkins gave the weather briefing, and the situation hadn't changed. The front was moving fast and had done some damage. A farmer had reported what he thought was a twister right along the front, but it hadn't touched the ground. At its present speed, the front would pass the base in two hours at the latest, maybe an hour and a half.

Arbold gave the evacuation briefing. The aircraft would take-off at two-minute intervals, half of them climbing on course to Goodland, the other half to Goode City. There they would stack down from 45,000 feet over the omni-directional radio ranges and await instructions from the base to return. Another ten minutes covered all of the details and the communications before the briefing was over and Arbold looked down at him.

Colonel Banning nodded, climbed the steps again and looked down at his crews. The easy way would be to have them stand by in their operations ready rooms, easier still to tell them to tie everything down and take a chance. That was probably what they wanted. He looked at the faces again. His mind made them lose their identity because he knew they were thinking of their wives and children and what might happen if a twister hit. It was hard to make his tense vocal cords behave.

"Let's go. I'll be in 4903 over Goodland. That's all."

Lieutenant George was waiting at the door.

"Your wife is over at my house," Al said. "Give her a call and tell her not to have the baby until we get back." He grinned and added, "Tell her that's an order."

The lieutenant didn't think it was funny. He just nodded and jumped for the telephone.

On the ramp, Al Banning looked to the northwest to the black ridge that was pushing over the horizon. Then he looked back at his crew. Lieutenant George looked rebellious. Major Feldon, slim and dapper with a touch of gray at the temples, was watching with an appraising eye. The third man was a Lincolnesque crew chief, Tech Sergeant Doherty. George joined him for the pre-flight inspection.

Major Feldon was running his preflight when they crawled up the ladder to the top deck. Al was finishing the interior cockpit check when the first of the '52s started taxiing down the ramp, a file of silver ducks going to the pond.

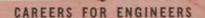
On interphone Al called to the crew chief outside to fire up the turbine in the 502 cart. When the compressed air entered the manifold he hit the starter button and in a few seconds the RPM gauge showed twelve percent. He held open the throttle to the idle position. The high

(Continued on page 173)



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BLACK AREA

whine came out of the J-57 as it accelerated to fifty-eight percent. Quickly Banning started the rest of the jets.

'Clear to taxi," George said. "Either the tower is weak or our radio is going

on the blink, Colonel."

Al nodded. "Okay, I'm taxiing out."
"Roger, clear on the right."

He tested the brakes and the crosswind gear as the 175-ton bird rolled with the push of the jets. At the runup pad he gripped the eight throttles and looked at the tail pipe temperatures and the fuel pressure and then, when George gave him the okay sign, swung the wheel to line up on the 12,000-foot-long runway.

The eight jets hungrily sucked in air, and more than 80,000 pounds of thrust forced the big craft down the concrete. At the 7,000-foot mark the '52 grabbed a hook and they were airborne. Al swung around on the heading that Feldon gave him and pointed the nose up, toward the men-

acing black curtain.

"I can't raise the tower," George said. "We don't have any radio."

'Keep trying."

"We aren't going to have any radio, Colonel. The other set is out, remember?

Al swung his head to the young pilot. The lieutenant had only one thing on his mind-his wife and baby. George wanted to abort the flight. had it in his blue eyes, had it there with the worry. "Relax," Al said.

In ten minutes they were topping the front at 37,000 feet and still climbing, with Feldon guiding him unerringly by radar through the areas of least turbulence.

The sky was clear five minutes after they passed the front and from 40,000 feet, he could look down and see nothing but dust. The strong surface winds had lifted topsoil from every Kansas wheat field it had passed, and Goodland was invisible. Below, he could see the other aircraft orbiting in gentle turns to the left.

"I've got contact with the forma-tion," George said, "but the radio is awfully weak."

Al grinned. "We got the birds off the ground, though. That's the important thing."

"Yes, sir."
"She'll be all right," Al said, his hand on the lieutenant's shoulder.

"That's easy for you to say, sir."

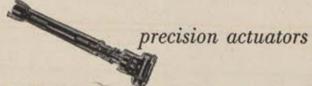
The circling began getting monotonous, and he turned the controls over to George and went back to the radio compartment. Feldon had the cover off the ultra-high-frequency set and

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was trying new tubes. Al found a crushed candy bar in his flying suit pocket. It reminded him that he hadn't had any breakfast. He offered the navigator the bar and Feldon looked at it for a long moment before he shook his head.

Al nibbled on the chocolate while he watched the navigator systematically run through the tubes. Feldon finally threw up his hands and replaced the cover. He pursed his lips before he said, "George wants to land back home the worst way.'

I know it, but there are four of us and a lot of money tied up in this magnesium monster. Rapid City is clear."

"You're going to fly back and take

a look at the base, aren't you?" Al lit another cigarette. "If we have the fuel."

"I can bring you in on radar."

"It will depend on how long we have to orbit," he said and went back to his seat. It was possible for a navigator to give a radar approach-a good navigator like Feldon using the fabulous K-System. On the scope the runway would be a thin, black rectangle. A steady rate of descent with a check on altitude and a good operator could bring a pilot right over the end of the runway. But that was an emergency measure and Ellsworth at Rapid City was clear, but he could take a look. He could at least do that for George

(Continued on following page)

as long as he had enough gas to try. In an hour the recall came and as the last of the '52s headed home, he waited five minutes and then took up the heading that Feldon gave him. When the ETA was up he was hoarse from calling the base. A minute later the tower came through, so weak he could hardly hear it. Then it faded and he began to turn, found the spot again and circled. They were over the field. He shifted to the GCA channel. All that he understood was that his was the only aircraft in the area, that the ceiling was 1,000 feet and visibility was one mile and going down.

"Tell them we're going to Ellsworth," Al said.

The lieutenant's thumb was on the transmitting button, but he didn't depress it. Feldon's voice came over the

"Want to have a try at a radar assist?"

"Major Feldon can do it," George said quickly.

Al glared at the pleading eyes and then back to the sheet of dust. He didn't like to rely on something like this. It wasn't so bad with GCA, but even then he didn't like it. He had never liked to rely on anyone else. He had lone-wolfed it for years. It suited him.

"Please, sir!"

His eyes swept the fuel gauges. He had enough for one letdown and a pass at the field, but it was risky and he wanted to live as bad as the next man and there wasn't any sense in throwing away a B-52 because a young lieutenant had a date with the stork. But his finger was on the mike button and he was telling the tower that he would make a jet penetration and try a radar assist. If the tower answered, he didn't hear it because he had swung around and was homing on the omni-directional radio range.

The '52 plunged toward the heavier air below. Al dried his hands on his flying suit and crammed his unlit cigarette in the ash tray. This made no sense. He was placing himself, the other crew members, and the airplane in Feldon's hands, but he held the descent. He leveled off and the navigator came through on interphone with a heading, and there was sharp, crisp confidence in the voice. Al flew the headings and when the navigator called for a steady rate of descent he glued to the instruments and they were in the dust and he wanted to pull up.

"Altitude two thousand," George called out.

"Be ready for climb," Al said and

resisted the urge to pull up on the wheel. He took his right hand off the wheel and grasped the throttles. At 1,500 feet his knuckles whitened, but he held the heading and jockeyed the big bird as it bored through the red blanket. Feldon's confidence buoyed

"Runway dead ahead," Feldon said. "Three miles out."

"One thousand feet," George said. He could see nothing, could feel a touch of panic. He must have been crazy to try this! "Give me climb power," Al said and saw the throttle advancing as the dim shape of the runway came out of the haze. "Pull off the power," he shouted, "got it in sight!"

He was lined up perfectly and he killed the gusty cross wind with crab and cranked in the correction to the four main landing gears. The crosswind gear would pay dividends. He flew it right on in and popped the drag chute as Feldon came up and squatted at his side.

"Nice," the navigator said, "real

nice and professional."

"Just following orders," Al said, grinning with pleasure, the tenseness wiped away. There was a difference now, but he didn't know exactly why. They tracked the "Follow Me" jeep to base operations. George was frantically shedding his gear as he followed Al out of the airplane. Jim Arbold was waiting in the dust, shielding his eyes against the flying sand. He told George that his wife had gone to the hospital.

"Have a boy," Al said.

"Is that an order?" George asked

with a smile.

"A request from the godfather." "You've got a deal," George said

and sprinted toward the gate. "You were right about the wind,

Al," Jim said. "One of the hangars collapsed on a '52 and a Charley fourseven is a washout. You taught me something today."

"I learned a lot, myself, thanks to Major Feldon."

"We all learned a lot," Feldon said. "These crews will follow you anywhere now, Colonel."

Dorie was in the kitchen when he got home. She was cooking eggs, and she purred and poured him a cup of coffee after he buried his nose in her fragrant hair. She brought her eyes up and they were smiling.

"Honey . . . thank heaven we have characters like you.'

"Sunnyside up," he said and cleared his throat, and the grin felt good and natural on his face,-END



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Guide to



AIR FORCE BASES

- Where they are
- How they were named
- The housing situation

ABILENE AFB, Tex., 6 mi. SW of Abilene. Medium bomber base, 15th AF, SAC. Formerly Abilene Army Airfield, also known as Tye Field and Abilene Municipal Airport #1; named for city. Housing: officers, fair; airmen, fair.

AERONAUTICAL CHART & INFORMATION CENTER, Mo., 2d and Arsenal Sts., St. Louis. Maps and charts, MATS. Housing: officers, fair; airmen, fair.

ALTUS AFB, Okla., 2 mi. E of Altus, Medium bomber base, 15th AF, SAC; named for city. Housing: officers, fair; airmen, poor.

AMARILLO AFB, Tex., 14 mi. SE of Amarillo. 3320th Retraining Group; jet mechanics and airframe repair schools, TTAF, ATC; named for city. Housing: officers, excellent; airmen, excellent.

ANDREWS AFB, Md., 1 mi. E of Camp Springs, 11 mi. SE of Washington, D. C. Hq., MATS; Hq., AWS; fighter-interceptor base, EADF, ADC; formerly Pyles Field, renamed for Lt. Gen. Frank M. Andrews, pioneer exponent of airpower, CG of US forces in Europe, killed in aircraft accident, Iceland, 1943. Housing: officers, good; airmen, good.

ARDMORE AFB, Okla., 16 mi. NE of Ardmore. Troop carrier base, 18th AF, TAC; named for city. Housing: officers, poor; airmen, poor.

ARNOLD ENGINEERING DEVELOPMENT CENTER, Tenn., 10 mi. E of Tullahoma. Hq., AEDC; named for Gen. H. H. "Hap" Arnold, WW II AF Commanding General. Housing: officers, excellent; airmen, excellent.

BAINBRIDGE AB, Ga., 7 mi. NW of Bainbridge. Primary contract pilot training, FTAF, ATC; named for city. Housing: officers, poor; airmen, poor.

BAKALAR AFB, Ind., 3 mi. N of Columbus. Reserve training, 10th AF, ConAC; formerly Atterbury AFB; renamed for Lt. John E. Bakalar, a World War II fighter pilot, killed in

France, September 1944. Housing: officers, fair; airmen, fair. BARKSDALE AFB, La., 1 mi. S of Bossier City, 6 mi. E of Shreveport. Hq., 2d AF, SAC; medium bomber base; named for Lt. Eugene H. Barksdale, WW I pilot killed near Wright Field, Ohio, August 1926, while testing observation-type plane. Housing: officers, excellent; airmen, excellent.

BARTOW AB, Fla., 5 mi. NE of Bartow. Primary contract pilot training, FTAF, ATC; named for city. Housing: officers, excellent; airmen, excellent.

BEALE AFB, Calif., 11 mi. SE of Marysville. Named for Camp Beale, for Brig. Gen. Edward F. Beale, California Indian agent before the Civil War. Housing: officers, good; airmen, good.

BERGSTROM AFB, Tex., 7 mi. SE of Austin. Strategic fighter base, 2d AF, SAC; formerly Del Valle AAB; renamed for Capt. John A. E. Bergstrom of Austin, killed at Clark Field, P. I., December 1941, during Jap bombardment. Housing: officers, excellent; airmen, excellent.

BIGGS AFB, Tex., 6 mi, NW of El Paso. Heavy bomber base, 15th AF, SAC; named for Lt. James B. Biggs, WW I fighter pilot, killed in a take-off accident in France, October 1918. Housing: officers, fair; airmen, fair.

BLYTHEVILLE AFB, Ark., 3 mi. NW of Blytheville. Tactical bombardment base, 9th AF, TAC; named for city. Housing:

officers, poor; airmen, poor.

BOLLING AFB, 3 mi. S of Washington, D. C. Hq. Command, USAF; named for Col. Raynal C. Bolling, Asst. Chief of Air Service, died saving life of a 19-year-old private near Amiens, France, 1918. Housing: officers, excellent; airmen, good.

BROOKLEY AFB, Ala., 3 mi. SSW of Mobile. Air Materiel Area, AMC; foreign clearing station, MATS; formerly Bates Field; renamed for Capt. Wendell H. Brookley, test pilot, killed in BT-2B crash near Bolling Field, February 1934. Housing: officers, fair; airmen, fair.

BROOKS AFB, Tex., 7 mi. SSE of San Antonio. Reserve train-

ing, 14th AF, ConAC; Hq., Air Evacuation, MATS; formerly Gosport Field; renamed for Lt. Sidney J. Brooks, Jr., of San Antonio, killed in air crash near Hondo, Tex., November 1917, on final day of cadet training and commissioned posthumously. Housing: officers, excellent; airmen, excellent.

BRYAN AFB, Tex., 6 mi. WSW of Bryan. Basic single-engine jet pilot training, FTAF, ATC; named for city. Housing: offi-

cers, fair; airmen, fair.

BUNKER HILL AFB, Ind., 2 mi. E of Bunker Hill. Fighterbomber base, 9th AF, TAC; fighter-interceptor base, EADF, ADC. Former Naval Air Station; named for city. Housing: officers, fair; airmen, fair.

BURLINGTON MUNICIPAL AP, Vt., 3 mi. E of Burlington. Fighter-interceptor base, EADF, ADC; named for city. Housing

at Ethan Allen AFB.

BYRD FIELD, Va., 7 mi. ESE of Richmond. Reserve training; medium troop carrier; 1st AF, ConAC. Named locally. No housing information available.

CAMPBELL AFB, Ky., 14 mi. S of Hopkinsville. Air base squadron, 8th AF, SAC; named for Fort Campbell, for Gen. William Bowen Campbell, 19th century Tennessee governor, Indian fighter, and public figure. Housing: officers, fair; airmen, fair.

CARSWELL AFB, Tex., 7 mi. WNW of Fort Worth. 2d AF, SAC; heavy bomber base; formerly Tarrant Field, renamed for Maj. Horace S. Carswell, Jr., of Fort Worth, WW II B-24 pilot and winner of CMH, killed in China, October 1944. Housing:

officers, excellent; airmen, excellent.

CASTLE AFB, Calif., 7 mi. NW of Merced. Heavy bomber base, 15th AF, SAC; fighter-interceptor base, WADF, ADC; formerly Merced Field; renamed for Brig. Gen. Frederick W. Castle, WW II B-17 pilot and winner of CMH, killed over Germany, 1944. Housing: officers, excellent; airmen, good. CHANUTE AFB, Ill., 1 mi. SE of Rantoul. Aircraft mainte-

CHANUTE AFB, Ill., 1 mi. SE of Rantoul. Aircraft maintenance and weather schools, home of 3499th Mobile Training Wing, TTAF, ATC; named for Octave Chanute, aviation pioneer and navigation engineer, died in US, 1910. Housing: officers, fair; airmen, poor.

CHARLESTON AFB, S. C., 10 mi. N of Charleston. Air transport base, MATS; fighter-interceptor base, EADF, ADC; named

for city. Housing: officers, poor; airmen, poor.

CHELI AF STATION, Calif., 1 mi. WSW of Maywood. Spe-

cialized depot, AMC; renamed for Maj. Ralph Cheli, CMH winner, died March 6, 1944, while a Japanese prisoner, Housing: officers, good; airmen, fair.

CLINTON COUNTY AFB, Ohio, 2 mi. SE of Wilmington. Reserve training, 1st AF, ConAC; named geographically. Hous-

ing: officers, good; airmen, fair.

CLOVIS AFB, N. Mex., 7 mi. W of Clovis. Fighter-bomber base, 9th AF, TAC; named for city. Housing: officers, fair; airmen, fair.

COLUMBUS AFB, Miss., 9 mi. N of Columbus. Air base squadron, 2d AF, SAC; named for city. Housing: officers, excellent; airmen, excellent.

CRAIG AFB, Ala., 5 mi. SE of Selma. Instructor pilot training, FTAF, ATC; named for Bruce K. Craig, flight engineer for B-24 manufacturer, killed during B-24 test flight, in US, 1941. Housing: officers, excellent; airmen, good.

DALLAS NAS, Tex. (Hensley Field), 11 mi. SSW of Dallas. Reserve training, 14th AF, ConAC; joint use with Navy; named for Maj. William N. Hensley, airpower pioneer, died in US, 1929. Housing: officers, good; airmen, good.

DAVIS FIELD, Okla., 6 mi. S of Muskogee. Reserve training; fighter-bomber base; 14th AF, ConAC. Named locally. No

housing information available.

DAVIS-MONTHAN AFB, Ariz., 4 mi. SE of Tucson. Medium bomber base, 15th AF, SAC; fighter-interceptor base, CADF, ADC; formerly Tucson Municipal Airport, renamed for Lt. Samuel H. Davis, killed in US, 1921, and Lt. Oscar Monthan, bomber pilot, killed in Hawaii, 1924. Housing: officers, excellent; airmen, excellent.

DOBBINS AFB, Ga., 2 mi. SE of Marietta. Reserve training, 14th AF, ConAC, EADF, ADC, joint use; formerly Marietta AFB; renamed for Capt. Charles M. Dobbins, killed transporting paratroopers over Sicily, July 1943. Housing: officers, excel-

lent; airmen, excellent.

DONALDSON AFB, S. C., 7 mi. SSE of Greenville. Hq., 18th AF, TAC; troop carrier base; formerly Greenville AFB; renamed for Maj. John O. W. Donaldson, fourth ranking US ace in WW I, killed in flying accident near Philadelphia, September 1930, during aerial circus. Housing: officers, good; airmen, good. DOVER AFB, Del., 3 mi. SE of Dover. Air transport base,

DOVER AFB, Del., 3 mi. SE of Dover. Air transport base, MATS; fighter-interceptor base, EADF, Air Defense Com-(Continued on following page)

Glossary of Terms Used in Guide to Air Force Bases

AAB	Army Air Base	co	Commanding Officer
AB	Air Base	ConAC	Continental Air Command
A/C	Aircraft	ConAD	Continental Air Defense Comman
ADC	Air Defense Command	CTAF	Crew Training Air Force
AEDC	Arnold Engineering Development	DFC	Distinguished Flying Cross
	Center	DSC	Distinguished Service Cross
AF	Air Force	EADF	Eastern Air Defense Force
AFB	Air Force Base	FTAF	Flying Training Air Force
AMC	Air Materiel Command	MATS	Military Air Transport Service
AP	Airport	NAS	Naval Air Station
ARDC	Air Research and Development	SAC	Strategic Air Command
	Command	TAC	Tactical Air Command
ATC	Air Training Command (formerly	TTAF	Technical Training Air Force
	ATRC)	USAF	United States Air Force
AU	Air University	WADC	Wright Air Development Center
CADE	Central Air Defense Force	WADE	Western Air Defense Force
CG	Commanding General	wwi	World War One
CMH	Congressional Medal of Honor	ww II	World War Two

mand; named for city, Housing: officers, poor; airmen, poor. DOW AFB, Me., 2 mi. W of Bangor. Air refueling base, 8th AF, SAC; formerly Bangor AB; renamed for 2d Lt. James F. Dow of Oakfield, Me., killed in crash near Mitchel Field, June 1940. Housing: officers, good; airmen, good.

1940. Housing: officers, good; airmen, good.

DULUTH MUNICIPAL AP, Minn., 7 mi. NNW of Duluth,
Fighter-interceptor base, CADF, ADC; formerly Williamson-

Johnson AP. Housing: officers, fair; airmen, fair.

EDWARD GARY AFB, Tex., 5 mi. E of San Marcos. Liaison helicopter pilot and mechanic schools, FTAF, ATC; formerly San Marcos AFB; renamed for 2d Lt. A. Edward Gary, native of San Marcos and WW II B-17 co-pilot, killed at Clark Field, Philippines, December 1941. Housing: officers, fair; airmen, fair. EDWARDS AFB, Calif., 2 mi. S of Muroc. Hq., AF Flight Test Center, ARDC; formerly Muroc AFB; renamed for Capt. Glen W. Edwards, test pilot, killed at Muroc Field, June 1948, in crash of YB-49 "Flying Wing." Housing: officers, good; airmen, fair.

EGLIN AFB, Fla., 2 mi. SW of Valparaiso. Hq., Air Proving Ground; Hq., AF Armament Center, ARDC; named for Lt. Col. Frederick I. Eglin, killed in US, 1937. Housing: officers, fair; airmen, fair.

EGLIN AF AUXILIARY FIELD #9 (Hurlburt Field), Fla., 6 mi. W of Fort Walton. Tactical bomber base, 9th AF, TAC. On Eglin AFB reservation. Housing: officers, fair; airmen, fair.

ELLINGTON AFB, Tex., 16 mi. SE of Houston. Observer training, FTAF, ATC; named for 2d Lt. Eric L. Ellington, killed during training flight near San Diego, 1913. Housing: officers, excellent; airmen, excellent.

ELLSWORTH AFB, S. D., 8 mi. NE of Rapid City. Heavy bomb wing, 15th AF, SAC; fighter-interceptor base, CADF, ADC; formerly Rapid City AFB; renamed for Brig. Gen. Richard E. Ellsworth, killed in B-36 crash in Newfoundland, March

18, 1953. Housing: officers, good; airmen, good.

ENGLAND AFB, La., 6 mi. NNW of Alexandria. Fighter-bomber base, 9th AF, TAC; formerly Alexandria AFB; renamed for Lt. Col. John B. England, WW II ace killed in air crash in France, November 17, 1954. Housing: officers, fair; airmen, fair. ENT AFB, Colo., Colorado Springs. Hq., ADC; named for Maj. Gen. Uzal G. Ent, CG, 2d AF, recipient of DSC, died in 1948. Housing: officers, fair; airmen, fair.

ETHAN ALLEN AFB, Vt., 2 mi. E of Winooski. Housing and administration for Burlington Municipal AP, EADF, ADC; named for the famed Revolutionary War leader of the Green Mountain Boys. Housing: officers, good; airmen, good.

FAIRCHILD AFB, Wash., 11 mi. WSW of Spokane. Heavy bomber base, 15th AF, SAC; formerly Spokane AFB; renamed for Gen. Muir S. Fairchild, WW I bomber pilot, Vice Chief of Staff, USAF, died of heart attack, Washington, D. C., March

1950. Housing: officers, good; airmen, good.

FORBES AFB, Kan., 7 mi. S of Topeka. Medium strategic recon base, replacement training center, 8th AF, SAC; formerly Topeka AAB; renamed for Maj. Daniel H. Forbes, Jr., WW II bomber pilot, killed at Muroc Field in the crash of the YB-49 "Flying Wing" June 1948. Housing: officers, fair; airmen, fair. FOSTER AFB, Tex., 5 mi. NE of Victoria. Fighter-bomber and day-fighter base, 9th AF, TAC; named for 1st Lt. Arthur L. Foster of Georgetown, Tex., killed in air crash near Brooks Field, February 1925. Housing: officers, good; airmen, fair. FRANCIS E. WARREN AFB, Wyo., 2 mi. W of Cheyenne.

Supply, administrative, and motor vehicle maintenance schools, TTAF, ATC; named for first US Senator from Wyoming, first elected governor in the state, Civil War winner of CMH, died in US, 1929. Housing: officers, fair; airmen, fair.

GADSDEN AF STATION, Ala., 3 mi. S of Gadsden. Specialized depot, AMC; named for city. Housing: officers, excellent; airmen, excellent.

GEIGER FIELD, Wash., 6 mi. WSW of Spokane. Fighterinterceptor base, WADF, ADC; formerly Sunset Field; renamed for Maj. Harold Geiger, WW I dirigible expert, killed while crash landing at Olmsted Field, May 1927. Housing: officers, good; airmen, good.

GEN. MITCHELL FIELD, Wis., 6 mi. S of Milwaukee, Reserve

training, ConAC. Also known as Milwaukee County AP. Named for Gen. Billy Mitchell, pioneer flyer whose defiant faith in airpower brought about his court martial, died in US, 1936. Housing: officers, good; airmen, good.

GENTILE AF STATION, Ohio, 2 mi. SE of Dayton. Specialized depot, AMC; renamed for Maj. Don S. Gentile, WW II fighter ace, credited with destroying thirty-two German aircraft. Killed in an aircraft accident near Andrews AFB, Md., on Jan-

uary 28, 1951. Housing: officers, good; airmen, good.
GEORGE AFB, Calif., 6 mi. NW of Victorville. Fighter-inter-

ceptor and day-fighter base, 9th AF, TAC; fighter-interceptor base, WADF, ADC; formerly Victorville AAB; renamed for Brig. Gen. Harold H. George, WW I ace, commander of US Air Forces in Australia in WW II, killed in Australia, April 1942. Housing: officers, good; airmen, excellent.

GOODFELLOW AFB, Tex., 2 mi. SE of San Angelo. Basic

GOODFELLOW AFB, Tex., 2 mi. SE of San Angelo. Basic multi-engine pilot training, FTAF, ATC; named for Lt. John J. Goodfellow, Jr., of San Angelo, killed in fighter combat, France, September 1918. Housing: officers, good; airmen, good.

GRAHAM AB, Fla., 5 mi. NE of Marianna. Primary contract pilot training, FTAF, ATC; named after operator of field; formerly Marianna AB. Housing: officers, fair; airmen, fair.

GRANDVIEW AFB, Mo., 16 mi. S of Kansas City. Hq., CADF, ADC; formerly Grandview AP; named for nearby city. Housing:

officers, good; airmen, good.

GRAY AFB, Tex., 6 mi. SW of Killeen. Special activities base, 2d AF, SAC; formerly Camp Hood AAB; renamed for Capt. Robert M. Gray, pilot on first Tokyo bombing mission of WW II, killed in India, 1942. Housing: officers, poor; airmen, poor. GREATER PITTSBURGH AP, Penna., 5 mi. SW of Coraopolis. Fighter-interceptor base, EADF, ADC; named for nearby city. Housing: officers, good; airmen, fair.

city. Housing: officers, good; airmen, fair. GREENVILLE AFB, Miss., 6 mi. NE of Greenville. Basic single-engine pilot training school, FTAF, ATC; named for city.

Housing: officers, fair; airmen, fair.

GRENIER AFB, N. H., 4 mi. S of Manchester. Reserve training, 1st AF, ConAC; named for 2d Lt. Jean D. Grenier of Manchester, killed in US, 1934, while in snowstorm during air mail test run. Housing: officers, fair; airmen, fair.

GRIFFISS AFB, N. Y., 2 mi. NE of Rome. Hq., Rome Air Development Center, ARDC; Rome AF Depot, AMC; fighter-interceptor base, EADF, ADC; formerly Rome AB; renamed for Lt. Col. Townsend E. Griffiss of Buffalo, recipient of DSC, killed in flight from Russia to England, February 1942. Hous-

ing: officers, fair; airmen, fair.

GUNTER AFB, Ala., 5 mi. NE of Montgomery. Extension
Course Institute, USAF (AU); School of Aviation Medicine,
USAF (AU); named for William A. Gunter, mayor of Montgomery for 27 years, ardent exponent of airpower, died in 1940.

Housing: officers, fair; airmen, fair.

HAMILTON AFB, Calif., 6 mi. NNE of San Rafael. Hq., WADF, ADC; Hq., 4th AF, ConAC; formerly Marin Meadows; renamed for 1st Lt, Lloyd A. Hamilton, recipient of DSC, killed in fighter combat, France, August 1918. Housing: officers, good; airmen, good.

HARLINGEN AFB, Tex., 3.5 mi. NE of Harlingen. Observer training, FTAF, ATC; named for city. Housing: officers, good;

airmen, good.

HILL AFB, Utah, 6 mi. S of Ogden. Hq., Air Materiel Area, AMC; named for Maj. Ployer P. Hill, killed near Wright Field while testing one of first B-17s, October 1935. Housing: officers, good; airmen, good.

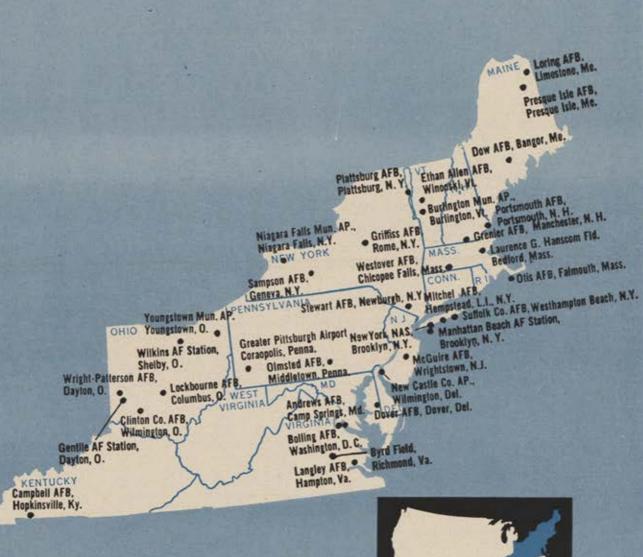
HOLLOMAN AFB, N. Mex., 8 mi. SW of Alamogordo. Hq., Holloman Air Development Center, ARDC; formerly Alamogordo AAB; renamed for Col. George V. Holloman, guided missile pioneer, killed in air crash in Formosa, March 1946. Housing: officers, fair; airmen, fair.

HOMESTEAD AFB, Fla., 5 mi. NNE of Homestead. Medium bomber base, 2d AF, SAC; named for city. Housing: officers,

poor; airmen, poor.

HONDO AB, Tex., 1 mi. NW of Hondo. Primary contract pilot training, FTAF, ATC; named for city. Housing: officers, fair; airmen, fair.

HUNTER AFB, Ga., 3 mi. SW of Savannah. Medium bomber (Continued on page 180)





MAJOR ACTIVE AIR FORCE BASES IN NORTHEAST US

This year, instead of printing one big map of AF bases in the US, we divided the nation into four parts and put each on a separate page. The blown-up section (top) corresponds to the shaded portion (inset) in each case. The breakdown corresponds to ConAC's four numbered AFs (First AF above), but each area has bases under jurisdiction of other commands. (Other maps of bases are on pages 181, 183, and 185.)

base, 2d AF, SAC; named for Maj, Gen. Frank O'D, Hunter, WW I ace, recipient of DSC, four clusters; past AFA Director. Housing: officers, good; airmen, good.

INDIAN SPRINGS AFB, Nev., 1 mi. NW of Indian Springs. Special weapons testing base, ARDC; named for city. Housing: officers, poor; airmen, poor.

JAMES CONNALLY AFB, Tex., 7 mi. NNE of Waco. Observer training, FTAF, ATC; formerly Waco AFB; renamed for Col. James T. Connally of Waco, killed on B-29 mission over Yokohama, Japan, May 1945. Housing: officers, good; airmen, good.

KEESLER AFB, Miss., 2 mi. WNW of Biloxi. Electronics, communications, and radar schools, TTAF, ATC; named for Lt. Samuel R. Keesler, Jr., of Greenwood, Miss., aerial observer, killed on special bombing mission near Verdun, France, October 1918. Housing: officers, excellent; airmen, excellent.

KELLY AFB, Tex., 6 mi. WSW of San Antonio. Hq., Air Materiel Area, AMC; Hq., Continental Division, MATS; named for Lt. George E. M. Kelly, a pioneer Army pilot who was killed in the US, 1911. Housing: officers, excellent; airmen, excellent. KINROSS AFB, Mich., 3 mi. SE of Kinross. Fighter-interceptor base, EADF, ADC; named for nearby city. Housing: officers, fair; airmen, fair.

KIRTLAND AFB, N. Mex., 4 mi. SSE of Albuquerque. Hq., AF Special Weapons Center, ARDC; fighter-interceptor base, CADF, ADC; formerly Albuquerque AAB; renamed for Col. Roy S. Kirtland, aviation pioneer and former CO of Langley Field, died in 1941. Housing: officers, good; airmen, good.

K. I. SAWYER AP, Mich., 16 mi. S of Marquette. Fighterinterceptor base, EADF, ADC; origin of name unknown. Housing: officers, poor; airmen, poor,

KLAMATH FALLS MUNICIPAL AIRPORT, Ore., 5 mi, SE of Klamath Falls. Fighter-interceptor base, WADF, ADC; named for nearby city. Housing: officers, poor; airmen, poor,

LACKLAND AFB, Tex., 7 mi. WSW of San Antonio. Basic training, OCS, WAF training, pilot-observer pre-flight, USAF Recruiting School, USAF Chaplain School, TTAF, ATC; Hq., AF Personnel and Training Research Center, ARDC; formerly San Antonio Aviation Cadet Center; renamed for Brig. Gen. Frank D. Lackland, former Commandant of Kelly Field flying school, died in 1943. Housing: officers, excellent; airmen, ex-

LAKE CHARLES AFB, La., 3 mi. E of Lake Charles. Medium bomber base, 2d AF, SAC; named for city. Housing: officers, fair; airmen, fair.

LANGLEY AFB, Va., 3 mi. N of Hampton. Hq., TAC; fighter-bomber and tactical bomber base; fighter-interceptor base, EADF, ADC; named for Samuel P. Langley, pioneer aeronautical scientist, died in 1906. Housing: officers, fair; airmen, fair. LAREDO AFB, Tex., 3 mi. NE of Laredo. Single-engine jet pilot training, FTAF, ATC; named for city. Housing: officers, poor; airmen, poor.

LARSON AFB, Wash., 6 mi. NNW of Moses Lake. Troop carrier base, 18th AF, TAC; fighter-interceptor base, WADF, ADC; formerly Moses Lake AFB; renamed for Maj. Donald A. Larson, native of Yakima, Wash., WW II ace, killed on fighter mission over Ulzen, Germany, August 1944. Housing: officers, good; airmen, good.

LAUGHLIN AFB, Tex., 7 mi. E of Del Rio. Basic singleengine pilot training, FTAF, ATC; named for Lt. Jack T. Laughlin, pilot killed in action in Far East, 1942. Housing: officers, fair; airmen, fair.

LAURENCE G. HANSCOM FIELD, Mass., 1 mi. SSW of Bedford, Hq., AF Cambridge Research Center, ARDC; fighterinterceptor base, EADF, ADC; formerly Bedford AFB; renamed for Laurence Hanscom, Boston and Worcester newspaperman, Army Reserve pilot, killed near base, 1941. Housing: officers, good; airmen, fair.

LINCOLN AFB, Neb., 5 mi. NW of Lincoln. Medium bomber base, 8th AF, SAC; named for city. Housing: officers, fair; airmen, fair,

LITTLE ROCK AFB, Ark., 15 mi. NE of Little Rock. Medium bomber, strategic recon base, 2d AF, Strategic Air Command; named for city. Housing: officers, fair; airmen, fair. LOCKBOURNE AFB, Ohio, 11 mi. SSE of Columbus. Strategic recon bomber base, 8th AF, SAC; named for city. Housing: officers, fair; airmen, fair.

LONG BEACH MUNICIPAL AP, Calif., 3 mi. NE of Long Beach. Reserve training, fighter base, 4th AF, ConAC; named

for city. Housing: officers, good; airmen, good.

LORING AFB, Me., 2 mi. NW of Limestone. Heavy bomber base, 8th AF, SAC; formerly Limestone AFB; renamed for Maj. Charles J. Loring, Jr., CMH winner, killed in Korea in November, 1952 when he crashed his damaged F-80 into enemy artillery emplacements, destroying them. Housing: officers, good; airmen, good.

LOWRY AFB, Colo., 5 mi. ESE of Denver. Interim USAF Academy; special weapons, flexible gunnery, armament, and photographic schools, TTAF, ATC; named for Lt. Francis B. Lowry of Denver, recipient of DSC, killed on photo mission over France, September 1918; only Colorado airman to be killed in WW I. Housing: officers, good; airmen, good.

LUKE AFB, Ariz., 20 mi. WNW of Phoenix. Combat crew training, fighters, ATC; named for Lt. Frank Luke, Jr., "balloon-busting" WW I ace, winner of CMH and recipient of DSC, killed in France, September 1918. Housing: officers, good; airmen, good.

MacDILL AFB, Fla., 8 mi. SSW of Tampa. Medium bomber base, 2d AF, SAC; named for Col. Leslie MacDill, fighter pilot, killed in air crash at Anacostia, Md., 1938. Housing: officers, excellent; airmen, excellent.

MALDEN AB, Mo., 4 mi, N of Malden. Primary contract pilot training, FTAF, ATC; named for city. Housing: officers, fair; airmen, fair.

MALLORY AF STATION, Memphis, Tenn. Specialized depot, AMC; renamed for Maj. William N. Mallory, WW II intelligence officer with the 1st Tactical AF, killed returning home

in 1945. Housing: officers, good; airmen, good.
MALMSTROM AFB, Mont., 4 mi. E of Great Falls. Strategic fighter base, 15th AF, SAC; fighter-interceptor base, CADF, ADC; formerly Great Falls AFB, renamed for Col. Einar A. Malmstrom, killed in airplane accident near Great Falls, August 21, 1954. Housing: officers, fair; airmen, good.

MANHATTAN BEACH AF STATION, N. Y., Brooklyn, N. Y. Overseas replacement depot, 1st AF, ConAC; named geographically. Housing: officers, fair; airmen, fair.

MARANA AB, Ariz., 35 mi. NW of Tucson. Primary contract pilot training, FTAF, ATC; named for nearby city. Housing: officers, poor; airmen, poor.

MARCH AFB, Calif., 9 mi. SE of Riverside. Hq., 15th AF, SAC; medium bomber base; named for Lt. Peyton C. March, Jr., son of WW I Army Chief of Staff, killed in air crash in US, 1918. Housing: officers, excellent; airmen, good.

MATAGORDA ISLAND AIR FORCE RANGE, Tex., 9 mi. SSW of Port O'Connor. Training installation, 2d AF, SAC; named for island in Gulf of Mexico. Housing: officers, fair; airmen, fair. MATHER AFB, Calif., 10 mi. E of Sacramento. Observer training, FTAF, ATC; named for Lt. Carl S. Mather, killed near Ellington Field during training flight, 1918, five days after receiving commission. Housing: officers, good; airmen, good.

MAXWELL AFB, Ala., 1 mi. WNW of Montgomery. Hq., Air University; Air War College; Air Command and Staff College; Hq., AF-ROTC Research Studies Institute; named for 2d Lt. William C. Maxwell of Natchez, killed on Luzon, Philippines, August 1920, while attempting emergency landing. Housing: officers, good; airmen, good.

McCHORD AFB, Wash., 8 mi. S of Tacoma. Fighter-interceptor base, WADF, ADC; air rescue base, foreign clearing station, MATS; named for Col. William C. McChord, killed in

US, 1937. Housing: officers, good; airmen, good.

McCLELLAN AFB, Calif., 10 mi. NE of Sacramento. Hq., Air Materiel Area, AMC; air division (aircraft early warning and control) Hq., ADC; named for Maj. Hezekiah McClellan, pioneer in Arctic aeronautical experiments, killed in test flight of new plane, US, 1936. Housing: officers, good; airmen, fair. McCONNELL AFB, Kan., 5 mi. SE of Wichita. Medium

bomber crew training, CTAF, ATC; formerly Wichita AFB; (Continued on page 182)



aries of ConAC's Tenth AF, but includes bases under other commands. For bases in the Northeast, see page 179; South, see page 183; and West, see page 185.

renamed for the two McConnell brothers of Wichita, Thomas L., killed July 10, 1943, in the S. Pacific, and Fred M., Jr., killed in 1945 in a private plane crash in Kansas. Housing: officers, fair; airmen, fair.

McGHEE-TYSON AP, Tenn., 12 mi. SSW of Knoxville. Fighterinterceptor base, EADF, ADC; named for Charles McGhee Tyson, WW I flyer whose family donated land for the airport.

Housing: officers, good; airmen, good.

McGUIRE AFB, Fort Dix, N. J., 1 mi. SE of Wrightstown.

Hq., Atlantic Division, MATS; fighter-interceptor base, EADF, ADC; formerly Fort Dix AAB; renamed for Maj. Thomas B. McGuire, Jr., of Ridgewood, N. J., 2d ranking WW II ace, P-38 pilot, winner of CMH, recipient of DSC, killed over Leyte, 1945. Housing: officers, fair; airmen, fair.
MEMPHIS MUNICIPAL AP, Tenn., 6 mi. SSE of Memphis.

Reserve training, 14th AF, ConAC; named for city. Housing:

officers, excellent; airmen, good.

MIAMI INTERNAT'L AP, Fla., 5 mi. NW of Miami. Reserve training, 14th AF, ConAC; named for city. Housing: officers,

excellent; airmen, excellent.

MINNEAPOLIS-ST. PAUL INTERNAT'L AP, Minn., 7 mi. SSE of Minneapolis. Fighter-interceptor base, CADF, ADC; Reserve training, 10th AF, ConAC; formerly Wold Chamberlain Field, renamed for twin cities. Housing: officers, good; air-

MITCHEL AFB, N. Y., 2 mi. NE of Hempstead, L. I. Hq., ConAC; Hq., 1st AF; named for Maj. John P. Mitchel, first Fusion mayor of NYC, fighter pilot, killed in air crash in Louisiana, July 1918. Housing: officers, fair; airmen, fair.

MOODY AFB, Ga., 12 mi. NNE of Valdosta. Interceptor crew training, CTAF, ATC; weapons training center, ADC; named for Maj. George P. Moody, fighter pilot, killed in US, 1941.

Housing: officers, poor; airmen, poor.

MOORE AB, Tex., 14 mi. S of Mission. Primary contract pilot training, FTAF, ATC. Reactivated in 1954. Housing: officers,

excellent; airmen, excellent.

MOUNTAIN HOME AFB, Idaho, 11 mi. WSW of Mountain Home. Medium bomber base, 15th AF, SAC; named for city. Housing: officers, excellent; airmen, excellent.

MYRTLE BEACH AFB, S. C., 3 mi. SW of Myrtle Beach. Fighter base, 9th AF, TAC; named for city. Housing: officers, poor; airmen, poor.

NELLIS AFB, Nev., 8 mi. NE of Las Vegas. Fighter-bomber crew training, fighter weapons, CTAF, ATC; formerly Las Vegas AFB; renamed for Lt. William H. Nellis of Las Vegas, fighter pilot, killed in action over Luxembourg, December 1944. Housing: officers, good; student officers, fair; airmen, good.

NEW CASTLE CO. AP, Del., 5 mi. SW of Wilmington. Fighter-interceptor base, EADF, ADC; named geographically.

Housing: officers, good; airmen, good.

NEW YORK NAS, N. Y. (Floyd Bennett Field). Reserve training center, 1st AF, ConAC; joint use with Nayv; named for Admiral Richard E. Byrd's pilot on first flight over North Pole, 1926. Housing: officers, fair; airmen, fair.

NIAGARA FALLS MUNICIPAL AP, N. Y., 4 mi. E of Niagara Falls. Fighter-interceptor base, EADF, ADC; Reserve training, ConAC; named for city. Housing: officers, fair; airmen, fair.

NORTON AFB, Calif., 5 mi. ENE of San Bernardino. Hq., Air Materiel Area, AMC; air division Hq., WADF, ADC; formerly San Bernardino Air Depot, renamed for Capt. Leland F. Norton, bomber pilot, killed in aircraft accident near Amiens, France, May 1944. Housing: officers, excellent; airmen, excel-

OFFUTT AFB, Neb., 9 mi. S of Omaha. Hq., SAC; named for 1st Lt. Jarvis Jennes Offutt, killed in fighter action, France, 1918. Housing: officers, fair; airmen, fair.

O'HARE INTERNAT'L AP, Ill., 15 mi. NW of Chicago. Fighterinterceptor base, EADF, ADC; Reserve training; formerly Douglas Airport; renamed for Lt. Cmdr. Edward H. O'Hare of Chicago, Navy pilot in WW II, winner of CMH, killed in action near Tarawa in the Pacific, 1943. Housing: officers, fair;

OLMSTED AFB, Penna., 1 mi. NW of Middletown. Hq., Air Materiel Area, AMC; formerly Middletown Air Depot; renamed for Lt. Robert S. Olmsted, balloon pilot, killed when his balloon was struck by lightning over Belgium, September 1923. Housing: officers, fair; airmen, fair.

ORLANDO AFB, Fla., 2 mi. E of Orlando. Hq., Air Photographic and Charting Service; Hq., Air Rescue Service; Hq., Flight Service, MATS; named for city. Housing: officers, excellent; airmen, excellent.

OTIS AFB, Mass., 9 mi. NNE of Falmouth. Fighter-interceptor base, EADF, ADC; named for Lt. Frank J. Otis, killed in air crash in US, 1937. Housing: officers, fair; airmen, fair.

OXNARD AFB, Oxnard, Calif. Fighter-interceptor base, WADF, ADC; named for city. Housing: officers, fair; airmen, fair.

PAINE AFB, Wash., 6 mi. S of Everett. Fighter-interceptor base, WADF, ADC; named for 2d Lt. Topliff O. Paine, air mail pilot, killed in US while mapping air mail routes, 1922. Housing: officers, good; airmen, good.

PALM BEACH AFB, Fla., 2 mi. W of West Palm Beach. Transport base, MATS; formerly Morrison Field; renamed for

city. Housing: officers, excellent; airmen, excellent.
PARKS AFB, Calif., Pleasanton, 28 mi. E of Oakland. Basic indoctrination center, Hq., Air Base Defense School, TTAF, ATC; overseas replacement depot; formerly Camp Shoemaker (Navy); renamed for Adm. Charles W. Parks, naval engineer. Housing: officers, good; airmen, fair.

PATRICK AFB, Fla., 12 mi. SE of Cocoa. Hq., AF Missile Test Center, ARDC; formerly Banana River NAS; renamed for Maj. Gen. Mason M. Patrick, Chief of Army Air Service during and after WW I, died in US, January 1942. Housing: officers, good;

airmen, fair.

PERRIN AFB, Tex., 6 mi. NNW of Sherman. Fighter-interceptor training, CTAF, ATC; named for Lt. Col. Elmer D. Perrin of Boerne, Tex., killed testing a B-26 near Baltimore, June 1941. Housing: officers, good; airmen, good.

PETERSON FIELD, Colo., 6 mi. E of Colorado Springs. Administrative flying, ADC; named for 1st Lt. Edward J. Peterson, killed in US, in airplane crash, 1942. Housing: offi-

cers, fair; airmen, fair.

PINECASTLE AFB, Fla., 7 mi. S of Orlando. Medium bomber base, 2d AF, SAC; named for nearby city. Housing: officers, good; airmen, fair.

PLATTSBURG AFB, N. Y., 1 mi. NE of Plattsburg. Medium bomber base, 8th AF, SAC; named for city. Housing: officers,

poor; airmen, poor.

POPE AFB, Fort Bragg, N. C., 12 mi. NW of Fayetteville. Troop carrier base, 18th AF, TAC; named for 1st Lt. Harley H. Pope, killed while making a forced landing in a Jenny in South Carolina, January 1919. Housing: officers, good; airmen, good. PORTLAND INTERNAT'L AP, Ore., 5 mi. NNE of Portland. Fighter-interceptor base, WADF, ADC; troop carrier base, 4th AF, ConAC; named for city. Housing: officers, excellent; air-

PORTSMOUTH AFB, N. H., 3 mi. W of Portsmouth. Medium bomber base, SAC; named for city. Housing: officers, good;

airmen, good.

PRESQUE ISLE AFB, Me., 1 mi. NW of Presque Isle. Fighterinterceptor base, EADF, ADC; named for city. Housing: officers, fair; airmen, fair.

RANDOLPH AFB, Tex., 15 mi. ENE of San Antonio. Transport pilot training, light bomber training, CTAF, ATC; Hq., School of Aviation Medicine, USAF (AU); named for Capt. William M. Randolph of Austin, fighter pilot, killed in aircraft accident in Texas, 1928. Housing: officers, excellent; airmen, excellent.

REESE AFB, Tex., 12 mi. W of Lubbock. Multi-engine pilot training, FTAF, ATC; formerly Lubbock AFB; renamed for Lt. Augustus F. Reese, Jr., of Shallowater, Tex., killed on bomber mission over Cagliari, Italy, May 1943. Housing: officers, excellent; airmen, excellent.

ROBINS AFB, Ga., 14 mi. SSE of Macon. Hq., Air Materiel Area, AMC; Hq., 14th AF, ConAC; named for Brig. Gen. Augustine Warner Robins, Chief, Materiel Division, Air Corps, who devised system of cataloging in 1920s, still used; died in 1940. Housing: officers, fair; airmen, fair.

(Continued on page 184)

MAJOR ACTIVE AIR FORCE BASES IN THE SOUTHERN US

The shaded area of the inset (left) is blown-up (below) to show locations of AF bases in the southern US from Florida to Arizona. The heavy concentration of bases results largely from



SAMPSON AFB, N. Y., near Geneva. Former Navy base named for Rear Adm. William T. Sampson, Atlantic Fleet commander in Spanish-American War, died in 1902. Housing: officers, good, airmen, fair.

SCOTT AFB, Ill., 6 mi. ENE of Belleville. Hq., ATC; personnel and communications schools, TTAF; fighter-interceptor base, CADF, ADC; named for Cpl. Frank S. Scott, first enlisted man to die in an air accident, killed at College Park, Md., 1912. Housing: officers, excellent; airmen, excellent.

SELFRIDGE AFB, Mich., 3 mi. E of Mount Clemens. Fighter-interceptor base, EADF, ADC; Hq., 10th AF, ConAC; named for Lt. Thomas E. Selfridge, killed in 1908 demonstrating Wright Brothers' plane for government. Housing: officers, excellent; airmen, good.

SEWART AFB, Tenn., 3 mi. N of Smyrna. Troop carrier base, 18th AF, TAC; formerly Smyrna AAB; renamed for Maj. Allan J. Sewart, Jr., bomber pilot, recipient of DSC, killed in action over the Solomons, November 1942. Housing: officers, fair; airmen fair

SEYMOUR-JOHNSON AFB, N. C., 2 mi. SSE of Goldsboro. Day-fighter base, 9th AF, TAC; fighter-interceptor base, EADF, ADC; named for Lt. Seymour A. Johnson, Navy pilot of Goldsboro, killed in 1942. Housing: officers, poor; airmen, poor.

SHAW AFB, S. C., 7 mi. WNW of Sumter. Hq., 9th AF, TAC; tactical recon; named for 1st Lt. Erwin D. Shaw of Sumter, killed during recon flight over German lines, July 1918, while serving with Royal Flying Corps. Housing: officers, fair; airmen, fair.

SHEPPARD AFB, Tex., 6 mi. N of Wichita Falls. Aircraft maintenance school, TTAF, ATC; named for Morris E. Sheppard, US Senator from Texas, chm. Senate Military Affairs Committee, who died in 1941. Housing: officers, good; airmen, good. SIOUX CITY MUNICIPAL AP, Iowa, 10 mi. S. of Sioux City. Fighter-interceptor base, CADF, ADC; named for city. Housing: officers, fair; airmen, fair.

SMOKY HILL, AFB, Kan., 4 mi. SW of Salina. Medium bomber base, 8th AF, SAC; named for geographical area. Housing: officers, fair; airmen, fair.

SPENCE AB, Ga., 5 mi. SE of Moultrie. Primary contract pilot training, FTAF, ATC; named for Lt. Thomas L. Spence of Thomasville, Ga., WW I pilot, killed in aircraft accident at end of war. Housing: officers, fair; airmen, fair.

STALLINGS AB, N. C., 5 mi. NW of Kinston. Primary contract pilot training, FTAF, ATC; formerly Kinston-Lenoir Co. Airport; renamed for Lt. Harry F. Stallings, Jr., B-29 navigator, killed in action in Pacific, April 1945; and his brother, Lt. June Bruce Stallings, P-51 pilot, killed over Germany, March 1945. Housing: officers, fair; airmen, fair.

Housing: officers, fair; airmen, fair. STEAD AFB, Nev., 10 mi. NW of Reno. Survival training, CTAF, ATC; named locally. Housing: officers, fair; airmen, fair.

STEWART AFB, N. Y., 4 mi. NW of Newburgh. Hq., EADF, ADC; fighter-interceptor base; named for Lachlan Stewart, sea captain whose father provided the original land for the base. Housing: officers, fair: airmen, fair.

Housing: officers, fair; airmen, fair.

SUFFOLK CO. AFB, N. Y., 3 mi. N of Westhampton Beach,
L. I. Fighter-interceptor base, EADF, ADC; named for geographical area. Housing: officers, fair; airmen, fair.

TINKER AFB, Okla., 8 mi. ESE of Oklahoma City. Hq., Air Materiel Area, AMC; air division hq., CADF, ADC; named for Maj. Gen. Clarence L. Tinker, a Pawhuska Indian, bomber and fighter pilot, CG, 7th AF, killed in Battle of Midway, June 1942. Housing: officers, good; airmen, good.

1942. Housing: officers, good; airmen, good. TOPEKA AF STATION, Kan., 7 mi. S of Topeka. Specialized depot, AMC; named for city. Housing: officers, fair; airmen,

TRAVIS AFB, Calif., 6 mi. ENE of Fairfield and Suisun. Heavy strategic recon bomber base, 15th AF, SAC; foreign clearing station, MATS; fighter-interceptor base, WADF, ADC; formerly Fairfield-Suisun AFB; renamed for Brig. Gen. Robert F. Travis, bomber pilot, recipient of DSC, killed in B-29 crash in US, August 1950. Housing: officers, good; airmen, good.

TRUAX FIELD, Wis., 1 mi. E of Madison. Fighter-interceptor base, CADF, ADC; named for 1st Lt. Thomas L. Truax of

Madison, pilot, killed in training flight in US, November 1941. Housing: officers, fair; airmen, fair.

TURNER AFB, Ga., 4 mi. ENE of Albany. Strategic fighter base; 2d AF, SAC; named for Lt. Sullins Preston Turner of Oxford, Ga., killed in aircraft accident at Langley AFB, May 1940. Housing: officers, poor; airmen, poor.

TYNDALL AFB, Fla., 8 mi. SE of Panama City. Aircraft control and fighter-interceptor training, CTAF, ATC; air police school; named for Lt. Frank B. Tyndall of Pt. Seward, Fla., WW I fighter pilot, killed in air crash, 1930, first Florida military flyer to be killed. Housing: officers, poor; airmen, poor.

VANCE AFB, Okla., 4 mi. SSW of Enid. Basic multi-engine pilot training, FTAF, ATC; formerly Enid AAB; renamed for Lt. Col. Leon R. Vance, Jr., WW II winner of CMH, lost in hospital aircraft when forced down at sea off Iceland, 1944. Housing: officers, good; airmen, good.

VINCENT AFB, Ariz., 7 mi. SE of Yuma. Weapons training center, ADC; formerly Yuma County Municipal AP, renamed (effective September 1, 1956) for Brig. Gen. Clinton D. Vincent who died of a heart attack on July 5, 1955. Housing: officers, excellent; airmen, good.

WALKER AFB, N. Mex., 6 mi. S of Roswell. Medium and heavy bomber base, 15th AF, SAC; formerly Roswell AAB; renamed for Brig. Gen. Kenneth N. Walker, a native of New Mexico, CG, 5th Bomber Command, WW II winner of CMH, killed in Southwest Pacific while leading a bombing attack, 1943. Housing: officers, good; airmen, fair.

WEBB AFB, Tex., 1.8 mi. SW of Big Spring. Basic singleengine pilot training, FTAF, ATC; formerly Big Spring AFB; renamed for 1st Lt. James L. Webb, Jr., F-51 pilot, killed off Japanese coast, 1949. Housing: officers, fair; airmen, fair.

WENDOVER AFB, Utah, 1 mi. S of Wendover. Gunnery range, 9th AF, TAC; named for city. Housing: officers, poor; airmen, poor.

WESTOVER AFB, Mass., 3 mi. NNE of Chicopee Falls. Hq., 8th AF, SAC; air refueling base; fighter-interceptor base, EADF, ADC; named for Maj. Gen. Oscar Westover, Chief of Air Corps, killed in air crash near Burbank, Calif., September 1938. Housing: officers, excellent; airmen, good.

WHITEMAN AFB, Mo., 3 mi. S of Knobnoster. Medium bomber base, 8th AF, SAC; formerly Sedalia AFB, renamed for 2d Lt. George A. Whiteman of Sedalia, killed in action at Pearl Harbor on December 7, 1941. Housing: officers, fair; airmen, fair.

WILKINS AF STATION, Ohio, 1 mi. N of Shelby. AF Specialized depot, AMC; named for Maj. Raymond H. Wilkins, CMH winner, killed November 2, 1943, over Rabaul, New Britain, after destroying two enemy ships. Housing: officers, fair; airmen, none.

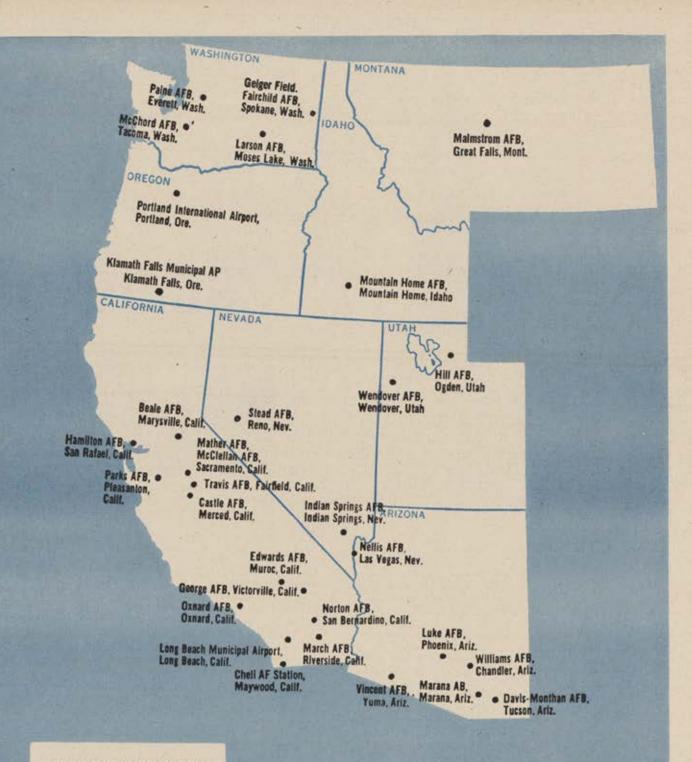
WILLIAMS AFB, Ariz., 10 mi. E of Chandler. Crew training for fighter bomber pilots, CTAF, ATC; jet pilot training; formerly Higley Field, renamed for Lt. Charles L. Williams, native of Arizona, bomber pilot, killed in Hawaii, July 1927. Housing: officers, poor; airmen, poor.

Housing: officers, poor; airmen, poor.
WILLOW RUN AP, Mich., 22 mi. WSW of Detroit. Reserve training, 10th AF, ConAC; named for aircraft plant located there in World War II. Housing: officers, fair; airmen, fair.

WRIGHT-PATTERSON AFB, Ohio, 2 mi. ENE of Dayton. Hq., AMC; WADC, ARDC; Air Force Institute of Technology (AU); fighter-interceptor base, EADF, ADC; formerly separate areas including Fairfield Air Depot, Wilbur Wright Field, McCook Field, and Patterson Field; named for Orville and Wilbur Wright, and Lt. Frank S. Patterson, killed in air crash near this base during early tests of synchronized machine-gun firing, June 1918. Housing: officers, good; airmen, good. WURTSMITH AFB, Mich., 3 mi. NW of Oscoda. Fighter-

WURTSMITH AFB, Mich., 3 mi. NW of Oscoda. Fighterinterceptor base. EADF, ADC; formerly Camp Skeel, later Oscoda AFB; renamed for Maj. Gen. Paul B. Wurtsmith, CG, 13th AF, killed in B-25 crash in North Carolina, 1946. Housing: officers, good; airmen, good.

YOUNGSTOWN MUNICIPAL AP, Ohio, 10 mi. N of Youngstown. Fighter-interceptor base, EADF, ADC; named for city. Housing: officers, fair, airmen, fair.—END



MAJOR ACTIVE AIR FORCE BASES IN THE WESTERN US

The shaded portion of the inset, right, is blown-up, above, showing location of AF bases in the western states. As is the case with each of the other sections (Northeast, page 179; Midwest, page 181; and South, page 183), the boundaries are those of one of ConAC's four AFs (Fourth AF here), only because it was the most convenient way to divide the country into four sections.



Big Ben in London.

If you're sent to England, chances are you'll have trouble finding family housing. Plumbing and heating aren't up to US standards.



AIR FORCE Magazine

GUIDE TO



Piccadilly Circus in London. There's no government housing in the city, but private housing is fairly available.



Government-owned trailers outside an air base in France, USAFE has found that trailers are an economical way of getting around housing shortage.

Alaska

EIELSON AFB, 17.5 mi. SE of Fairbanks. Named for Capt. Carl B. Eielson, pioneer of Alaskan aviation who flew over the North Pole with Sir Hubert Wilkins in 1928; flew first US air mail in Alaska, and was killed in a crash while trying to aid an iced-in vessel in the Bering Sea. Delay for government housing: Field grade-6 weeks; Company grade-32 weeks; NCOs-48 weeks. Private housing in Fairbanks: availability short during construction season (April through October); availability fair the rest of the year. Apartments and single-unit houses available. Most units unfurnished but equipped with cookstove and refrigerator. Unfurnished rentals are \$140 and up for 2 bedrooms, \$165 and up for 3 bedrooms, plus utilities. Utilities \$25 but can go as high as \$65 when tenant furnishes heat. Utility deposit of \$50 normally required. Furnished unit runs about \$25 more. Commuting from Eielson to Fairbanks hazardous during winter months due to adverse driving conditions. Commercial bus service available at \$6.50 per week.

ELMENDORF AFB, 4 mi. NE of Anchorage. Hq., Alaskan Air Command; named for Capt. Hugh M. Elmendorf who was killed in 1933 during test flight of a P-25. Delay for government housing: Field grade—32 weeks; Company grade—46 weeks; NCOs—64 weeks. Private housing: availability limited in construction season. Shortage of 3-bedroom units. Unfurnished 2-bedroom housing rents for about \$145 plus an average of \$20 for utilities. Apartments are generally heated, but add \$35 a month for heating of houses. Rental leases are usually for 1 year with 2 months' advance rent required and utility deposit of \$30. Housing located within 10-mile radius of base.

LADD AFB, 3.5 mi. E of Fairbanks. Named for Maj. Arthur K. Ladd who was assistant G-4 at general headquarters Air Force, Langley Field, Va., where he died in 1935. Delay for government housing: Field grade—13 weeks; Company grade—

42 weeks; NCOs-52 weeks; 2 weeks' delay for private housing. (See Eielson AFB, above.)

Azores

LAJES FIELD, on Terceira Island. MATS base. Delay in obtaining government housing: Field grade—48 weeks; Company grade—28 weeks; NCOs—72 weeks. Private housing: availability fair to good; most housing is unfurnished and not up to US standards. Rents range from \$25 up and tenant should have from \$350 to \$750 to render such housing habitable. In some instances, housing can be built—\$500 to \$1,000 is normally required to start construction on land which is on or adjacent to the base. Dwellings can be purchased from rotating personnel at from \$1,800 to \$3.500. All such dwellings use base facilities such as water, electricity, and sewage system.

Bermuda

KINDLEY AFB, 2 mi. S of St. George. Named for Capt. Field E. Kindley, outstanding WW I pilot, killed in an air crash at Kelly Field, San Antonio, Tex., in 1920. Delay for government housing: Field grade—52 weeks; Company grade—78 weeks; NCOs—104 weeks. Private housing: availability poor, majority of units are furnished and rent for \$77 and up for 1 bedroom, \$95 and up for 2 bedrooms, \$110 and up for 3 bedrooms, and \$132 and up for 4 bedrooms; all plus about \$20 for utilities. One month's rent required in advance plus deposit of about \$25 for breakage and damage. Leases usually on a month-to-month basis, Principal should have at least \$500 on hand to defray costs of advance rental and initial housekeeping incidentals. Housing located within 10 miles of base with commercial transportation available.

France

BORDEAUX AB, 6 mi. W of Bordeaux. No government hous-

Street scene in Paris.
Although there's no
government housing, you
shouldn't have too
much trouble finding
private housing.



HOUSING OVERSEAS

- ▶ How much it costs
- ▶ Where you will live
- ▶ How long you must wait



German school boys visit Rhein/Main Dependents School to see how American education stacks up. Housing is fairly good in Germany.

ing available. Private housing: availability fair, unfurnished units rent for approximately \$50, plus \$30 for utilities. Furnished units are higher depending upon standard of facilities and furnishings. Occasionally 3 months' rent required in advance plus deposit for possible damage to house or furnishings. Housing usually 5 to 30 miles from installation. Commercial transportation is poor.

CHAMBLEY AB, NE of Chambley. Delay for government housing: Field grade—24 weeks; Company grade—24 weeks; NCOs—52 weeks. Private housing: availability fair, units rent for \$70 to \$100 plus \$20 to \$30 for utilities. Some units share bath. Leases are usually for one year, 6 months' advance rent required in some cases. Deposit may be required on furnishings, electricity, and gas. Housing usually 15 to 20 miles from base. Commercial transportation not available.

CHATEAUROUX-DEOLS AP, 3 mi. NNE of Chateauroux. More than 20 weeks' delay for all grades of government housing. Private housing: availability poor, unfurnished units rent for \$60 to \$140 a month plus utilities averaging \$15. Furnished units \$90 to \$150 plus utilities. Leases are usually for one or more years, one month's rent required in advance. Deposits required on electricity and gas. Housing from 1 to 30 miles from base, commercial transportation available.

CHAUMONT AB, SE of Montsaon. No delay for government housing (government-owned trailers). Private housing: 6 weeks' delay, average rents range from \$50 to \$150 plus utilities. Leases required and must be approved by base legal officer before being accepted. Nearly all housing requires improvements such as installation of plumbing and bathroom with costs usually borne by tenants. Housing from 7 to 35 miles from base with no commercial transportation from outlying towns.

DREUX AB, at Dreux. Delay for government housing: officers -25 weeks; NCOs-50 weeks. Private housing: availability poor; unfurnished units rent for about \$80 including utilities. Furnishings in furnished units not up to US standards. Housing is from 9 to 20 miles from base; no commercial transportation.

EVREUX. Delay for government housing (government-owned trailers): more than 20 weeks for all grades. Private housing: availability poor; most housing furnished, but inadequately. Average rent is \$90 plus \$70 for utilities. Leases are usually for 1 year with up to 2 months' rent required in advance. Bathroom facilities limited and in most cases must be shared with other tenants. Housing about 25 miles from base.

ETAIN. Delay for government housing (government-owned trailers): 52 weeks for all grades. Private housing: availability poor to fair; unfurnished units rent for \$60 to \$125 depending upon standard of facilities and services furnished. Most are small 3- or 4-room apartments without adequate bath or inside plumbing. Leases are usually for 6 months or 1 year with 1 month's advance rent required. Housing usually 12 to 15 miles from installation; limited commercial transportation available.

FONTAINEBLEAU, at Fontainebleau. No government housing. Private housing: availability is fair to good except May-September; unfurnished units average \$105 plus \$84 for utilities. Leases usually on annual or semi-annual basis with one month's advance rent required. Deposits required on house, furnishings, equipment, gas, and electricity. Housing within 15 miles of base; commercial transportation inadequate.

(NOTE: A government-housing facility—Fontainebleau Village—provides limited accommodations for personnel assigned to joint staffs. Delay in assignment varies from 12 to 32 weeks.)

(Continued on page 189)

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LAON. Delay for government housing (government-owned trailers); 60 weeks for all grades. Private housing: difficult to find; usually inadequate and far below US standards. Rentals vary from \$35 for 1 room to \$75 for 4 rooms. Housing within a 40-mile radius of base; commercial transportation expensive and inadequate.

ORLY FIELD, 9 mi. SSE of Paris. No government housing. Private housing: no delay; furnished units average \$100 to \$200 plus utilities of \$30 to \$50. Bathroom facilities below US standards. Leases are rare, advance rent of from 1 to 6 months usually required. Housing is usually within 8 miles of base; commercial transportation available at reasonable rates.

PARIS. No government housing. (Rental guarantee project in Paris area provides housing for personnel assigned to Hq., European Command, only. Units include 2- and 3-bedroom units, unfurnished except for cookstove and refrigerator. Rents range from \$122.50 to \$142.50 including utilities. Units not always available for occupancy.) Private housing: no delay. (Same as for Orly Field, above.)

PHALSBOURG. Delay for government housing (government-owned trailers): officers—no delay; NCOs—4 weeks. Private housing: availability fair to good; most units unfurnished and rent for \$65 to \$85 plus \$50 for utilities. Few include bathroom facilities and such facilities must be installed at expense of tenant. Leases are required and deposits and/or insurance on furnishings and appliances are necessary. Housing is within 25 miles of base, however, best housing is in city of Strasbourg—about 40 miles from base.

TOUL-ROSIERE AB, 8.5 mi. NE of Croix de Metz. No government housing. Private housing: availability fair to poor; unfurnished units rent for about \$70 plus utilities. Furnished units average \$100; utilities average \$45. About half the units have private bathroom facilities, balance are shared or not available. Leases are usually for 1 year or more and 1 month's advance rent usually required. Deposits often required on furniture and deposits of \$15 each for gas and electricity are required by utility companies. Housing located 25 to 45 miles from base; commercial transportation not available.

French Morocco

BEN GUERIR AB, 2 mi. SSE of Ben Guerir. Delay for government housing (government-owned trailers): 2 weeks' delay for all grades. Private housing: 2 weeks' delay; housing is in Marrakech, 40 miles from base, and is expensive and substandard. Rents range from \$100 for unfurnished 1-bedroom apartment to \$150 for furnished 1-bedroom house. Agent's fee, deposit and 3 months' rent often required in advance. Utilities are in addition to rent and average \$60 a month during summer; \$85 during winter. (Fifty 2-bedroom and fifty 3-bedroom private rental units are available on the base. All are equipped with refrigerators, ranges, and heaters and may be leased furnished or unfurnished.)

NOUASSEUR AB, 2 mi. ENE of Nouasseur. No delay for government housing—assigned to key personnel only. Private housing: 1 week's delay; unfurnished units rent for \$65 to \$200 plus \$30 for utilities. Furnished—\$85 to \$200. All units have private bath facilities. Leases usually for 6 months, 1 month's rent required in advance. Deposit may be required on furnishings; guarantee deposit on electricity, gas, and water required. Housing 20 to 30 miles from base; commercial transportation available.

RABAT-SALE (SALE) AB, 5 mi. ENE of Rabat. No government housing. Private housing: availability fair to good; unfurnished units rent for about \$75 plus \$35 for utilities. Furnished units are higher, depending on facilities and furnishings. Most units have bathroom facilities. Leases are usually for 1 year and up to 3 months' rent is usually required in advance. Deposits required on furniture, electricity, and taxes. Housing is from 1 to 3 miles from base; commercial and limited government transportation available.

SIDI SLIMANE AB, 6.5 mi. WSW of Sidi Slimane. Delay for government housing: Field grade—8 weeks; Company grade—16 weeks; M/Sgts.—8 weeks; T/Sgts., S/Sgts.—16 weeks. (Assigned to key personnel only.) Private housing: availability fair to good; most units are unfurnished and rent for about \$80 plus \$30 for utilities. Up to 3 months' advance rent and agent's fee required. Housing 9 to 35 miles from base; commercial transportation available.

Germany

(NOTE: Private housing in Germany authorized with the provision that government quarters will be accepted upon assignment. Private rentals will not be authorized when government quarters are available.)

BIRKENFELD. No delay for government housing. Private housing: availability poor to fair; unfurnished units rent for about \$35 plus \$15 for utilities. Most units must share bathroom facilities. Principal should have at least \$150 on hand for rendering housing habitable. Commercial transportation available.

BITBURG AB, 13.5 mi. SE of Trier. Delay for government housing: officers—12 weeks; NCOs—26 weeks. Private housing: 12 weeks' delay; hotel and pension-type accommodations varying from \$50 to \$150 including utilities.

BREMERHAVEN. Delay for government housing: officers—12 weeks; NCOs—20 weeks. Private housing: availability poor; apartments are usually part of an individual home and usually share bathroom facilities. Rent averages \$30 plus utilities. Housing available within 40 miles of installation rated as very poor.

DARMSTADT. Delay for government housing: all grades—12 weeks. Private housing: 6 weeks' delay; rents range from \$35 to \$75 plus \$15 for utilities. Most units share bath. Leases for period of 6 months, and principal should have at least \$250 on hand to defray costs of first month.

ERDING AB, 2 mi. NE of Erding. Delay for government housing: all grades-28 weeks. Private housing: 4 weeks' delay.

FRANKFURT. Delay for government housing: all grades—24 weeks. Private housing: availability fair to good; unfurnished units rent for about \$40 including utilities. In some cases rent is required in advance, as are deposits on furniture. Principal should have at least \$350 on hand to render housing habitable. Housing located within a 10-mile radius of base; commercial transportation available.

FURSTENFELDBRUCK AB, 2 mi. NNE of Furstenfeldbruck. Delay for government housing: all grades—13 weeks. Private housing: houses inadequate and scarce; rents range from \$60 to \$120. May be necessary to share bath. Leases may be required, and 1 month's advance rent required. Housing also available in Munich, 20 miles away.

HAHN AB, 1 mi. S of Hahn. Delay for government housing: all grades-24 weeks. Private housing: availability poor; unfurnished units are about \$50 plus \$20 for utilities. Most units share bath. Principal should have at least \$250 on hand to render housing habitable. Housing available 15 to 45 miles from base; limited commercial transportation.

KAISERSLAUTERN. Delay for government housing: all grades -16 weeks. Private housing: 2 weeks' delay. (See Ramstein.)

KAUFBEUREN. Delay for government housing: all grades—13 weeks. Private housing—extremely scarce; one furnished room tents for \$20 to \$25.

KIESSELBRONN. No delay for government housing; private housing not authorized.

LANDSBERG AB, 2 mi. NE of Landsberg. Delay for govern-(Continued on following page) ment housing: all grades—13 weeks. Private housing: extremely scarce and sub-standard. Housing within 30 miles of base; limited commercial transportation.

LANDSTUHL AB, 1.5 mi. NE of Landstuhl. Delay for government housing: officers—16 weeks; NCOs—20 weeks. Private housing: 2 weeks' delay. (See Ramstein.)

LUDWIGSBERG. Delay for government housing: all grades— 12 weeks. Private housing: 8 weeks' delay; no rental information available.

NEUBIBERG AB, 5 mi. SSE of Munich. Delay for government housing: all grades—13 weeks. Private housing: availability poor; most units 1 or 2 rooms furnished, with kitchen and bathroom facilities. Average rent is \$70 to \$100 plus utilities averaging \$30 to \$60. \$35 to \$60 required for agent's fee. Leases may be required.

RAMSTEIN. Delay for government housing: officers—no delay; NCOs—26 weeks. Private housing: availability very limited; units below US standards and rent for \$65 to \$200 plus \$30 to \$60 for utilities. Principal should have at least \$200 on hand to defray initial cost of housing. Distance from base averages 10 miles.

RHEIN/MAIN. Delay for government housing: Field grade—30 weeks; Company grade—40 weeks; NCOs—50 weeks. Private housing is limited; furnished apartments or shared houses rent from \$100 to \$250 (this does not include dishes, linens, or refrigerator). Housing is 5 to 20 miles from base; commercial transportation available.

ROTHWESTEN. Delay for government housing: all grades—20 weeks, Private housing: availability fair; unfurnished housing rents for about \$60, usually share bathroom facilities. Leases are usually for 1 year with up to 6 months' rent required in advance. Principal should have at least \$500 on hand to render housing habitable. Housing 10 to 20 miles from base; no commercial transportation.

SCHONEFELD (PRUEM). Delay for government housing: all grades—12 weeks. Private housing: nonexistent except for hotel and pension-type accommodations which are not practical for family quarters. Rent varies from \$50 to \$150, which includes utilities.

SEMBACH. Delay for government housing: officers—4 weeks; NCOs—17 weeks. Private bousing: no delay; most units furnished with rents ranging from \$40 to \$100 plus \$20 for utilities. Deposits usually not required and rents not controlled by the government. Housing is within 10 miles of base.

SPANGDAHLEM AB, 8 mi. E of Spangdahlem. Delay for government housing: officers—16 weeks; NCOs—26 weeks. Private housing nonexistent except for hotel and pension-type which are not practical for family quarters. Cooking facilities are not normally provided and heating usually by coal-burning stoves in each room. Rent varies from \$50 to \$150 including utilities.

TEMPELHOF AB, at Berlin. Delay for government housing: officers—28 weeks; NCOs—72 weeks. No private housing authorized.

ULM. Delay for government housing: officers—no delay; NCOs—20 weeks. Private housing: availability fair; units rent from \$40 to \$60 plus \$4 for utilities. Length of leases optional; advance rental depends on contract. Limited housing available 10 miles from installation.

WIESBADEN AB, 4.3 mi. SE of Wiesbaden. Hq., USAFE; Hq., Air Materiel Force. Delay for government housing: all grades—28 weeks. Private housing practically nonexistent; when available, quarters are expensive and are usually below US standards.

Great Britain

England (NOTE: England is suffering an over-all housing shortage. Available housing is furnished in almost every instance and standard of furnishings is low. Central heating is rarely found in single units but often found in apartment-type housing. Rents are controlled by the British government. Large advance deposits are not normally required. ALL LEASES MUST BE EXAMINED BY BASE LEGAL OFFICER PRIOR TO SIGNING. Some leases require tenant to vacate or share dwelling with owner during summer months.)

ALCONBURY. No government housing. Private housing: availability poor; furnished 2-bedroom house rents for \$70 and 4 bedrooms for \$100 plus utilities averaging \$30 in winter and \$20 in summer. Leases are from 1 to 5 years. Housing located within 22 miles of installation; commercial transportation is very poor.

BENTWATERS AB, 4.5 mi. NE of Woodbridge. No government housing. Private housing: availability fair; furnished houses average: officers—\$80, NCOs—\$55, airmen—\$45 plus \$20 to \$25 for utilities. Housing located within 15 miles of base. This is a summer resort area and rents tend to increase during summer months.

BLYTON. No government housing. Private housing: availability poor; furnished rentals average: officers—\$100, NCOs—\$75, airmen—\$45 plus \$25 to \$40 for utilities. Principal should have on hand \$300 to defray initial cost of private housing. Housing normally located within 8 miles of base.

BOVINGDON AB, NE of Bovingdon. No government housing. Private housing: availability fair; average furnished rentals: officers—\$96, NCOs—\$77, airmen—\$57 plus \$34 to \$53 for utilities. Units do not normally contain refrigerators or adequate heating facilities. Principal should have at least \$300 on hand for initial costs. Housing located within 7 miles of base.

BRIZE NORTON AB, SW of Brize Norton, Government kousing for key personnel only. Private housing: availability poor; furnished houses average: officers—\$80, NCOs and airmen—\$68 plus \$34 to \$47 for utilities. Housing from 9 to 18 miles from base.

BURDEROP PARK. Government housing for key personnel only. Private housing: availability fair; furnished houses average \$56 plus \$38 for utilities. Principal should have at least \$250 on hand for initial costs. Housing located within 6 miles of base.

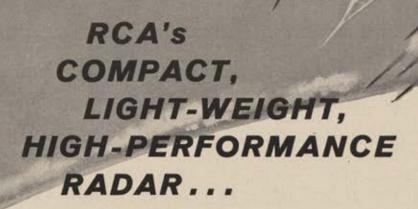
BURTONWOOD AB, S of Burtonwood. Delay for government housing: all grades—72 weeks. Private housing: difficult to obtain close to base; furnished houses average \$80 to \$100; unfurnished, \$50 to \$60 plus utilities. Units usually heated by coal fireplaces. Leases vary and are required in about half the cases. Housing fair to good beyond 15-mile radius, including Manchester and Liverpool. Commercial transportation is available.

BUSHY PARK, Middlesex. No government housing. Private housing: availability fair; furnished houses average: officers—\$118, NCOs—\$95, airmen—\$74 plus \$32 for heating. Most rentals require a large deposit and principal should have at least \$500 on hand for initial costs. Most housing within 7½ miles of base.

CHELVESTON. No government housing. Private housing: availability poor; furnished rentals: officers—\$85, NCOs—\$65, airmen—\$60 plus \$13 for utilities. Principal should have at least \$350 on hand for initial costs. Average distance from installation is 12 miles.

CHICKSANDS. No government housing. Private housing: availability good; weekly rent varies from \$10 to \$22, may have to share bath. Most units lack refrigerator and central heating. Principal should have at least \$250 on hand to render housing habitable. Commercial transportation is limited.

(Continued on page 193)

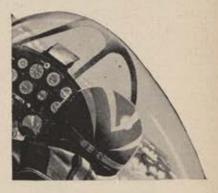


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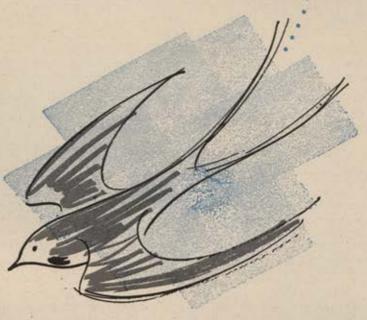
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COLLIERS END. No government housing. Private housing: availability fair; average rental: officers—\$80, NCOs and airmen—\$69 plus \$29 to \$48 for utilities. Should have at least \$200 on hand for initial costs. Housing located within 6 miles of base.

CROUGHTON. No government housing. Private housing: availability fair to good; furnished units average: officers—\$92, NCOs—\$62, airmen—\$51. Leases usually for 6 months with 1 month's advance rent required. Bond up to \$25 may be required against damages to furnishings. Housing 9 to 20 miles from base; no commercial transportation.

DENHAM. No government housing. No delay for private housing.

EAST KIRBY. No government housing. Private housing: availability is good; average furnished rental: 1-bedroom—\$40, 2-bedroom—\$54, 3-bedroom—\$58 plus \$26 for utilities. Unfurnished houses not available. This is a resort area and housing is critical from May to September. Most housing 17 miles from base; commercial transportation.

ELVINGTON. No government housing. Private housing: availability poor; furnished houses: officers—\$100, NCOs—\$75, airmen—\$45 plus \$25 to \$40 for utilities. Principal should have at least \$300 on hand for initial costs, Housing usually located within 10 miles of installation.

FAIRFORD AB, 1 mi. SSE of Fairford. No government housing. Private housing: availability poor; unfurnished houses rent for about \$75 plus \$25 for utilities. Leases are usually for 1 year with 1 month's advance rent required. Principal should have at least \$350 available to render housing habitable. Housing available within 30 miles of base; commercial transportation limited.

FULL SUTTON. No government housing. No delay for private housing.

GRANGE. No government housing. No delay for private housing.

GREENHAM COMMON AB, SE of Greenham Common. No government housing. Private housing extremely scarce.

HIGH WYCOMBE. No government housing. Private housing: availability poor; average cost for furnished houses: officers—\$125, NCOs and airmen—\$98 plus \$38 to \$56 for utilities. Unfurnished housing not available. Should have at least \$300 on hand to render housing habitable. Housing located within 10 miles of base.

HOMEWOOD. No government housing. Private housing: 3 weeks' delay.

LAKENHEATH AB, SE of Lakenheath. Delay for government housing: Field grade—14 weeks; Captains—20 weeks; other Company grade—78 weeks; M/Sgt.—26 weeks; other NCOs—78 weeks. Private housing: availability poor; average cost, furnished houses: officers—\$80, others—\$75 plus \$25 for utilities. Six-month lease required and principal should have at least \$600 on hand for initial costs. Housing within 13 miles of base.

LINDHOLME. No government housing. Private housing: poor availability; unfurnished housing—\$60 plus \$15 for utilities. Leases are usually for 1 year with 1 month's advance rent required. Should have at least \$300 on hand to render housing habitable. Housing usually available 10 to 15 miles from base; commercial transportation is limited.

LONDON. No government housing. Private housing: availability fair to good; furnished units range from \$75 to \$120 plus \$35 for utilities. Leases for 1 year usually required and up to 1 month's rent in advance. Should have at least \$400 to render housing habitable. Housing located 8 to 12 miles from base; commercial transportation available.

MANSTON AB, 2 mi. WNW of Ramsgate. Government housing available only for key personnel in the field grades. Private housing: availability extremely limited during summer months, better during winter. Furnished houses range from: officers—\$110, NCOs and airmen—\$70 plus \$20 to \$30 for utilities. Leases are usually for 1 year. Should have at least \$200 on hand for initial costs. Housing located within 10 miles of base; commercial transportation available but not always adequate.

MILDENHALL AB, 2 mi. NW of Mildenhall. Delay for government housing: Field grade—12 weeks; Captains—24 weeks; other Company grade—72 weeks; M/Sgts.—24 weeks; other NCOs—48 weeks. Private housing: availability poor; no central heating, poor plumbing. Furnished housing rents for about \$90 for officers, \$75 for NCOs and airmen plus \$25 for utilities. Should have \$400 on hand for initial costs. Housing located within 13 miles of installations.

MOLESWORTH. No government housing. Private housing: availability poor except for 1-bedroom units. Furnished housing rents for about \$70, unfurnished for \$65 plus \$25 monthly during winter and \$10 during summer for utilities. Leases are for 1 year with weekly rental payments required in advance. Housing located 10 to 25 miles from base; very limited commercial transportation.

NORTH PICKENHAM. No government housing. Private housing: availability fair to good; furnished housing averages \$65 plus \$25 for utilities. All housing has bathroom facilities, Rental leases not required, one month's rent usually required in advance. Should have at least \$400 on hand to render housing habitable. Housing located within 7 miles of base; no commercial transportation.

SCULTHORPE AB, W of Sculthorpe, Delay for government housing: Field grade—22 weeks; Company grade—36 weeks; NCOs—20 weeks, Private housing: availability limited; furnished houses average: officers—\$112, NCOs—\$78, airmen—\$70 plus \$20 to \$35 for utilities. Should have \$175 to \$275 on hand for initial expenses. Housing located within 19 miles of base.

SHAFTESBURY. No government housing. No delay for private housing. Average costs, furnished houses: officers—\$59, NCOs—\$53, airmen—\$50 plus \$27 to \$29 for utilities. All dwellings inadequately heated and small. Should have at least \$300 on hand for initial cost. Housing located within 5 miles of base.

SHELLINGFORD. No government housing. Private housing: availability poor. Furnished housing averages \$90, rental leases are usually for 1 or more years with 1 month's advance rent required. Should have at least \$300 on hand to render housing habitable. Housing usually located fairly close to base; military transportation available.

SHEPHERDS GROVE AB, 2 mi. E of Stanton. No government housing. Private housing: availability fair. Average costs for furnished units: officers—\$80, NCOs—\$75, airmen—\$60 plus from \$36 to \$48 for utilities. Housing usually located within 14 miles from installation; very limited commercial transportation.

SOUTH RUISLIP AB, at South Ruislip. No government housing. Private housing: availability poor; average costs for furnished houses: officers—\$130, NCOs—\$107, airmen—\$95 plus \$35 to \$60 for utilities. Should have at least \$500 on hand for initial costs. Housing located within 7 miles of base.

STANSTEAD. No government housing. Private housing: availability and standard is fair. Average costs for furnished house or apartment is \$16.80 a week, all rent payable on a weekly basis. Utilities average \$30 monthly. Should have at least \$300 on hand for initial costs. Housing varies from 1 to 20 miles from base; commercial transportation is inadequate.

STURGATE. No government housing. Private housing: availability poor. Unfurnished units rent for about \$75 plus \$31 for (Continued on following page)

utilities. Furnished from \$60 plus utilities. Most units share bathroom, some share kitchen. Should have at least \$250 for husband and wife and \$45 for each additional dependent for initial costs.

TUDDENHAM. No government housing. Private housing: see North Pickenham.

UPPER HEYFORD AB, at Upper Heyford. Delay for government housing: officers-64 weeks; NCOs-52 weeks. Private housing: availability poor; critically short for personnel with children. Average costs, furnished houses: officers-\$100, NCOs and airmen-\$90 plus \$25 for utilities. Should have at least \$500 for initial costs. Housing located within 15 miles of base.

WEST DRAYTON. No government housing. Private housing: availability fair; average cost for furnished houses: officers—\$130. NCOs—\$100. airmen—\$90 plus \$30 to \$50 for utilities. Rental leases usually for 1 or more years. Should have at least \$500 on hand for initial expenses. Housing located within 10 miles of base; commercial transportation available.

WETHERSFIELD. No government housing. Private housing: availability fair for officers and NCOs, poor for airmen. Average costs, furnished houses: officers—\$98, NCOs—\$68, airmen—\$60 plus \$19 to \$42 for utilities. Leases are not always required; should have at least \$300 on hand for initial costs. Housing usually within 11 miles of base.

WIMPOLE PARK, at Wimpole Park. USAF hospital. Delay for government housing: officers—86 weeks; NCOs—132 weeks. Private housing: availability fair; average cost of furnished houses: officers—\$84, NCOs—\$65, airmen—\$57 plus \$30 to \$45 for utilities. Should have at least \$200 on hand for initial expenses. Housing normally within 14 miles of base.

WOODBRIDGE. No government housing. Private housing: availability poor. Average cost for furnished houses: officers—\$60 to \$80, NCOs—\$60, airmen—\$45 plus \$27 to \$45 for utilities. Should have at least \$300 on hand for initial expenses. Housing located within 14 miles of base. Housing area on base is private enterprise, trailers and pre-fab units. Trailers rent for \$57 plus \$22 for utilities. Delay in obtaining—1 week. Pre-fabs rent for \$73 plus \$17 for utilities. Delay—16 weeks.

YORK. No government housing. Private housing: availability poor; average cost, furnished houses: officers—\$125, NCOs—\$95, airmen—\$80 plus \$35 to \$50 for utilities. Should have at least \$200 on hand for initial costs. Housing normally within 13 miles of base; no commercial transportation except taxis.

Scotland

KIRKNEWTON. No government housing. Private housing: availability fair to good, except during tourist season. June through September. Unfurnished units not available, furnished units average \$60 plus \$20 for utilities. One month's rent usually required in advance. Units normally 15 to 20 miles from base; commercial transportation available.

PRESTWICK. No government housing. Private housing: availability is poor during summer months, fair rest of the year. All housing furnished. Rents range from \$70 to \$90 plus \$65 for utilities. One month's rent usually required in advance.

Wales

SEALAND. Delay for government housing: Field grade—36 weeks; Company grade—84 weeks; NCOs—124 weeks. Private housing: availability fair to good. All units furnished and rent for about \$40 to \$100 plus \$20 for utilities. Some must share bath. Leases usually for 1 or more years with 1 month's advance rent required. Deposits required on furnishings, electricity, and gas. Housing usually 10 to 20 miles from base; adequate commercial transportation available.

Greece

ATHENS. No government housing. Private housing: avail-

ability fair, October to April; poor May to September. Rent for furnished housing is \$125 to \$200, including utilities. Leases are for 6 or 12 months with 2 months' advance rent required. Bare minimum of furnishings—usually a stove, but rarely a refrigerator. Electrical service is 220 volts, 50 cycles, two wire. Only bottled gas is available. Only a small percentage of houses have central heat and during winter supplementary heaters, preferably oil, are necessary. Housing usually 7 miles from base; commercial transportation readily available.

Greenland

NARSARSSUAK AB, 1 mi. N of Narsarssuak. Delay for government housing: all grades—24 weeks. No private housing.

SONDRESTROM AB, 7.5 mi. NE of Sondrestromfjord. Dependent travel not authorized.

THULE AB, 2.5 mi. SE of Thule. Dependent travel not authororized.

Guam

ANDERSEN AFB, N Guam Island. Named for Brig. Gen. James R. Andersen, Chief of Staff to Lt. Gen. Millard F. Harmon at Hq., AAFPOA in WW II. General Andersen's plane was lost off Kwajalein in 1945. Delay for government housing: officers—24 weeks; NCOs—30 weeks. Private housing: availability fair to good. Unfurnished units rent for about \$95 to \$105 plus \$30 for utilities. Leases usually for 1 year with 1 month's rent required in advance. A limited number of newly constructed houses may be leased for 2 years at \$125 a month. Should have at least \$250 on hand for initial costs. Housing usually 15 to 20 miles from base; commercial transportation available but very expensive.

Hawaii

HICKAM AFB, at NW Oahu. Named for outstanding aviator Lt. Col. Horace M. Hickam, commander Third Attack Group, killed in air crash, Fort Crockett, Tex., in 1934. Delay for government housing: Colonels and above—no delay; Lt. Col.—6 weeks; Majors with date of rank prior to 15 February 1951—12 weeks; Company grade—1-bedroom quarters, 12 weeks. Other quarters not available except for WO4 with date of rank prior to 15 February 1951 (12-week delay); M/Sgts.—12 weeks; T/Sgts. with date of rank prior to 1 January 1951—16 weeks; others—not available. Private housing: availability is limited, standards adequate. Unfurnished, 1-bedroom—\$70 to \$95; furnished—\$90 to \$125 to \$160. Three-bedroom, unfurnished—\$100 to \$125; furnished—\$125 to \$160. Three-bedroom, unfurnished—\$125 to \$175; furnished—\$150 to \$225. Utilities, averaging \$23 for a family of four, are in addition. Rents payable in advance and security deposit required.

Iceland

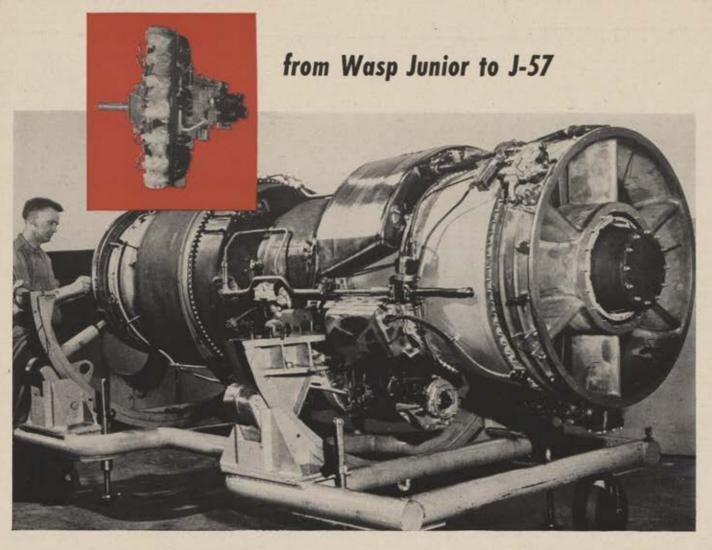
KEFLAVIK AP. Delay for government housing: all grades-15 weeks (assigned to key personnel only). No private housing.

Italy

AVIANO. No government housing. Private housing: availability good to excellent throughout the year. Both furnished and unfurnished housing rents for about \$60 plus \$25 for utilities. Rentals are usually for 1 year with 1 month's advance rent required. Most housing within 10 miles of installation.

NAPLES. No government housing. Private housing: availability good throughout the year. Furnished and unfurnished units range from \$65 to \$192 plus \$30 for utilities. (Cost of utilities does not include heating.) Leases are for 6 months or 1 to 2 years with renewal options and a 1 month's deposit and 1 month's advance rental are standard. A military clause allows cancellation of the contract on 15 days' notice upon receipt of military orders calling for transfer away from Naples.

ROME. No government housing. Private housing: availability fair to good. Furnished and unfurnished units available. Unfurnished ranges from \$75 to \$85 plus \$25 for utilities. Leases (Continued on page 197)

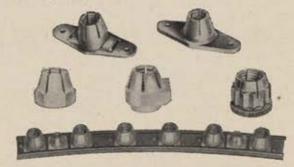


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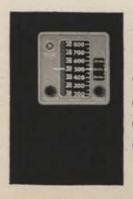
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are for 1 year with 1 month's rent in advance required. Housing is usually 10 to 15 miles from installation; no commercial transportation available.

UDINE. No government housing. Private housing: availability fair to good. Most units unfurnished and rent for \$40 for 2-bedroom houses; \$56 for 3-bedroom; \$80 for 4 or more bedrooms. Furnished units rent for about 50 percent more. Utilities cost about \$28 and heat during winter averages \$20 per month. All units have hot water except lower priced units do not have hot water in the kitchen. Leases are for 1 year with a 60-day cancellation clause. One month's rent in advance is required and deposits on utilities amount to about \$16. Housing is within 10 miles of installation.

Japan

ASHIYA AB, SSW of Ashiya. Delay for government housing: all grades—52 weeks. Private housing: availability limited; housing at Ashiya-Machi is within walking distance of base. Housing in Kokura is about 20 miles away and transportation is furnished. Only unfurnished units available and such items as refrigerator, hot water heater, cooking stove, and heaters must be furnished by tenant. Rent averages \$60 plus \$20 for electricity and \$20 for fuel oil. No advance rent required, but newly arrived families should have at least \$200 to render housing habitable.

CHITOSE AB, 1 mi. SE of Chitose. Delay for government housing: all grades—36 weeks. Private housing: availability limited; rents range from \$35 to \$80 plus \$40 for utilities. Most rentals barely meet the minimum standard of requirements. Winters are extremely cold.

HAMAMATSU. No government housing. Private housing: availability limited; all units unfurnished and rent for about \$70 plus \$35 for utilities. Four months' advance rent usually required and principal should have at least \$500 on hand to start household. Housing about 5 miles from place of duty; commercial transportation inadequate, taxi service available but expensive.

ITAMI AB, 10 mi. NNW of Osaka. Delay for government housing: all grades—40 weeks. Private housing: availability limited; majority of rentals in Osaka 10 miles from base, or Kobe, 14 miles from base. Almost all units are unfurnished and average \$90 plus 20 to 50 percent of rental, depending on season, for utilities. Most units are Japanese style with no central heating. Commercial transportation available.

ITAZUKE AB, 1 mi. N of Fukuoka. Delay for government housing: all grades—84 weeks. Private housing: availability poor. Rent ranges from \$65 to \$75 plus \$20 for utilities; three months' rent required in advance. Housing usually within 4 miles of base; commercial transportation available.

JOHNSON AB, 1 mi. S of Irumagawa. Delay for government housing: all grades—68 weeks. Private housing: availability fair; majority are 2-bedroom, western or Japanese style, unfurnished units. Rent is about \$65 plus \$20 for utilities. Leases for 1 year usually required with 1 month's rent in advance. Some privately owned dwellings for sale at from \$1,500 to \$3,000. Distance from base varies from 1 to 25 miles; commercial transportation is poor.

KISARAZU. Delay for government housing: all grades—60 weeks. Private housing: availability is fair; units unfurnished Japanese style. Rent ranges from \$25 to \$75 plus \$30 to \$40 for utilities. One month's advance rent required. Housing 1 to 50 miles from base; commercial transportation available to most areas.

MIHO AB, at Miho. Delay for government housing: all grades— 90 weeks. Private housing: availability extremely limited; rents range from \$25 to \$45 plus \$15 for utilities. Houses are unfurnished and 1 or 2 miles from base, Should have at least \$500 on hand to render housing habitable. MISAWA AB, 2 mi. WNW of Misawa. Delay for government housing: all grades-62 weeks. Private housing: availability limited. Average rent is \$70 plus \$30 for utilities. Housing adjacent to base. Limited number of trailer-type homes on base can be purchased from \$1,000 to \$1,300. Should have at least \$200 on hand to render private housing habitable.

NAGOYA AB, at Nagoya. Delay for government housing: all grades—92 weeks. Private housing: availability extremely limited. Rents average \$80 plus \$30 to \$60 for utilities. Tenant usually required to furnish refrigerator and cooking and heating stoves. Leases are required and 2 to 6 months' advance rent may be required. All rentals below US standards and water in most areas must be boiled before drinking. Commercial transportation available.

NIIGATA AB. Delay for government housing: all grades—120 weeks, Private housing: availability is poor; unfurnished rentals average \$65 plus \$30 for utilities. Housing usually within 3 to 6 miles of base. Commercial transportation is available.

SHIROI. Delay for government housing: all grades—96 weeks. Private housing: availability fair; units located near base and in Tokyo area. Rentals average \$55 plus \$25 to \$30 for utilities. Most housing within 7 miles of base; housing in Tokyo area requires 30 to 60 minutes' commuting time by privately-owned vehicle; commercial transportation slightly longer.

TACHIKAWA AB, NW of Tachikawa. Delay for government housing: all grades—60 weeks. Private housing: availability is fair to good; unfinished units rent for \$50 to \$160 plus \$30 to \$70 for utilities. Deposit of 1 month's rent required. Housing usually 3 to 15 miles from installation; commercial transportation available.

TOKYO AREA. Delay for government housing: all grades—59 weeks. Private housing: availability is fair to good; unfurnished housing—\$100 plus \$35 for utilities. Limited number of unfurnished apartment hotel units available for \$175 plus utilities and service charges. Leases are usually for 1 year with 1 month's advance rent required. Housing usually 5 to 25 miles from installation; commercial and government transportation available.

YOKOTA AB, 1.5 mi. E of Fussa. Delay for government housing: all grades—72 weeks. Private housing: availability fair; unfurnished 2-bedroom units average \$76 plus \$20 for utilities. Furnished dwellings almost nonexistent. Housing available adjacent to the base and within a 20-mile radius; no commercial transportation.

Korea

KIMPO AB, 7 mi. SE of Kimpo.

KUNSAN AB, 6 mi. SW of Kunsan.

PUSAN AB, 6 mt. NE of Pusan.

SEOUL AB, 3 mi. SE of Seoul.

SUWON AB, at Suwon.

TAEGU AB, 4 mi. NE of Taegu.

(NOTE: No dependents authorized for Korea.)

Labrador

GOOSE AB, 1 mi. W of Goose Bay. Delay for government housing: all grades—42 weeks (assigned to key personnel only). Private housing not authorized,

Libyo

WHEELUS AB, 5 mi. E of Tripoli. Hq., 17th AF, USAFE. Named for 1st Lt. Richard E. Wheelus of the Air Transport Command, killed in 1945 in the Near East. Delay for government (Continued on following page) housing: Field grade—72 weeks; Company grade—92 weeks; NCOs—96 weeks. Private housing: availability poor to fair; rents range from \$60 to \$110 for unfurnished units, plus \$12 to \$25 a month in summer and up to \$50 a month in winter for utilities. Housing seldom equipped with heating unit, clothes closets, or shelves. Furnished units unavailable. Housing located within 8 miles of base; commercial transportation available.

Netherlands

HUSI TER HEIDE. No government housing. Private housing: availability fair to poor; partially furnished units rent for about \$82 plus \$55 for utilities. Share-type houses available at lower price. Rental leases usually required for 1 year. Housing usually within 15 miles of base; commercial transportation very limited.

Newfoundland

ERNEST HARMON AFB, 1 mi. E of Stephenville, Named for Capt. Ernest E. Harmon, specialist in piloting large aircraft and winner of many air trophies. He was a parachute patent expert and ironically lost his life while bailing out of a plane with a chute that failed to open. Delay for government housing: all grades—76 weeks. Private housing: availability in Stephenville is poor, Standard is poor and rent is high; 5-room furnished apartment costs \$150; unfurnished—\$100 plus \$70 for utilities.

PEPPERRELL AFB, at St. Johns. Hq., Northeast Air Command. Named for Sir William Pepperrell of Kittery, Me. (then Massachusetts), an American soldier who served with the Colonial Army in 1746 as a Colonel of the Militia. He was made a baronet by the British for his outstanding service during the French and Indian War. Delay for government housing: Field grade—120 weeks; Company grade—not available; NCOs—104 weeks. Private housing: standard poor to fair; rents average \$85 to \$90 unfurnished, \$120 to \$140 furnished plus \$75 for utilities. Leases are usually for 1 year. Commercial transportation available in St. Johns and to base, but about 50 percent of available housing is beyond transportation lines.

Norway

OSLO. No government housing. Private housing: availability limited; most units furnished. Leases are usually for short periods. One month's rent required in advance. Apartment accommodation for single person is about \$70; large 3-bedroom house about \$200. Average families, 1 to 3 children can obtain housing for \$125 to \$150 including all utilities except heat which costs about \$300 a year. Housing usually 16 to 20 miles from duty station. Commercial transportation adequate.

Pacific Ocean

JOHNSTON ISLAND AFB, on Johnston Island. Dependent travel not authorized.

KWAJALEIN ATOLL. Delay for government housing: Field grade—no delay; Company grade—16 weeks; NCOs—20 weeks. No private housing.

OKINAWA. Delay for government housing: all grades—24 weeks, Private housing: almost nonexistent. Purchase or private construction is authorized. Land leased from private owners for periods of 10 to 20 years at a yearly rate of about \$100. Sale price of privately owned homes is determined by initial costs, less depreciation. Average depreciation will range from \$25 to \$30 per month. Construction can be completed in about 90 days. Total cost ranges from \$3,000 to \$4,000 and must be a cash transaction. The local bank will loan up to 60 percent of the value. Housing sites usually 5 to 10 miles from base. Commercial transportation is fair. Utilities average \$40 a month.

Panama

ALBROOK AFB, 1 mi. NE of Balboa. Named for 1st Lt. Frank P. Albrook, killed in air crash at Chanute Field, Ill., in 1924. No delay for government housing. Private housing may be authorized only for personnel not eligible for assignment to government quarters.

Philippines

CLARK AFB, on Luzon Island. Named for Maj. Harold M. Clark, killed in crash in Canal Zone in 1919. Delay for government housing: officers—20 weeks; NCOs—30 weeks. Private housing: off-base rentals limited to personnel who are not eligible for government housing. Rents range from \$87.50 to \$250, unfurnished. Units generally frame and/or concrete block construction and located 5 to 125 miles from base. Hot water not available in many instances and sanitation, sewage, etc., are below US standards. Electric utilities are about double ZI costs.

Puerto Rico

RAMEY AFB, 5 mi. NNE of Aguadilla. Named for Brig. Gen. Howard K. Ramey, a WW II pilot and later instructor at Kelly Field, Tex., where he became director of the Observation Section of the Advance Flying School. In 1942 he was G-3, 4th Bomber Command, San Francisco. He went overseas as a command pilot and combat observer and was reported missing in action in March 1943. Delay for government housing: Lt. Col. and above—no delay; Majors—20 weeks; Captains—20 weeks; 1st Lt.—30 weeks; 2d Lt.—32 weeks; M/Sgts.—12 weeks; T/Sgts.—40 weeks; S/Sgts.—40 weeks; A/1C with 7 years' service—100 weeks. Private housing: availability is fair; majority of units are unfurnished. Rents range from \$50 to \$125 plus \$12 for utilities. Cheaper units require sharing cold water bathroom facilities. Two months' advance rent generally required plus \$30 deposit for water and electricity. Limited commercial transportation; driving conditions are poor.

Saudi Arabia

DHAHRAN AIR FIELD, 3.5 mi, SE of Dhahran. Government housing for key personnel only, no private housing authorized in Saudi Arabia.

Taiwan (Formosa)

TAIWAN. Delay for government housing: all grades—22 weeks. Private housing: somewhat critical with rent ranging from \$90 to \$150 plus \$8 for utilities for 3 or 4 bedrooms, unfurnished. Cook stove or refrigerator are not furnished. Two months' rent usually required in advance. All drinking water must be boiled.

Spain

MADRID. No government housing.

SEVILLA. No government housing.

ZARAGOZA. No government housing.

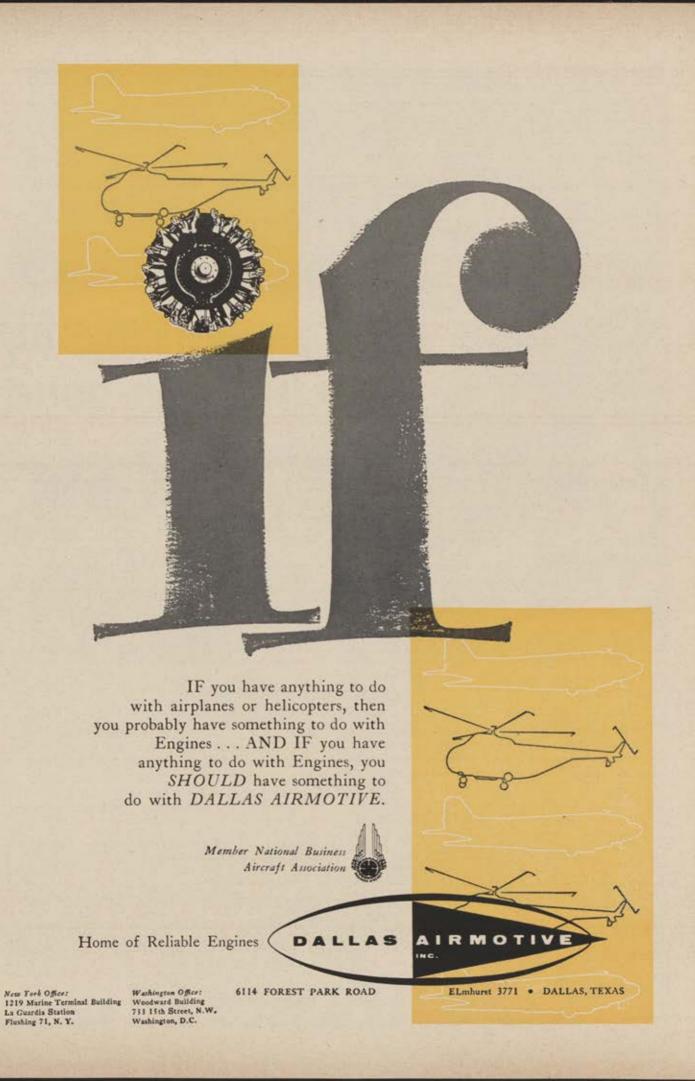
(NOTE: Private housing in Spain: availability is good, standard is fair. Furnished apartments or houses range from \$120 to \$300 and unfurnished from \$100 to \$250, plus utilities. One to three months' rent required in advance.)

Turkey

ANKARA. No government housing. Private housing: availability is fair. Unfurnished housing ranges from \$130 to \$200 plus \$30 for utilities. All units have private bath. Leases are usually for 1 year with 1 month's advance rent required along with deposits on gas, electricity and water. Housing usually from 1 to 5 miles from base; commercial and government transportation available.

ISTANBUL. No government housing. No information on private housing.

IZMIR. No government housing. Private housing: availability is fair except during August and September. Rents, unfurnished, average \$120 plus \$20 for utilities; furnished, \$150 plus utilities. Turkish furniture considered inadequate by US standards. Leases and usually 2 months' advance rent required. Heating systems are inadequate. Distance from installation averages 6 miles.—End





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The READY ROOM

RESERVE AND AIR GUARD NEWS

In the last two years the Air Force has taken a number of steps aimed at producing a Ready Reserve. But none perhaps is so far-reaching as last month's directive that airline pilots must get out of the Guard and the Reserve if they get paid for flying in these components.

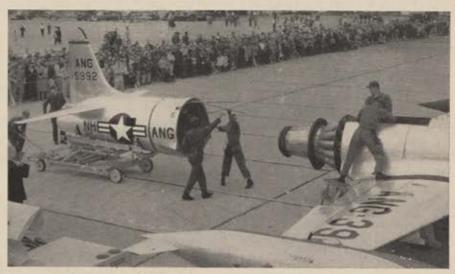
There are hundreds of airline pilots in the paid Reserve and Guard, some of whom are senior officers in command positions. But they go by December 31, along with all other rated airline people, including flight navigators, radio operators, and flight engineers.

The Air Force directive explained that the "kind of warfare that may confront the United States demands that defense plans be geared to a time schedule which permits immediate deployment of personnel and materiel." Therefore, the directive went on, the "availability of all Reservists must be clearly established prior to such emergency."

Airline pilots and key people in the air transport industry, the Air Force thinks, will not be available to go with the Guard and Reserve units upon mobilization. This reasoning is based on the fact that the air transport industry is responsible for providing the Civil Reserve Air Fleet (AIR FORCE, June '56) at the time of mobilization. All airlines already have equipment and crews marked for this fleet, which will perform world-wide air transport missions under the guidance of the Air Force. The majority of airline aircrews are earmarked to go into the Civil Reserve Air Fleet with the equipment they are flying. This being the case, the Air Force says, how can they possibly be mobilized with the Guard and Reserve flying units to which they belong?

The Air Force says they can't go with their units and so must be replaced. All will be reassigned to the non-affiliated Reserve section and may participate in Reserve training through correspondence courses or, if they wish, be reassigned to a Reserve Center to participate in general training. In either case, they can earn points to qualify for promotion and retirement but can earn no pay.

There are two exceptions to the policy. Young Air Guard pilots who went through aviation cadet training by reason of the fact that they had agreed to serve three years with a local ANG fighter squadron will be retained as fighter pilots until they complete this period of service,



An engine change on a T-33 in 8 minutes and 55 seconds—a new record—was accomplished by the 133d Fighter-Interceptor Squadron, New Hampshire ANG, at Grenier AFB, N. H., on Armed Forces Day. To show his faith in his men, Squadron CO Capt. James E. Cuddihee flew the plane immediately after the switch.

The second exception has been authorized for airline pilots who may be needed to help unit training. They may be assigned as overages until such time as others can be trained to replace them.

Six regulations have been revised to reflect Reserve program changes dictated by current war planning. The first, AFR 45-1, which deals with the mission of the Guard and Reserve, now designates all ANG units, all Air Force Reserve Training Category A units, and all Air Force Reserve mobilization positions as Ready Reserve units and positions.

AFR 45-5, the basic Reserve administrative directive, establishes the number of unit training assemblies required annually for each element of the program and also dictates that no Standby Reservist can perform active-duty training tours, nor participate in active-duty training for pay.

AFR 45-3, which covers the Ready Reserve programs, contains a significant change which applies to individuals training against mobilization requirements. All such Reservists will be known in the future as Mobilization Assignees and must be Ready Reservists available immediately for

(Continued on following page)



Robert Taylor, MGM star, chats with Basic Airmen Leon Long, right, and Jimmy Davis during their Hollywood weekend. The airmen were awarded the Hollywood trip as a result of their recruiting activities. Both are members of the 149th Tactical Bombardment Squadron, Virginia ANG, based at Byrd Field, Va.

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extended active duty in the event of national emergency.

AFR 45-17 establishes the procedures for screening Ready Reservists under terms of the Reserve Forces Act of 1955.

AFR 45-19 describes programs available to Standby Reservists and establishes minimum requirements for their participation in training.

AFR 45-35 defines Reserve service obligations incurred as a result of the Universal Military Training and Service Act and provides for involuntary assignment of those who incurred Reserve obligations after August 9, 1955.

A member of the Air Force Association's National Reserve Council, John P. Henebry of Park Ridge, Ill. (see cut), has been reappointed chairman of the Air Staff Committee on Reserve Policy. A brigadier general in the Reserve, he was a combat commander in the Pacific in World War II and a troop carrier wing commander in Korea.

Other Reservists appointed to serve on the committee are:

Brig. Gen. John H. Foster of San Antonio; Brig. Gen. T. B. Herndon of Baton Rouge; Brig. Gen. Clayton Brig. Gen.
John P.
Henebry,
AFA Director, was reappointed chairman of the Air
Staff Committee on
AF Reserve
Policy.



Stiles of New York; Brig. Gen. Paul S. Zuckerman of New York; Col. Daniel DeBrier of Atlantic City; Col. John O. Bradshaw of Lafayette, Ind.; and Col. N. H. Crumley of Elko, Nev.

Brig. Gen. George R. Dodson of Portland, Ore., was appointed chairman of the Air Guard committee membership. Serving with him are:

Brig. Gen. Lewis A. Curtis of Long Meadow, Mass.; Brig. Gen. Allison Maxwell of Indianapolis; Brig. Gen. Philip P. Ardery of Louisville; Col. Emmanuel Schifani of Albuquerque; Col. Philip E. Tukey of Bangor, Me.; Col. Bernard M. Davey of Atlanta, Ga.; and Col. William W. Spruance of Wilmington, Del.

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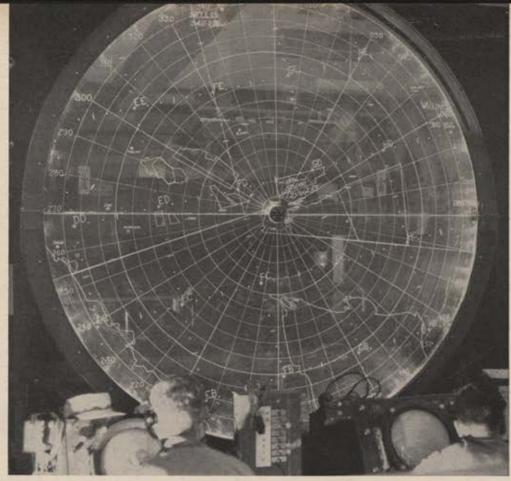
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Intercept controllers vector aircraft to targets from the Yuma, Ariz., direction center.

Controllers fourteen years of safeguarding men and aircraft

SEATED at the radar scope in the direction center at Yuma, Ariz., Intercept Controller Capt. John V. Griswold had no premonition that before the day would end, his quick thinking and skillful maneuvering would save the Air Force an aircraft and possibly a pilot.

What had started as one of the many routine intercepts flown by ADC pilots every day became a life-

and-death matter.

Captain Griswold had just vectored a pilot to an airborne target. At the last minute, Griswold saw that the interceptor was not in the proper position for an attack and ordered the pilot to "break away" without firing. As he broke, Col. Robert P. Baldwin, commander of the rocketry training group at Yuma who was flying "chase," was forced to cut his speed abruptly

to maintain a safe distance behind the intercept plane. When he cut back his throttle, his engine flamed out.

Unable to start the engine and at a comparatively low altitude, Colonel Baldwin called "Mayday," the internationally recognized distress signal, and asked Griswold for instructions. The captain knew, as did the colonel, that a gliding return to Yuma—some thirty miles away—was out of the question. Griswold then remembered an abandoned World War II landing strip at Welton, Ariz., about seventeen miles north of the colonel's position.

Griswold gave the colonel a precise heading and the approximate distance to the strip. At 5,000 feet, a mountain spur broke his radar contact with Griswold, and Colonel Baldwin had to make the decision—should he bail out or try to belly-land? He had just

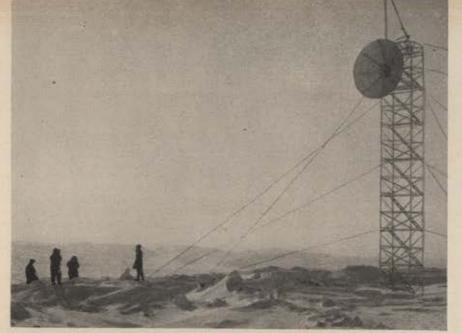
decided on the latter when the Welton strip came into view, and he landed the plane undamaged except for blown-out tires caused by rubble on the unused field.

Next day, after a change of tires, Colonel Baldwin flew his plane back to Yuma.

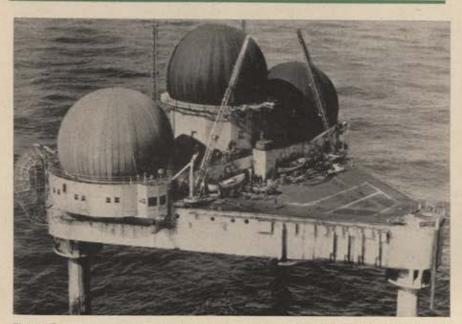
After the emergency, Captain Griswold continued with the day's work of completing intercept missions. While Colonel Baldwin exhibited cool judgment and skill in handling his flamed-out aircraft, there was no public mention of Captain Griswold's part in the drama.

There was nothing unusual about this since intercept controllers are an unheralded breed who sit, in eighthour shifts, twenty-four hours a day, in the darkened operations room of

(Continued on following page)



Distant Early Warning (DEW) line sites, such as this radar station in Canada, provide broader air battle coverage and increase the controller's capabilities.



Texas Towers are among the remote stations to which controllers are assigned.



Aircraft Control and Warning stations, such as this, operate continuously while controllers sit at radar scopes in eight-hour shifts, twenty-four hours a day.

CONTROLLERS

Continental Air Defense Command's radar stations and wait for an enemy who may never come—or who at this moment may be winging his way through Arctic skies.

The rooms are a curious mixture of controlled tenseness and jocularity. Aircraft in the skies are carefully watched on radar scopes and their progress charted on a semi-transparent screen at the front of each room.

If an aircraft on the scopes isn't identified or appears suspicious, interceptor aircraft are scrambled from air bases and vectored to the aircraft for positive identification.

In June, the controller celebrated his



Lt. R. H. Longstaff and his wife live in a one-room dwelling in Minnesota. He is a director at nearby radar site.



The AF's intercept controllers have been on the job for fourteen years.



Technicians mark radar scopes to help controller read and evaluate picture.

fourteenth birthday. But the turn of events (since the controller first helped the pilot stem the tide of the German Luftwaffe during the Battle of Britain) hasn't been very kind to this ground member of the interceptor team.

In World War II, with maximum speeds of 200 to 300 miles per hour and correspondingly low closing speeds, the controller could rectify a mistake in positioning a fighter before the enemy bomber reached the bomb release line.

Today, with speeds of jet fighters and bombers measured in Mach numbers, the requirement is for precision control. The controller must position high-speed fighters on the firing pass in the minimum length of time—with no mistakes.

In reality, controllers are the combat leaders who identify the enemy and establish contact with him. They are more than ever a big part of the backbone of an air defense operation, and their importance ranks equally with that of the fighter crew.

In the future, use of SAGE, or the Semi-Automatic Ground Environment system, will not mean that the controller's responsibilities will be taken over by electronic hardware. Rather, the system is being designed to increase the capabilities of the controller by permitting him to handle a larger segment of the air battle at one time.

Problems facing controllers and other radar personnel stem from the peculiarities of the air defense mission. The nature of the mission dictates a constant state of readiness twenty-four hours a day on a sevenday-week basis. Geographically it requires that ConAD aircraft control and warning units be spread over the whole of the United States and certain parts of Canada. Locations of the units are determined by military necessity, technical requirements, and de-

(Continued on page 209)



Radar operator at an Air Defense Direction Center reports position of a plane.



A/2C Finch Stubbs, Jr., adjusts head set of A/3C Charles A. Pease who is relieving Stubbs at plotting board. Patches cover security information.



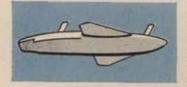
Radar man watches scope for what may be first warning of enemy approach.



In darkened operations rooms, aircraft movements are watched and their progress charted on a large semi-transparent screen at the front of each room.



The remote corners of the world are now accessible to aircraft designed to include the Stroukoff Pantobase landing system. A product of Stroukoff research and development, Pantobase will permit landings and take-offs from snow, ice, water, sand and unimproved terrain as well as standard runways. The increased versatility of the aircraft will reduce the need for conventional airports and contribute materially to the advancement of logistical techniques. The safety of the Pantobase landing system, is assured by the extensive experience and complete reliability of the Stroukoff organization.



Pantobase - When designed into an aircraft the Stroukoff Pantobase system enables the plane to land and take off from many types of surface without changes or additional landing equipment.



BLC - Boundary layer con-trol as developed by Stroukoff increases the effective lift and delays stalling of the wing, thereby reducing required speeds and distances for take-offs and landings.

Achievement is a tradition at Stroukoff. Leaders in the development and design of cargo and transport aircraft, Stroukoff offers challenging opportunities to creative engineers.



TRENTON, NEW



Combat Operations Center at ConAD Headquarters—a maze of maps and lights—would be command post in an attack.



SAGE installations like this will enable the controller to handle a larger segment of the air battle at one time.

fense capability rather than with regard to favorable climatic and living conditions.

As a result, controllers are assigned to duty in units far from large Air Force installations and also from civilian communities where normal services and conveniences are available.

The people who man these ACW organizations face much the same situation here as they do in isolated overseas areas. It is upon these people that the problems of housing, medical care, high rents, schooling, and the like have particular impact. And when they are transferred overseas they are, for the most part, limited to service in such places as Alaska, Canada, Newfoundland, Iceland, and Japan.

In addition to working hours and assignment location, most officers find the controller business objectionable because they feel they are rated as third-class officers in relation to the prestige of the flying officers attached to flying units. Another criticism is the difficulty experienced by rated officers in maintaining their flying proficiency. At many ACW sites it is necessary to drive fifty to 250 miles, often over poor roads, to reach an airfield in order to meet the minimum flying requirements. And present Air Force policy prohibits reimbursement of transportation costs and payment of per diem for such travel.

Add to this the fact that many controllers feel they are in a limited career as far as advancement opportunities are concerned, and you can see why ConAD is faced with a critical shortage of the men who direct the air battle from the ground by radar. Of the controllers now assigned to the command, more than 400 will or have become eligible for separation during

1956 and only ten percent of these men are expected to extend their active-duty tours.

For ConAD, this loss of skilled people constitutes a tremendous handicap. Although the command receives replacements, it is constantly faced with the problem of lack of skill and experience.

ConAD is therefore doing everything it can to increase the attractiveness of the controller job. One action, of course, is to give the controller proper recognition as an extremely important member of the interceptor team.

As a step in this direction, ConAD established a "We Point With Pride" plaque in May 1955, to be awarded monthly to a controller and/or a pilot for outstanding achievement resulting in a saving of aircraft and/or lives.

First controller winner of the award was 1st Lt. David A. Peavy, of the 789th Aircraft Control and Warning Squadron, Omaha, Nebr., who di-

Gen. Earle E. Partridge presents the first "We Point With Pride" award to 1st Lt. David A. Peavy, Omaha, Nebr.

rected a Martin B-57 bomber, which was lost and low on fuel, to a safe landing at Lincoln AFB, Nebr. Through emergency communications procedures, Lieutenant Peavy advised the pilot of the B-57 of the distance out from both Grand Island and Lincoln AFB, the weather conditions, runway information, and facilities available at both fields.

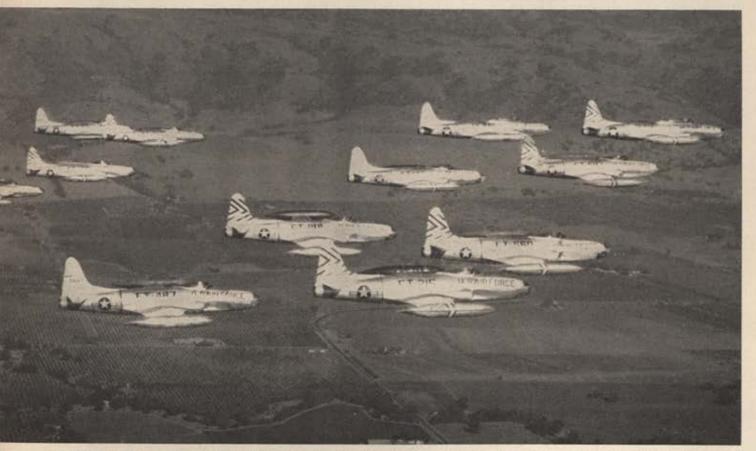
Gen. Earle E. Partridge, Commander-in-Chief of the Continental Air Defense Command, made the presentation of the award to Lieutenant Peavy personally. "These outstanding deeds seldom come to light," he said, "unless we have such competition as this." He predicted that ConAD's radar network will save a lot of aircraft and lives.

The general was referring to the valuable navigational assistance Con-AD's radar network provides to civil, corporation, and military aircraft while, at the same time, electronically scanning for possible enemy bombers.

Recently, for instance, a special board of ConAD officers found that during a year's time an estimated forty-five aircraft "were definitely saved" by radar direction. Although most of this assistance was given to military aircraft, the board reported that civilian aircraft also took advantage of ConAD radar facilities for assistance. This assistance to civilian and military aircraft has been of inestimable value in maintaining a low aircraft accident rate in the US.

But even more important, the controller is charged, along with all of ConAD, "To defend the US against air attack." If the enemy decides to strike, the controller will be the first to see him and will be the man who "pushes the button" to activate the vast complex that is ConAD.—End

NEEDED-A READY RESERVE



Of 2,800 planes in the Reserve and ANG, 1,700 are jets. The piston-engine fighters are rapidly being phased out.

FAMILIAR phrase in Air Force terminology is that of "lead time." The requirement for a global jet bomber, the B-52, was established in January 1946. It was November 1951 when the first roll-out of the XB-52 took place; February 1955 when the first B-52 was delivered to Moses Lake for flight-testing; and June 1955 before the first combat-ready B-52 was delivered to Castle Air Force Base, Calif.

This is normal procedure, widely

recognized. What is not so well known is that "lead time" plays its part in the development of personnel forces—including reserve forces. Time is consumed by recruitment, organization, training, administration, and constant screening. I am pleased to be able to report, however, that in the past eighteen months the Air Force Reserve and Air National Guard have made substantial progress in cutting down the lead time necessary to make them combat-ready.

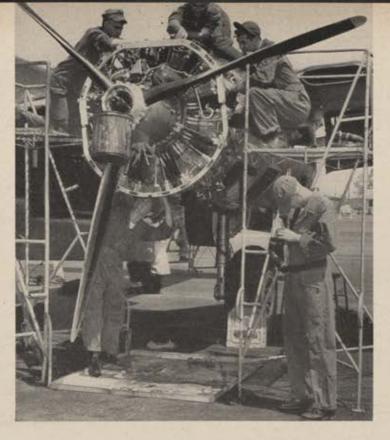
As readers of Am Force know, it was in January 1955 that a firm mobilization requirement was laid down for the reserve components. A total of fifty-one combat wings and more than 100,000 individuals are to be trained, equipped, and available for duty on D-Day. This requirement has shaped all policies and actions taken with respect to the reserve forces over the past year and a half and will no doubt continue to be the governing factor in the program. The Air Staff is giving

FOR D-DAY

By Maj. Gen. William E. Hall

ASS'T CHIEF OF STAFF, RESERVE FORCES

Though the Reserve has on board about as many people as equipment and facilities can provide for, it still needs skilled airmen as badly as it ever did.





AF Reservists from the Pittsburgh area plan a flight during their annual summer encampment at Pope AFB, N.C.

careful attention to further improvement of the program and to all plans having the primary purpose of providing reserve forces, in being, which will be truly ready. This is a difficult job but it must be accomplished.

Certain difficulties have arisen from the careful screening of officers and airmen to be carried in the AA Ready category. A case in point is the airline pilot. Some flying units of the Air Force reserve forces have in the past

(Continued on page 213)



At Long Beach Municipal Airport, Calif., a Reserve pilot briefs his crew before taking off on training flight.



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been manned to a considerable degree by pilots who in their every day civilian lives fly for the airlines. These men would be of great value in reserve units, especially troop carrier wings, except for one glaring condition: many of them would not be available for service on D-Day.

To meet the stupendous airlift our country would require in a wartime emergency, the Air Force has worked out with the commercial airlines an organization known as the Civil Reserve Air Fleet (CRAF). Under this plan the airlines have designated airplanes which in an emergency would augment the airlift capability of the Air Force. The remaining aircraft of the airlines would, through the War Air Service Pattern (WASP), provide such civil and other airlift as required. Therefore, airline pilots and crew members required for either CRAF or WASP duty would not be available for service with Reserve or Air National Guard units. Since this is the case, it would not be realistic to have them continue in AA ready slots.

Our job, then, has been to find replacements for these pilots and to transfer them to elements of the reserve program which do not demand D-Day availability. This has not been a popular procedure but it is the only one which fills the bill of maintaining reserve forces which will be ready for immediate deployment.

The AA Ready requirement has affected many other people in the Guard and Reserve. There are, for instance, the airway operations specialists of the Civil Aeronautics Administration. They are technical experts who would be most valuable to the reserve forces. But if they cannot be available on D-Day, as many of them cannot, it would be futile and unrealistic to continue them in a Ready Reserve status. So it goes with other employees of government and of defense

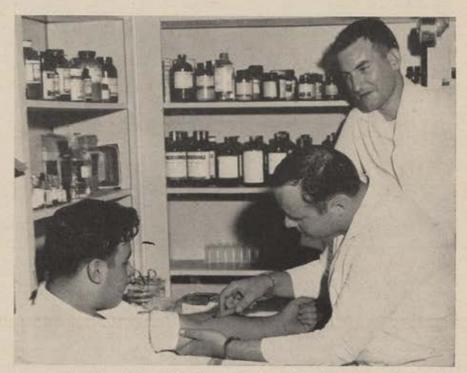
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ABOUT THE AUTHOR

Maj. Gen. William E. Hall has been USAF Assistant Chief of Staff, Reserve

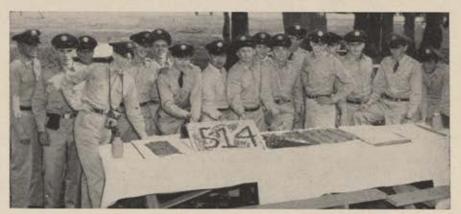
Forces, since 1953. A native of Oklahoma, he was graduated from the US Military Academy in June 1929, and completed advanced flying training at Kelly Field, Tex., in 1934. During World War II he served at AF Hq., and in the Mediterranean and Italy.



Los Angeles Reservists receive instruction in taking blood samples. In the event of a national emergency, our Reserve forces must be ready immediately.



Preflight briefing session for pilots of the Los Angeles area. Flying units of both the ANG and the AF Reserve currently receive very realistic training.



Social contact is as important as duty together for building pride and the incentive to do the job right. Here Reserve airmen take time out for a picnic.



Reservists are called out in emergencies. Here Dave Garroway, covering 1955 floods, talks to a group in Connecticut.

AIR FORCE RESERVE.

CONTINUED

industries. The Air Force policy is clear. If the civil occupation of an officer or airman in the reserve forces is such that he could not serve at once in an emergency, he must be replaced and transferred to an element of the reserve program which does not demand AA Ready status but still can provide points toward retention and retirement.

A number of significant changes have taken place in other areas of the Reserve program. Considerable improvement has occurred in the aircraft situation, for example. All of the piston-engine fighters have been phased out of the Reserve, and the Guard is rapidly phasing out the few remaining in its squadrons. The aircraft inventory of the Air Guard and

Reserve is now in excess of 2,800 planes, of which 1,700 are jets.

To equip the reserve forces with the combat-capable aircraft they need to perform D-Day missions, planes are being transferred to them from the active establishment as rapidly as more advanced models for the active establishment are received from the factories. The outlook for fully equipping fighter and fighter-bomber units with jet aircraft is very promising. Contrarily, the equipping of thirteen troop carrier wings in the Air Force Reserve and six air resupply and air transport squadrons of the Air National Guard is a far more complex problem. Most of the aircraft assigned to these units are C-46s. While the C-46 demonstrated its ability both in World War II and Korea, the number now available is not sufficient to provide full equipping for the reserve forces in the near future. A small number of C-119 aircraft have been allocated to the reserve forces but, again, the number becoming available in the near future will not satisfy requirements. Until this problem of troop carrier aircraft is solved, the full combat capability of reserve airlift units cannot be attained.

Flying units of both the Air National Guard and Air Force Reserve are currently engaged in training of the most realistic type. This includes actual alerts and scrambles for fighter-type units under the direction of Air Defense Command and extended overwater training flights, disaster missions, and Army troop maneuvers for airlift units. All personnel in the unit program, as of June 30, 1956, must be in an AA Ready status and, where appropriate, have on file certificates of availability signed by their employers.

availability signed by their employers.

Training is still being impaired, however, and seriously, by our worst problem—the shortage of adequate facilities, especially for flying training. The Air Force as a whole is having difficulties, construction-wise, but the reserve forces are faced with an exceedingly complicated situation rising from the necessity of finding bases reasonably near where most Reservists live, namely, our cities.

So many elements combine to cloud the facilities outlook that it would be rash to expect an early solution. Apportionment of funds is only part of the problem, although a central and basic part. Public resistance to the use of municipal airports by reserve units is strong and vigorous and seems des-

(Continued on page 217)



Summer camp for a New York Reservist. A/3C John Horn bids his family goodbye as he prepares to take off from Mitchel AFB, N.Y., for Robins AFB, Ga.



U. S. Army Photo

This is one of a series of ads on the technical activities of the Department of Defense.

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From the research, development, production and field service headquarters located at Redstone flow thousands of directives covering the rocket and guided missile work being done by research laboratories, universities and private industry throughout the nation. Weapons systems developed by this Ordnance-Industry team include the Super Bazooka infantry rocket, the Honest John artillery rocket, the Corporal missile and the Nike anti-aircraft missile.

Scientific barriers of all kinds are being broken by the 9,000 employees of Redstone Arsenal, but the exciting and difficult technology of guided missile development constantly presents new problems. Electronic computers click away at missile trajectory formulas by day, while at night rockets equipped with headlights streak down-range, adding valuable data to our country's newest arsenal of defense.

REDSTONE BALLISTIC MISSILE — This long-range rocket-powered, bombardment weapon was developed by the arsenal's guided missile team headed by Dr. Wernher von Braun. The Redstone is the progenitor of the Army's IRBM, the Jupiter.



FORD ENGINEER checking voltage and frequency accuracy of power supply unit under simulated load conditions in a project for the Guided Missile Development Division of the Redstone Arsenal.



tined to increase as more and more jets go into the program. Real estate negotiations are frequently complex. as are construction contracts.

Manning of the Air Force Reserve. in particular, is of course controlled to a considerable degree by the shortage of aircraft and facilities. It is my opinion that there are ways in which the Reserve can be adequately manned-including the ready Category A units. In fact, except for a persisting need for more skilled airmen in the combat and support units, the Reserve already has on board about as many people as the present equipment and facilities can provide for. This is the case, moreover, after many months of careful screening and a necessary spin-off of personnel who either could not or would not train and be available for duty on D-Day.

A personnel item of wide concern is the current status of the Reserve Officers Personnel Act. The Legisla-tive and Liaison Branch in Headquarters recently conducted a canvass of Reserve officers to obtain opinions from the field regarding ROPA. As a result, it received a large number of suggested changes. In fact, if all the suggestions were adopted, some twenty-five to thirty sections or subsections of the act would have to be amended.

A recommendation went forward that the Secretary of the Air Force appoint an ad hoc committee to study these and other possible changes. Until such a study has been completed, it cannot be predicted what the Air Force position on the suggested amendments will be or the probability of their being included in the Department of Defense legislative program for 1957. Meanwhile, the Air Force is meeting the requirements of ROPA as they stand. Many thousands of Reserve promotions have made and others are contemplated.

Now, a word with respect to the promotions to the grades of captain and colonel, which have not been acted upon since July 1955. Early this month it was announced that boards would be convened late this summer or early fall to consider eligible personnel.

With respect to colonels, Headquarters announced a five-year plan for the promotion of Reserve lieutenant colonels to the grade of full colonel. Over the five-year period, it is expected that about 7,000 officers will become eligible, with about 1,000 to be selected for promotion during the period. In Fiscal Year 1957, only those officers with ten years in grade



will be eligible, since there are so many with nine and ten years in grade. However, the long-range objective of the plan is to reach an eligibility criteria of five years in grade. The entire plan, designed to build up gradually the Air Force Reserve to the strength authorized in grade of colonel in ROPA, is similar to the plan in effect for permanent promotion of regulars to colonel.

Another recent development worth

noting is that for the first time in three vears Fiscal Year 1957 will see about 550 officers and warrant officers recalled to active duty on application and acceptance. Jet pilots are, of course, particularly needed but there are other skill areas and AFSCs open. Officers to be selected cannot hold Reserve rank higher than captain, except for a very few major slots in supply, and research and development fields.

One change in the nature of Reserve training should be touched on. B-2 training-or specialized non-paid training-was discontinued at the close of June, this year. This action was based on the premise that everyone participating in specialized courses should be training against a mobilization requirement and should be paid.

Thus, we come round the circle again to the overriding need for AA Readiness in the Reserves. It must always be kept in mind that the size and character of the reserve forces are sharply defined by the latest Air Force War Plan which supports the Joint Chiefs' of Staff current War Plan. The Joint Chiefs' War Plan. naturally, must be very broad in its concepts. Those concepts have to be worked out in detail by approved war plans of the individual services.

The present Air Force War Plan, which was developed last year but is always subject to some change or modification, contains the concept that our reserve forces in the event of national emergency will be needed within the early days of hostilities. It seems reasonably assured that all future war plans will continue to spell out that D-Day requirement.

Briefly, unless and until our reserve forces are brought to their maximum degree of combat capability, the Air Force as a whole will be standing short of its total War Plan requirements. That is a serious challenge which must be accepted by us allthe general public, the active establishment, and above all by the Reserv-

ists themselves.-END



Texas A&M AF-ROTC cadets board plane for Carswell.

Airlift of AF-ROTC Cadets

OPERATION FRESHMAN

OW does a freshman Air Force ROTC cadet know what the skies have to offer him? He must wonder what's ahead, what it's like to fly. And while he wonders he wants to find out all he possibly can about it

Sure, he can sit in a college classroom and stare at the blackboard
while the instructor tells him it's a
wonderful career. He can read about
it in textbooks put out by the Air University. But how can a man who has
never been in an airplane, never been
near the "line" with its smell of grease
and burned fuel and the noises of
props and jets, tell whether he'll like
to fly? How can he tell, unless he actually gets in a plane?

That's the problem that bothered Col. Henry Dittman. Last summer he reported to Texas A&M College as Professor of Air Science. Of the 1,718 Air Force cadets who enrolled in September, only 171, all seniors, had become familiar with Air Force life through summer training camp. Some of the upperclassmen had been on indoctrination flights from previous years. A very few of the others had some civilian flying time. But most of the cadets had an average knowledge of flying gained from movies and pictures.

On graduation, these men are scheduled to be commissioned as second lieutenants, Air Force Reserve. Most of them will enter flight training. It's a little late then to find out whether they like to fly. Costly, too, in case a man finds out at this stage that airplanes just don't appeal to him.

Colonel Dittman called his staff together. The time to find out whether these students want to fly, everybody agreed, is now. A plan was developed and put into effect. Instructors who were pilots went on scheduled Saturday morning flights, taking sophomores up in North American T-28s borrowed from Bryan AFB. Upper classmen were flown in Lockheed T-33s whenever flights could be scheduled. Special trips were arranged to introduce others to the airplane. But it wasn't enough. Fewer than 600 had been airborne by the spring sessions.

"Operation Freshman," the largest college cadet airlift, was the answer. Five hundred and three freshmen, plus supervisory upperclassmen, a few civilians, and Air Force personnel were flown cross-country on a round trip that brought them close to Air Force life.

Airplanes from five different commands converged on Easterwood Airport, College Station, Tex., on March 22. The Military Air Transport Service sent a C-118 and a C-54. The Air Materiel Command furnished a C-46 and two C-47s, while a C-119 was sent up by the Strategic Air Command. The Continental Air Command flew in with two C-46s, and the Air Training Command sent seven T-29 Flying Classrooms. Although the weather looked threatening, the first contingent of cadets took off early in the morning.

As soon as the planes were airborne, crew members began answering questions. Cadets were allowed to visit the cockpit and visit with the pilots. On the T-29s, cadets sitting at the tables were interested in the navigation equipment. Several who had never been in an airplane kept asking about cloud formations. All too soon they landed at Carswell AFB near Fort Worth, Tex.

Following orientation talks by Air Force officers, the cadets went to static displays of B-36s and climbed through every crew station they could find. They saw engine build-up shops, flight simulators, an altitude chamber and talked with ground and aircrews. They crossed the field and went through the Convair aircraft factory. Late in the afternoon they again boarded airplanes and flew back to home base, very thoroughly indoctrinated.

"Operation Freshman" wasn't important because it was the largest cadet airlift or because five different commands cooperated. It was important because Colonel Dittman can now look at every member of his freshman cadet class and say, "You've been airborne. You know what it feels like to fly. You've seen this man's Air Force. Now you know why you have to study hard for the next three years to get a commission. Now you know whether you like to fly. If you don't like it, now's the time to leave. If you did like it, let's hustle!"—Enp



ROTC cadets James Johnson and Robert Harris get a close look at the B-36.

The pioneer manufacturer of packaged high pressure pneumatic systems now offers two additional high capacity compressor packages designed specifically for fuel air starter systems.

The Cornelius Company has designed two new "packaged" pneumatic systems. The new Models 86D1500 (10 CFM) and 86D1600 (7 CFM) 3000 PSI packages provide complete air supply systems up to the air reservoir.

These new "package" system's combine inlet air filter, absolute pressure regulator, compressor, moisture separator with thermostatically controlled heating element, automatic condensate dump, check valve, pressure switch, relief valve and back pressure valve into a complete pre-tested, functional system ready for installation in airframes.

Save weight and space with Cornelius "packaged" pneumatic systems by eliminating separate components, associated tubing, fittings and flare connections. "Packaged" systems mean potential leakage sources are eliminated and system reliability is increased. Qualification of complete "packaged" system assures optimum compatibility of all components.

The enthusiastic acceptance of Cornelius high pressure "packaged" pneumatic systems is evidenced by widespread use of Cornelius Model 130 compressor packages. Model 130 "packages" have been proven by thousands of hours of flight service in the aircraft named below. Cornelius "packages" are I.D.E. approved as complete functional air supply systems.

MODEL 130R1301 DC MOTOR DRIVE

> Grumman S2F Lockheed P2V Martin P5M

MODEL 130R1901 AC MOTOR DRIVE

> Martin P6M Canadair CL-28

MODEL 130R2101 AC MOTOR TANDEM DRIVE

> Boeing KC135 Boeing B52

In addition, Model 130 series compressors are used in McDonnell F2H-3, F3H; North American FJ-2, FJ-3, FJ-4; Chance Yought F7U-3, and Grumman F11F-1.

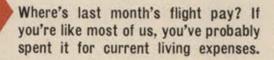
For details about the two new Cornelius compressor "packages" write for complete engineering data.



PIONEERS IN THE DEVELOPMENT OF AIRCRAFT PNEUMATIC SYSTEMS

exclusive now for the first time you can

ROTECT



If you suddenly lost your flight pay, could you continue to handle your financial commitments for even a short time?

And you could lose your flight pay. Any time you can't qualify for flight status because of accidental bodily injury or disease, your flight pay stops.

Now, for the first time, you can guarantee your flight pay income against loss. AFA's new, exclusive flight pay protection plan provides up to twenty-four monthly payments at the rate reported on your insurance certificate.

IF YOU'RE ON FLIGHT STATUS SIGN UP TODAY TO PROTECT YOUR FLIGHT PAY!

YOUR FLIGHT PAY

HERE'S HOW THE PLAN WORKS FOR AIR FORCE ASSOCIATION MEMBERS

You sign up and pay an annual premium of only 1/100th of your yearly total flight pay. (Example: Your flight pay is \$1,800 a year. The plan costs you 1/100th of \$1,800, or \$18.)

Then, if you're grounded due to accidental bodily injury or disease, our AFA Plan pays you monthly indemnity for loss of flight pay for up to twenty-four months—after a waiting period of 181 days for military aviation accidents, and after ninety days for other accidents or disease. The insurance payments pick up retroactively where the government left off.

When you go back on flight status, or at the end of twenty-four months, the payments end. But by that time, if you can't requalify for flight status, you should be able to adjust your commitments to conform to your reduced income.

All members of the US Air Force, Air National Guard, Air Reserve, and the other military services, who are on flight status and who belong to the Air Force Association, are eligible.

NOTE: Of course this protection does not apply in case of war, declared or undeclared, or hostile action, civil war, invasion, or the resulting civil commotions or riots. There are also other exclusions which may never apply to you, but you are entitled to know them. They are as follows:

Plan does not cover losses due to criminal act of the AFA member; or from bodily injury occurring while in a state of insanity (temporary or otherwise); or from officially certified "fear of flying"; or caused by intentional self-injury, attempted suicide, criminal assault committed by the Member, or fighting, except in self-defense; or from failure to meet flying proficiency standards unless caused by or aggravated by or attributed to disease or accident; or accidents caused while riding or driving in any kind of race; or by alcohol, drugs, venereal

disease, arrest or confinement; or willful violation of flying regulations resulting in suspension from flying as a punitive measure; or sentence to dismissal from the service by a general court-martial, submitted resignation for the good of the service, or suspension from flying for administrative reasons not due to accident or disease or voluntary suspension. Loss of life shall not be deemed as loss for purposes of this plan.

In the event you receive the total limit of twenty-four (24) months' indemnity, your coverage is automatically terminated. You may thereafter reapply for insurance coverage in the same manner as a new Member. Coverage also ends with termination of membership in AFA, or with resignation, retirement, or pensioning from the service, or at age sixty.

This insurance is renewable at the option of the Company.

Policy Form No. 1-620-3A.

ALL MEMBERS OF THE USAF, AIR GUARD, AIR RESERVE, AND OTHER SERVICES WHO ARE ON FLIGHT STATUS ARE ELIGIBLE, IF THEY BELONG TO THE AIR FORCE ASSOCIATION.

APPLICATION FOR PROTECTION OF FLIGHT PAY INCOME EXCLUSIVELY FOR MEMBE	KS OF THE AIR PORCE ASSOCIATION
SEND REMITTANCE TO AIR FORCE ASSOCIATION, MILLS BUILDING, WASHINGTON 6, D. C.	
NAME, RANK, SER. NO., COMPONENT (USAF, ANG, ETC.)	NON-MEMBERS
MAILING ADDRESS	☐ I enclose an additional \$5
AMOUNT OF ANNUAL FLIGHT PAY	membership dues. Enroll me
I certify that I am currently receiving incentive flight pay.	as a member of Air Force Association.
SIGNATURE	
The annual premium charge is 1% of annual flight pay.	
APPLICATION MUST BE ACCOMPANIED BY CHECK OR MONEY ORDER FOR ANNUAL PREMIUM.	



Faced with the problems of weather phenomena, fuel management and emergency conditions, these young pilots take them all in stride—and return safely to their "base," without ever leaving the ground. Their training in an ERCO flight simulator is just like the real thing... yet it eliminates risk, both to lives and to costly equipment, conserves many valuable man-hours.

Production of the Boeing KC-135 simulator for the U.S. Air Force is one of the newest projects at ERCO, designers and builders of flight simulators for more different types of military aircraft than any other manufacturer. Electronic masterpieces like this speed pilot and crew training, save the military countless lives, hours and dollars.

Let ERCO design and production facilities serve you when the job calls for:

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QCF INDUSTRIES, INCORPORATED



Scoring target sleeve hits. Each pilot's bullets are dipped in a different colored paint which marks the sleeve.

THE AIR GUARD and Its Mission in Today's Airpower

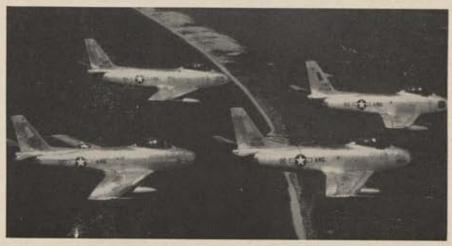
OME FEW weeks ago while visiting a new Air National Guard installation, I stood in the shade of a modern, concrete-block building watching a very young second lieutenant as he painstakingly recounted the hits he had scored in an air-to-air gunnery target.

From the remarks of others standing about, I soon learned that he had been firing green paint-dipped ammunition and that his flight commander, a captain, had been firing blue. The similarity between these colors-or, more specifically, the difficulty in distinguishing between the faint traces of them that had been left by the bullets' piercing the target's polyethelene fibers-had inspired a very serious debate. A hamburger luncheon-plus, of course, a certain amount of prestige -hinged upon its outcome.

As you might naturally suspect, the captain won the dispute, proving rather conclusively that rank and its privileges-even in this day of the

(Continued on following page)

By Maj. Gen. Winston P. Wilson CHIEF, AF DIVISION, NATIONAL GUARD BUREAU



Even with a big transition from propeller fighters to jets in the past year, ANG flying hours increased while accidents declined. Above, four DC ANG jets.



A new Air National Guardsman gets some friendly help. Because the ANG has a dual role—local and national—an oath to the state and the US is required.

fifty-cent hamburger-remains as effective in the peaceful settlement of such issues as it was in my own early Guard days when hamburgers were only a dime and the gunnery skill in my squadron, unfortunately, was proportionally as much lower.

But aside from demonstrating the prerogatives of the wearer of two silver bars in contrast to those enjoyed by the wearer of a single gold one, each element of that scene blended to present to me a far more significant picture—a picture that is duplicated almost daily throughout the Air National Guard's system of bases in all the states and territories. The new hangar, the jet aircraft roaring on take-off down a recently lengthened runway, the second lieutenant who

Loading ammunition. At the AF's world-wide gunnery meet at Nellis AFB, Nev., last September, an ANG wing came in third place against the best in the AF.

was one of the 363 young pilots who were graduated from regular Air Force flying schools in the Air National Guard's aviation-cadet training program during the past year, the remarkably great number of colorstained holes in the target, and certainly the intense professional pride of the young officers who had put them there—all combined to give a graphic indication that the Air National Guard has reached a stage of its development which would seem to belie the brief years of its existence.

For despite the fact that we Air Guardsmen trace our lineage to a Lt. Col. C. B. Winder of Ohio—who on June 5, 1912, was graduated from the Army's Signal Corps Aviation School at Augusta, Ga., thus qualifying as the National Guard's first military aviator—the Air National Guard, as such, did not come into being until 1946.

On June 30 of that year, the 120th Fighter Squadron of Denver, Colo., was federally recognized. With a handful of already obsolete North American F-51 Mustangs assigned to it at that time, it became the Air National Guard's first flying unit.

Today, in comparison, there are a total of ninety-four of them plus 529 other organizations. The former include fifteen fighter-interceptor wings, eight all-weather equipped air defense wings, two tactical bombardment wings, two tactical reconnaissance wings, four air resupply groups, three tactical control groups, and three communications groups, as well as the support-type units required by these in the performance of their federal and state missions.

That dual—local as well as national—role of the Air National Guard, incidentally, is quite confusing to some, although it is simple enough in explanation.

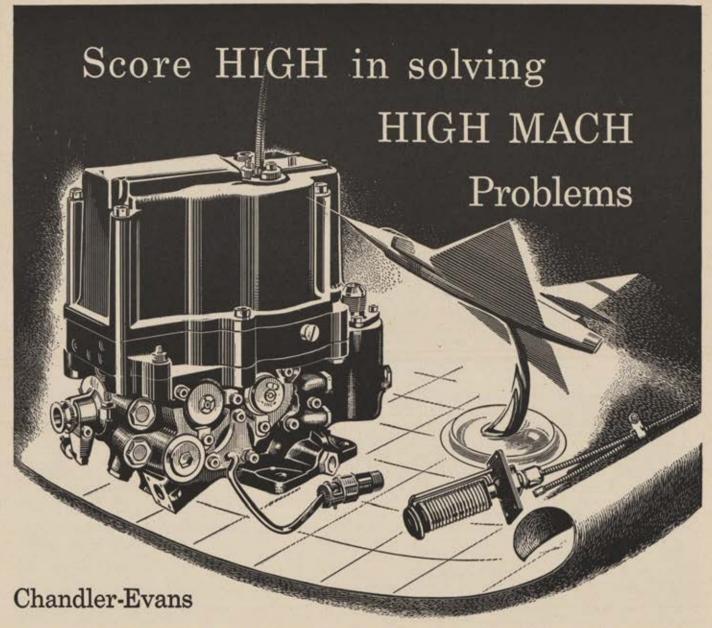
The Air National Guardsman is required by law to be a member of the Air National Guard of his state before he can become a federally recognized member of the Air National Guard of the United States.

In the former capacity, he takes an oath to uphold the constitution of his state and to obey the orders of its governor as his commander-in-chief.

Immediately thereafter he takes a similar oath to uphold the Constitution of the United States and to obey the President as the Commander-in-Chief of all our country's military forces.

In both cases, if the man is an officer, he is granted a commission, (Continued on page 227)

AIR FORCE Magazine . August 1956



AIRCRAFT FUEL CONTROL SYSTEMS and COMPONENTS

HIGH MACH at extreme altitude creates heat problems that cripple conventional fuel systems. CECO has already created new control designs that solve many such problems. Save time...take advantage of the advanced research and development at CECO which provide the fuel control systems and components to solve YOUR high Mach problems.



Makers of Jet Aircraft Accessories Produced TODAY to meet TOMORROW'S Progress



TARGET ... OIL

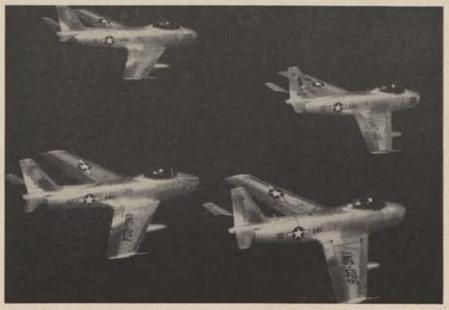
The target of the torpedo-like device hanging from this plane is not the land you see ahead, but the oil that may hide beneath it.

Spearheading the mission, this sensitive instrument, known to petroleum men as a magnetometer, records the earth's magnetic field, indicating which land is most favorable for the presence of oil.

It is a lucid illustration of the interdependence of the petroleum and aviation industries. For as petroleum supplies the power of aviation, so aviation supplies the means to search for this power. Cities Service has long utilized aviation for this important work. Likewise numerous airlines and airports have long utilized Cities Service products for their work. And just as these airlines and airports strive to provide the finest planes and service, Cities Service continues to provide the finest petroleum products to service these planes.

That's why you can always be sure of the highest quality aviation oils and gasolene wherever the familiar Cities Service aviation emblem is displayed. Look for it.





As of May 31, 1956, the ANG had 1,432 jets and only 150 prop-driven fighters.

and his federal commission is identical to that of the Reserve Commission of the Air Force officer who joins the Air Force Reserve.

So it was that during the past year you have seen Air National Guardsmen on state-ordered missions assisting flood and storm victims in areas from New England to California, searching for airline crash sites in Colorado, Wyoming, and Arizona, and -in one particularly notable caseflying an Army surgeon from South Carolina to Washington so that he could be at the bedside of President Eisenhower during his recent illness.

So it was, also, in 1950 and 1951 that you saw sixty-six of our tactical squadrons plus a great number of other units ordered to active service during the Korean emergency, that since August of 1954 you have seen seventeen of our fighter squadrons contributing active-duty detachments to the security of our country in a program designed to augment the Air Defense Command of the Air Force in certain strategically vital areas and to provide the finest training possible for those crews who participate in the

Toward that end, the Air National Guard has been consistently building, and the past year-while less spectacular, perhaps, than many that preceded it in our growth-has been one of the best in the long process.

One of our most perplexing difficulties twelve months ago concerned installations. We now have solved all but a few of these by the construction of new facilities, such as in Ohio, Texas, and West Virginia, where squadrons already have moved into new bases, and in two other states where similar moves soon will be

Another solution has been the removal of some units from inadequate locations to existing satisfactory ones. At Van Nuys, Calif., where jet operations had been vigorously opposed,

the problem solved itself very handsomely when the citizens of Los Angeles overwhelmingly approved a bond issue to improve its airport complex-a project that will include the underpassing of a heavily traveled street and the extension of a runway above it at San Fernando Valley airport where California's 146th Fighter-Interceptor Wing and the 115th and 195th Fighter-Interceptor Squadrons are based.

Our recruiting efforts have been similarly fruitful.

Exclusive of the engineer aviation battalions which reverted to Army National Guard control last March, we started the past fiscal year with 6,463 officers and 50,959 airmen. Eleven months later, those figures had



Scores are posted at ANG gunnery meet.

expanded to 7,300 and 55,800, and of the officers, approximately 3,400 were pilots.

This steadily increasing strength is primarily of interest because we, like everyone else in the manpower market, are in competition with the regular establishments, the other reserve components and to a lesser extent with industry in our efforts to obtain men with the skills and the aptitudes we require to sustain our operations.

This, I might add with positive emphasis, is now a critical need that shortly promises to become urgent. Consider the problem:

On July 1, 1955, there were 259 outmoded but comfortably familiar conventional fighters and 1,276 jets in our inventory. As of May 31 this

(Continued on following page)



ABOUT THE AUTHOR

Maj. Gen. Winston P. Wilson, Chief of the AF Division, National Guard Bureau,

was born in 1911 in Arkansas and was graduated from Hendrix College. He was commissioned in the Arkansas National Guard in 1940 and, after serving with several groups, became Chief of the Tactical Reconnaissance

Branch at Army Air Corps Headquarters, Washington, D. C., in 1943. In 1944, he was named Commanding Officet of the 16th Photographic Squadron with missions in South America, Alaska, and the US. General Wilson went to the Pacific in 1945 as liaison officer between the Far East Air Forces and the mapping squadrons in FEAF. He was separated from active duty in 1946 and returned to the Arkansas ANG. The AF recalled him to active duty in 1950 and he succeeded Maj. Gen. Earl T. Ricks in his present position when General Ricks died in 1954.



The ANG competes with the regular establishment and the other reserve components for men with the needed skills.



Good maintenance has increased the in-commission status of ANG jet aircraft, even in a period of rapid transition.

AIR GUARD.

CONTINUED

year, only about 150 of the propellerdriven Mustangs remained, and our jet count had climbed to 1,432. The complexities of converting from one type to another suggest themselves, but it should be pointed out, too, that these were compounded by the electronic fire-control systems and other automatic features of some of our most recent acquisitions.

Among these were the Republic RF-84Fs that went to four of our squadrons, the Northrop F-89Cs that have been assigned to five others, the Lockheed F-94Cs that went to North and South Dakota, and—of separate significance—the North American F-86Ds that have been assigned to the 159th Fighter Squadron of Jackson-ville, Fla., to determine our capability for operating these advanced aircraft and to determine the "lead-time" and support we would require when we receive large numbers of them.

Under the circumstances, I feel it would have been pardonable if our tactical flying hours for the year had declined and had remained low until our maintenance technicians had had more time to acquaint themselves with the strange new systems of these aircraft and until our pilots had had more time for the transition required of them. Happily, however, the reverse is true, Our hours flown in this category of operations have increased and during the same period our accident rate, one of the truest gauges of proficiency, has declined.

A part of this accomplishment, it is true, can be credited to the thirty-six flying training periods that Air National Guard air crewmen have been authorized in addition to the regular, annual forty-eight four-hour unit training assemblies and the fifteen-day field training exercise. Another factor is the aggressive assistance that Continental Air Command and the numbered Air Forces are contributing in their supervision of training and in their establishment of accident prevention procedures. I am confident that it indicates a further shift of training emphasis to combat preparedness and that it reflects a new trend toward increasing capability.

This is even more clearly to be seen in our ability to maintain our aircraft in commission, as these comparisons will disclose.

For jet aircraft last year we had an in-commission status of sixty-two percent. This year the average was sixty-five percent—despite the fact that there were fewer of the all-weather type aircraft in the Air National Guard program a year ago.

The continued allotment of quotas for Air National Guardsmen to attend the appropriate Air Force technical schools, a program that has proven so successful for us in the past, would seem to justify that optimism.

It is probable, indeed, that our unfamiliarity with the engines, the systems, and the performance characteristics of these airplanes might soon be a thing of the past and among the least of our worries. But a new one, sprung full grown from the rear seat of some of those new fighters, already is with us. That is our crippling shortage of radar observers,

With a total authorization of twentyfour per squadron of these commissioned specialists, our squadrons with the requirement for them have an average of only six.

Whatever the solution to this problem, however, we intend seeking it in the only area in which we presently know to search—intensive recruiting for personnel with the existing necessary qualifications and an interest in the radar observer cadet training program. Our partnership in the air defense business, into which we entered officially on the first of the past fiscal year, makes it mandatory that we succeed. This observer program is a new one, and we feel that it will—like the pilot training program—produce desired results.

Along those lines, it might be recalled that in the September 1955 issue of AIR FORCE Magazine, I wrote that our air defense mission is consistent with our National Guard traditions of repelling a hostile host from our homes, and that we intended modernizing our fighter units in accordance with our new responsibilities. Since then, fifteen states which have all-weather aircraft assigned to them have been authorized to reorganize their units to conform with the organizational structures of the Air Defense Command, which includes air defense wings and air defense groups.

Other changes are in the offing and other challenges are yet to be met, but we anticipate most of the former and are looking forward to the latter, Among the challenges, though, I would like to mention at least one.

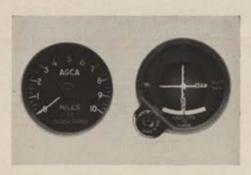
At the Air Force's world-wide gunnery meet at Nellis AFB, Nev., last September, our 140th Fighter-Interceptor Wing team consisting of Air National Guardsmen from Colorado, New Mexico, and Wyoming won third place against the best in the Air Force.

This year, Nebraska and Iowa Air Guardsmen of the 132d Fighter-Interceptor Wing intend to win first place, and if determination counts for much, they will.—End Progress report: No. 2 of a series

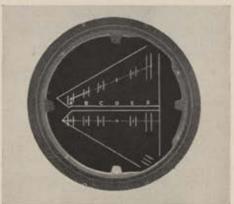
Now undergoing official flight test evaluation at USAF Rome Air Development Center, Rome, N. Y.



GILFILLAN AUTOMATIC GCA



AIRBORNE DISPLAY: Airborne instrument panel continuously displays elevation and azimuth deviation, and distance-from-touchdown data, enabling pilot to monitor automatic approach or to override autopilot for manual approach or to monitor standard GCA talkdown. When aircraft reaches IFR field minimums, a warning light automatically advises pilot.



GROUND DISPLAY: Each of AGCA's six tracking channels, in turn, automatically searches for and locks on successive aircraft and transmits proper control signals for individual automatic approach. Schematic shows aircraft A, B, C and E on automatic approach, aircraft D on GCA talkdown, tracking-channel F on search.

Aviation authorities attending current RADC evaluation tests agree Gilfillan Automatic GCA will demonstrate remarkable efficiency in handling high-density, mixed aircraft rapidly, and with complete protection for all aircraft in the landing pattern.

Favorable comment is being made on AGCA's proved mixed traffic handling capacity to provide (1) Automatic approach, (2) complete position data to pilot for manual approach or (3) standard GCA talkdown-to individual aircraft as required, in the same constant stream of traffic.

Gilfillan AGCA does not obsolete existing equipment, but functions as an extended automatic use of proven basic GCA and standard airborne telemetering equipment, relieving the GCA operator of vocal transmission of data, and the pilot of the manual chore of flight path correction. AGCA, with one monitor, takes the place of six GCA operators and several GCA equipments.

AGCA obtains aircraft position from basic GCA electronically, transmits flight correction data by radio impulse to standard airborne equipment, which activates autopilot with correct up/down right/left control for smooth approach to the runway.

AGCA also provides the pilot with range information and complete altitude and azimuth control data on his instrument panel at all times, enabling pilot to monitor automatic approach, or, optionally, to override autopilot for manual approach utilizing 3-dimensional data provided by AGCA, or to monitor standard GCA talkdown.

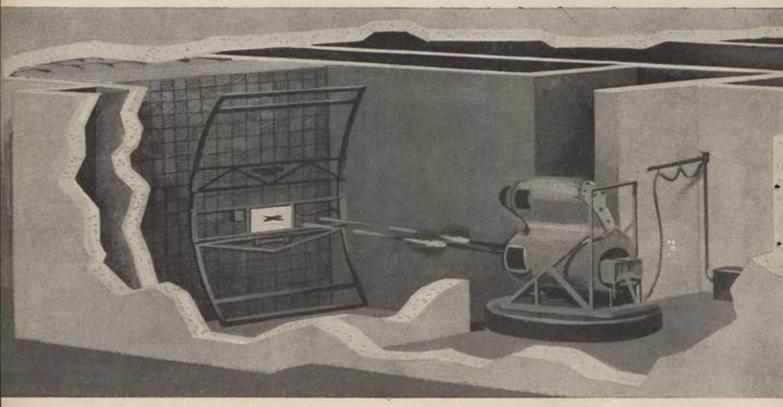
Pilots flying in RADC tests note that each individually controlled aircraft is also protected as part of the continuous traffic flow, through the "block signal" system of automatic overtake warning and instant closed-loop indication of any deviation from safe landing limits.

AGCA is the result of ten years of joint research and development by USAF Rome Air Development Center and Gilfillan.

PRIME CONTRACTORS FOR COMPLETE SYSTEMS

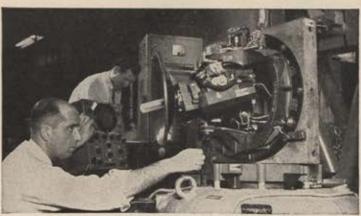


Here's How Facilities at General Electric Speed





ENVIRONMENTAL TEST CHAMBER simulates atmospheric conditions found at altitudes up to 100,000 feet.

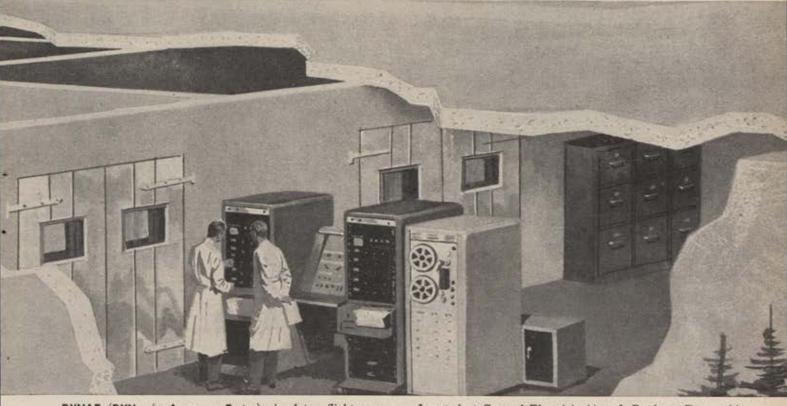


AIRBORNE EQUIPMENT such as the radar antenna being tested here is subjected to severe vibration tests.



DIGITAL COMPUTER, designed and built by General Electric, is used to help solve airborne defense system problems.

Electronic Bomber Defense System Development



DYNAT (DYNamic Accuracy Tester) simulates flight conditions and combat situations on an indoor test range, minimizing costly flight tests and reducing qualification time.

Located at General Electric's Aircraft Products Dept., this installation permits all-angle fire testing of electronic bomber defense systems at temperatures ranging from $-100\mathrm{F}$ to $160\mathrm{F}$.

G-E Facilities Help Researchers Anticipate and Solve Problems Prior to Airborne Tests

Cutting lead time in the development of aircraft equipment has become increasingly important. All possible measures must be taken to reduce development and testing time in order to speed delivery of operational aircraft to our armed forces.

General Electric test facilities provide an important means of reducing development time of airborne defense systems. The test facilities pictured here help experienced G-E personnel to analyze and solve problems difficult if not impossible to duplicate by flight tests. Just as important is the saving in valuable time and reduction in expense of airborne testing. These facilities help make the saving possible—speeding the development of aircraft defense systems for tomorrow.

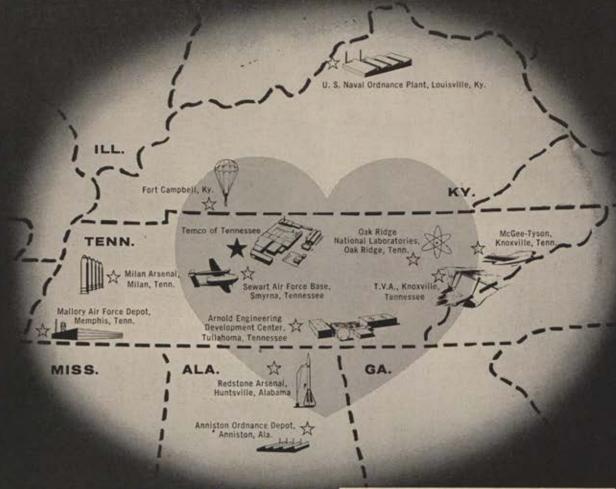
Engineers: Expanding electronic bomber defense projects at G.E. are creating opportunities for you. Contact C. E. Irwin, General Electric Company, Aircraft Products Department, Johnson City, N. Y. 22-3

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The Hawk and the Dove

The paper the other morning carried a picture of the new Lockheed F-104, just unveiled by the Air Force. Reading the description was enough to make us World War II pilots feel like old men. Better than 1,400 miles an hour. Vertical climb at supersonic speed. As much power, under certain conditions, as a light cruiser—60,000

while you knot your tie, seventy while your breakfast egg boils. It means flying from New York to Philadelphia in three and one-half minutes, to Chicago in thirty-one, to San Francisco in 112, to London in 150. It means flying from where you are to the most distant part of the globe in nine hours. It is obviously a short-range weapon,

"fast" meant the bulldoggish Boeing P-26s that flew in on training hops. This scrappy little job had 600 horsepower and could make almost four miles a minute, wide open. Without flaps to slow its approach, the '26 looked awfully hot, three-pointing on the grass. Then came the Seversky P-35 with 950 in the nose and a top speed of nearly 300. How slick it looked with its retracting wheels and enclosed cockpit and how antiquated









Things have come a long way since the late thirties and the four-miles-aminute (wide open) P-26, center top, the 300-mph P-35, left, and the P-36 above, which hit 550 in a power dive. At 1,400 mph, the F-104, far left, travels four miles each ten seconds.

horsepower. One of the most interesting things about the picture was where our editor put it, on page five next to a local bit about traffic accidents. Fourteen hundred miles an hour is not front-page news in this era.

Fourteen hundred miles an hour! How many people really know what that means? We who drive at sixty and fly our little planes at 120 and ride the airlines at 300, what do we know about this kind of speed? It's so incredible as to be almost meaningless. We have to divide by time and distance to find numbers we can understand and these new numbers seem all the more unbelievable.

Fourteen hundred miles an hour means flying twenty-three miles in the time it takes to brush your teeth, seven designed to hurtle into the stratosphere, unleash its missiles and return to earth, all in a matter of minutes. But with planes, speed comes first, endurance later. Today, your DC-7 cruises easily at speeds attained only by hot fighters fifteen years ago. By 1960 the airlines will have jets that top the best World War II fighter speeds by 100 miles an hour. Now we are shown this new fighter which covers four miles of ground every ten seconds. Fifteen years from now, in 1971, who can say?

It seems no time at all since 500 was the magic number, the impossible terminal velocity achieved in a screaming power dive. We boys who spent our afternoons at Bowman Field in Louisville in the late thirties thought

it made the old '26 look with its wing wires and open seat. It seemed to us that designers were fast approaching the limits of power and speed.

Next it was the Curtiss P-36, in 1939, and we knew they had done it again. Even more power and speed, though we noticed it used up more of the airport than earlier pursuits. A test pilot, diving a '36 straight down at full throttle, clocked over 550 and it was front-page news. In the air mags, experts were predicting 500 in level flight and few people really understood what it meant. Louisville to Baltimore in an hour—fantastic! Surely aviation was moving in tremendous strides.

Looking back is one way of looking (Continued on following page) ahead. We remember the planes of fifteen or twenty years ago and how advanced they seemed. Now we know they were but stepping stones to greater things. The performance figures that are so amazing today will likewise become commonplace with the years, and we may even live to smile at them in retrospect. Studying the past, we see the present in its proper perspective and so gain a glimpse of the future.

In our musings about yesterday and our wonderings about tomorrow, it is almost possible to forget the purpose behind most air achievement, the real meaning of it all. The F-104 represents fifty-three years of aviation progress. Half a century of trial and error, success and disappointment, sweat and work. Uncounted lives were lost in the over-all process of producing this fantastically complicated, enormously expensive machine which can move at 1,400 miles an hour. And its sole mission is death. It is a killer, as efficient and ruthless and devastating as science can make it.

Considering the state of world affairs, we need this killer and many more like it. Its supersonic climb and tremendous speed give us a slightly better chance of knocking down invading bombers, if they come. And these bombers must be knocked down, no matter what the cost, because we know the sort of destruction that will hang in their bomb racks. One man in one plane will flip one switch and release more destructive power than was dropped by all the aircraft that flew in World War II. The fact that we have built 1,400 miles an hour into a plane means something to our potential enemy. He may keep his bombers grounded because of it.

Since its birth the airplane has been a weapon to save us in war and preserve us in peace. But it is not a gun, effective only when used or when its use is threatened. We are so painfully aware of the damage it has done, and may do again, that we forget its constructive possibilities. It is easy to recognize the curse, hard to see the blessing.

blessing.

The high performance built into military death-dealers a few years ago has been handed down for peaceful use. The bomber capable of lifting a 12,000-pound blockbuster has led to the airliner with sixty seats; radar that showed the outline of a target now reveals the outline of a storm; radio developed for combat serves flying businessmen. We fly faster and farther and more safely because of ideas first

tried in warplanes.

And we fly more usefully. Few people, even in the aviation world, realize the amount and scope of work now being performed by aircraft and the profound effect it has on modern life. Aerial surveying is an example of little-known civil air activity. Two men in a plane at 25,000 feet can map more of the earth's surface in a day than a large ground team can cover in months. The photographs they make, when properly mounted and calibrated against known surface points, become invaluable tools for map makers, city planners, railroad and highway engineers and flood control officials. Forest service experts are able to measure snowfall and estimate fire damage, spot tree disease and count deer in inaccessible mountain regions. Oil and mineral information appears to the trained eve. Farmers study the effects of drought and erosion, observe results of new agricultural methods. Historians even use air photos to locate forgotten immigrant trails in the west.

A complete list of the peaceful chores now being completed in the air, and the many ways each contributes to our welfare, would require many pages. Most of this work could not be done as well without aircraft; much of it would have to be left undone. No one can calculate the overall value to civilization of the airplane when it is employed as a tool rather than a weapon.

The greatest worth of the airplane in peace may lie in its simple ability to move people from one place to another quickly. The present intercontinental tourist boom, brought on largely by the plane, reflects our curiosity about people in other countries and their interest in us. It is one thing to read about England or Japan and hear about them from those who have traveled and quite another thing to go there yourself. Hundreds of thousands of vacationists with limited time and money are taking trips to Europe and South America and Asia, seeing for themselves and meeting the local people-mainly because they can get there and back in a hurry. Businessmen from New York and Australia and India and Peru pass each other high above the seven seas as they complete their global rounds, buying, selling, and trading.

Certainly this is a step in the direction of mutual respect and understanding between nations. This vast and growing interchange of ordinary citizens cannot help but to dispel a bit of the doubt and suspicion with which we consider outsiders, and they us, and improve to some extent the international climate.

Air travel is becoming faster and cheaper, making it possible for even more to see the far parts of the world on business and pleasure, a most encouraging sign in this day of fear and tension. The airplane which has become the most dramatic weapon in history is proving itself a notable peacemaker and ambassador of good will. Perhaps this will be its greatest role.

LEN MORGAN

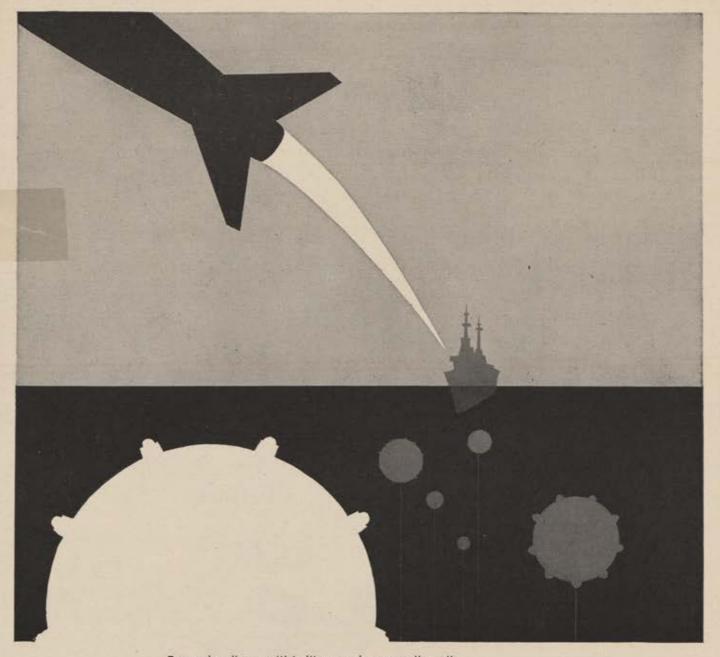
Let's Keep 'em Cornered

It's a rather foregone conclusion, at this stage of the cold war, that we are unable to repel a concentrated A-bomb attack upon our nation. True, we do possess the capability of destroying a certain percentage of the aggressor's fleet, but it is doubtful if we'd be able to stop more than fifty percent, except under ideal conditions. And we can rest assured that when an attack comes the conditions will be ideal for the attacker and not for us. Should fifty percent of a 500-bomber fleet

evade our defenses they would drop enough nuclear energy on us to put us out of business, or nearly so, for a considerable length of time. So with this grim conclusion firmly in mind let's take a look at this undesirable predicament from the other side of the Iron Curtain.

The strategic situation in Russia is far worse than it is in the United States. Not only do they have three times the area to defend as we do, but the Communists are very much aware that they cannot launch an A-bomb or H-bomb attack against the United States without first neutralizing the NATO air forces, the Royal Air Force in England, and the USAF combat organizations in Europe and Africa. We've got the Communists cornered in such a way that it would be necessary for them to destroy nearly all of the highly industralized world in order to achieve a Red victory. And even then victory would not be assured. With all of the NATO jet fighters possessing an A-bomb-carrying potential, and the range to put the bombs east of Mos-

(Continued on page 237)



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cow, it's not likely that the men in the Kremlin will risk all they've gained, with only a fifty-fifty chance of victory.

Since we are not capable of completely defending our nation against an all-out attack, what course of ac-tion should we follow to guarantee ourselves the best chance for survival? Some strategists advocate a fleet of 1,200 intercontinental bombers of the B-52 type. At eight million dollars each, the bill for 1,200 B-52s would be astronomical. At our present rate of technological advancement (and the enemy's too) the B-52s will be obsolete in another three years. Within a few short years the Intercontinental Ballistic Missile will come of age, then where will we find use for our B-52s? No, the B-52 bomber fleet is not the answer. A limited number yes, but not ten billion dollars' worth.

We have an advantage over the Soviets that we should exploit to the utmost. But to do so will require a change in our over-all strategy. Up till now our mass retaliation offense has been vested almost entirely in the Strategic Air Command's medium and heavy bombers. Our investment in SAC has paid off to date, but the scientific advances made by the enemy in the past few years has begun to negate the offensive power of our SAC bombers. Once the Soviets perfect their ICBM, our intercontinental bombers will be as outmoded as flintlock rifles. And according to reliable sources the Soviet's ICBM is in a high state of development. At an accelerated production rate it is unlikely that we could manufacture 1,200 B-52s before the perfection date of the Soviet ICBM. Should we invest ten billion dollars in a strategic concept that will be obsolete or obsolescent in a year or two? Yes, say the advocates of an intercontinental bomber. No, say those who know a more economical way.

In lieu of an ICBM to counter the Soviet's guided missile, we need an "interim" counterweapon that will discourage the aggressor from launching an attack. We must make his chance of victory so slim that he won't dare push the button that will start World War III. Our counterweapon, to offset the ICBM lead of the Soviets, could be a force of supersonic, radarequipped, two-place, all-weather, A-bomb-carrying fighters with a 2,000mile range. With a large force, say 1,200, of this type aircraft based within an hour's flight of Russian cities, it would make it plain to them that their chances of winning an A-war or H-war would be highly improbable.

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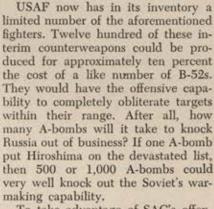


The Waterman PANELSCOPE is a custom-built cathode ray tube oscilloscope, with simplified operation, and yet available at a low price. The PANELSCOPE concept provides for the following:

- MINIATURIZATION Panel space required is only 5¼" x 5-3/16"
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- SIMPLICITY OF OPERATION Twist of a single rotary switch provides a synchronized pattern of desired incoming signal (up to 11 circuits) against proper linear time base. This is ideal for monitoring and trouble shooting, as it removes the need of fiddling with knobs as it is done now on general purpose oscilloscopes. The static controls, such as beam, focus, positioning, and graticule brightness are located in tube escutcheon.
- CUSTOM DESIGN A wide variety of signal amplifiers with response from dc to megacycles and sensitivities from 5 millivolts — synchronized or triggered linear time base generators from ½-cycle (and lower if need be) to 2 microseconds — can be specified by you to fit your needs for particular equipment.
- PARTIAL KIT FORM The PANELSCOPE comes fully wired and tested with chosen signal amplifier, linear time base generator and attendant sync. amplifier. The desired signal attenuators, frequency and amplitude determining components, and method of synchroniza-tion can be installed either by us or by you.
- POWER REQUIREMENT Less than 10 watts of line power for built-in high voltage supply The required B+ and heater current as selected by your requirements. For those cases where B+ and heater power is not available, auxiliary power pack can be supplied.

There is a place in your equipment for Waterman PANELSCOPE, a custom built oscilloscope at production prices, although your needs may be but one or two. May we have your requirements?



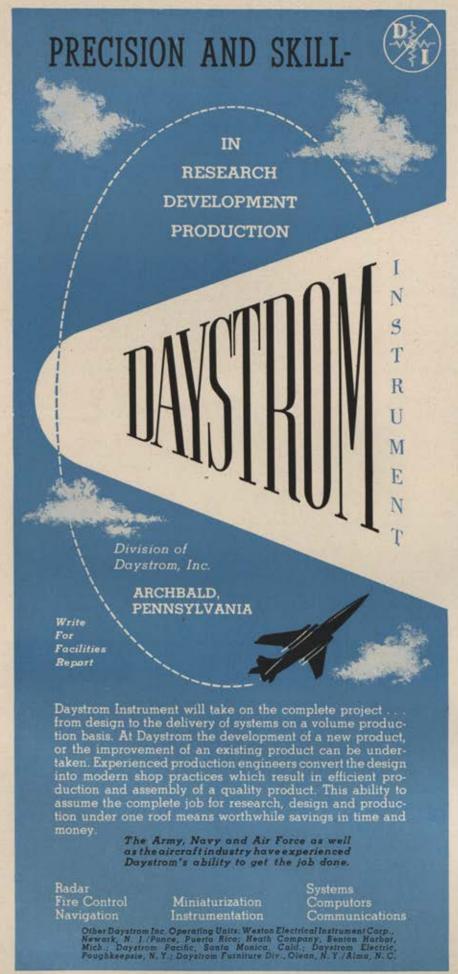


To take advantage of SAC's offensive experience and target information, this force would naturally come under its command. The transition of combat crews from the B-47 to the supersonic A-bomb fighter would be relatively simple. Maintenance of these aircraft would be infinitely easier because they only have two engines in comparison with the six-jet B-47 and eight-jet B-52. With the ability to operate at night and under all types of weather the A-bomb fighter could obliterate targets within its 2-000-mile range. The targets that it could hit could be destroyed by our B-47 medium bomber fleet and the B-52s in our stockpile of air weapons.

Advocates of the vast B-52 intercontinental bomber program say that basing A-bomb fighters in Europe would place them at a tactical disadvantage. To a degree it is true, but on the obverse side our Air Forces based in Europe have the advantage of a radar network that can detect an enemy thrust almost immediately. Properly dispersed, it is highly improbable that the Soviets could destroy more than one-half of our A-bomb fighters in Europe. The retaliatory effect of the remaining A-bomb fighters would be sufficient to immobilize and paralyze any further aggression.

With our present weapons becom-ing outmoded almost before they reach the tactical level, it is evident that any weapon we develop between now and the time we perfect our ICBM will be an interim weapon. And even the ICBM may not be the "ultimate weapon" that we believe it to be. But despite this fact we are faced with the economic problem of producing in-terim weapons that will deter Soviet aggression. A ten billion dollar B-52 program is entirely too much to invest in an interim weapon. We can do it for substantially less and if we are to survive we must keep that big bear at bay. Regardless of how it is done, let's keep 'em cornered!

Maj. David F. McCallister



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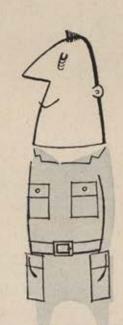
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The Man in the HERRINGBONE TWILL Suit



di.lem'ma (di.lem'a; dī), n. A choice, or a situation in which a person has to choose, between courses of action, methods, etc., no one of which seems to promise a favorable result; hence, any difficult choice or situation.—Syn. See Predicament.

rause today's AF (read also Army a

is losing its expensively trained technicians at a dangerously high rate. The man in the herringbone twill suit has discovered greener fields. Two recent headlines stated the problem and offered a possible fix. One declared, UNIFORMED AF STRENGTH SHOWS LOSS; the other, SKILLS PAY IDEA GETS SUPPORT.

Skewered on one sharp horn of the dilemma are slow initial enlistments and skidding re-up rates; on the other, a requirement to expand to 137 wings by 1957. For the statistically minded, the AF now has 914,000 officers and men. To man 137 wings, it had figured on 975,000. But budget barbers shaved 36,000 from that figure and put up only enough money to pay 939,000.

And propping open the door marked "OUT," checkbooks at the ready, stood contented ranks of employers ready and willing to pay the top dollar for AF-trained technicians. At an estimated training cost of \$15,000 for the garden variety technician (Maj. Gen. Frederic H. Smith, Jr. Commander, Fifth Air Force, Far East, in a letter to Representative Chet Holifield—D.—Calif.—noted that some technical training "... may be as high as \$75,000"), Mr. Employer knew a bargain when he saw one.

Equally keen at sniffing out a buck

is the AF technician himself—the man in the herringbone twill suit. It is a fact that a man willing to pay money for skills will come to agreement with a man with skill to sell. This is not because of greedy motives but be-

Top dollar for AF-trained technicians.



cause today's AF (read also, Army and Navy) is no longer largely a bachelor force, as it was prior to World War II. A married man must provide for his family.

This constitutes a dilemma. Is the answer to be found in SKILLS PAY IDEA GETS SUPPORT? Possibly, but I'd like to point out some reasons why such a plan requires careful study. Even on casual examination the questions come thick and fast. Who would get the "skill" pay? And possibly more important, who would not get it? What would be the criteria for paying it? Would it be a flat sum based on the job and paid regardless of the rank of the recipient? Who is a technician? Who is not? Would administrative workers, regardless of the intricacy of a job, be automatically barred from "spec" pay? Is it possible to raise the pay of some of the people some of the time without an across-the-board raise for all hands?

Let's proceed on the assumption that the skills pay idea is workable. How to make it work? As a first step, a complete reevaluation of every AF job will be necessary. Criteria established as recently as five years ago are now suspect. Certain fields, notably electronics, armament, airframe, and propulsion, have undergone tremendous changes.



Separate technicians from the NCOs.

In addition, a new look will have to be taken at the present NCO grade structure. The NCO must be separated from the technician. The traditional hierarchy of the military must be preserved but cognizance must be made of the vast numbers of technicians required to make the AF tick. That these technicians be paid according to the complexities of their jobs and their degree of skill is obvious. Also, technicians of certain level must be accorded the rights and privileges of NCOs-shipment of families, household goods, and automobiles at government expense; separate rations; membership in NCO clubs, and the like.

Under this plan the great majority of present-day AF NCOs would be converted to specialist ratings. During the conversion period there would be no loss in pay—a lateral movement, according to pay grade, would be made. Hand-picked men would be retained in NCO status. Later, after a shakedown period that might possibly last four years (four years because this is the minimum AF enlistment term), additional specialist grades could be created to provide for finer increment of pay adjustment in step with skill level required.

Where we now have seven enlisted pay grades, it is conceivable that ten or twelve or even more might eventually be required to accurately determine a fair pay schedule.

Two major objectives would be accomplished by conversion: (1) reduction of the number of NCOs in the AF with the accompanying opportunity to hand-pick men to retain NCO status, (2) creation of specialist grades would allow maximum promotion opportunities without saturating the AF with an over-population of sham NCOs.

The chief difference in the two categories would lie in "performance of work" and "supervision of work." The NCO would be the responsible foreman on the job. The specialist would be the worker. So that the NCO would be able to lead with authority he would first of all have to be a top-flight technician himself.

To move from specialist grade to NCO rank, certain courses would have to be taken and tests passed. A point of great importance, however, is that a technician need never try for NCO rank if not so inclined but could qualify for top pay because of his technical competence.

Specialists would be identified by distinctive insignia—not a chevron! Enough trouble has been caused by stripes for everyone.

As stated earlier, every job in the AF would have to be restudied and a skill value assigned in realistic degree. Thus, an organization such as a bomb squadron, employing the whole range of technical skills, would be able to promote and pay all of its technically competent people without making a chief of everyone

One of the great profits to be realized in converting the majority of NCOs to specialist grade would be the scalping of a goodly number of administrative mahatmas presently tormenting the man in the herringbone twill suit. The white-collar side has had its willful way too long with the nuts and bolts side.

Would conversion from NCO rank to specialist grade be acceptable to most airmen? Testing the reaction, as I have for the past several years, it can be summed up in one sentence: "I don't care what they call me, or what I have on my sleeve, just so I have a chance to hit top dollar."

Money, then, is one of the chief reasons why technicians leave the AF. This can be stated in another way—the inequal distribution of money, e.g., a staff sergeant clerk gets the same scale as a staff electronic maintenance man. The finer grading possible under a specialist ladder would go far toward eliminating this error.

There are other reenlistment lures available-let me sketch out a few. To stimulate reenlistment it would seem sensible to increase the present GI insurance from \$10,000 to \$25,000. Generous by World War I standards, \$10,000 pales into insignificance when contrasted with today's cost of living. In addition, the increased rate is justified by the value of the product insured. The \$25,000 policy could become effective after the man contracted for his second enlistment-for a first enlistment he'd be covered by the present \$10,000. Or, the value of the insurance could be increased in increments of \$5,000 per enlistment to a maximum of \$25,000.

With this kind of coverage a man would hesitate about tossing it aside. To make the game even more interesting, provisions could be written into the contract permitting a man to retain for life, coverage of, say, \$12,500 upon completion of twenty years, the full \$25,000 for thirty years.

The kitty to pay for this kind of insurance could come from the insured themselves. World War II GI insurance did very well-well enough to pay generous dividends—with only token payments by the insured. Twenty-five "Gs" is a thoughtful sum of money.

Foreign service, especially in undesirable regions, can be made into a re-up tool. Service papers speak of more money for service in such areas and this is worth considering, but there is still another bait—the reestablishment of "double-time" longevity credit for duty on tough stations.

If not full "double-time" credit, then bonus-time credit of certain degree could be established. While added money for foreign service is always welcome, "bonus-time," good for pay and retirement credit, would carry added weight when thoughts of reenlistment are entertained.

At this point it might be worth mentioning that a crisis of serious proportions is to be anticipated in about five years when almost the *entire* top of the non-com corps retires. "Bonustime" credit would help to stagger this loss over a wider period of time. It would also enable a man to earn thirty-year retirement pay for only twenty-five years of service; a man bent on retiring on twenty would be encouraged to continue for another enlistment.

Career airmen are inclined to do a slow burn whenever the GI Bill of Rights is discussed. Its provisions are so generous and well advertised it is almost impossible to resist taking advantage of them. "It's a shame to pass them up," might be the reaction.

With a little tinkering the Bill could be reworded to reserve rights for an indefinite time—as long as the man remains in the service. I have heard it suggested by more than one airman

(Continued on following page)

No bonus for the troops at Christmas.



that cash payments be made for certain rights, such as educational provisions, if the potential recipient elected to vacate his rights. Also, many men suggest that the educational privileges be assignable to a son or daughter.

This last might be the more practical solution—Junior goes to college on his old man's rights, provided Pop completes at least ten years' service. Along about Christmas time, when civilian firms and friends are joyously tallying up bonuses, a less happy mood pervades the AF. Wistfully, the troops ask if a bonus is possible for them. Is it? Maybe! Here's how. At the

Is it? Maybe! Here's how. At the present time, leave credit is accrued at the rate of thirty days per year. At the end of an enlistment all unused leave up to sixty days is paid off

in cash, along with final settlement of accounts. Since the typical airman is serving a four-year enlistment, he is shot down for sixty days (thirty days times four years equals one hundred and twenty days) if he does not take a furlough during his hitch.

By making accrued leave payable at the end of each year an annual (Continued on page 245)



Billy Mitchell's Feelings About the Man in the HBT Suit

In the winter of 1921 and 1922, Brig. Gen. Billy Mitchell, along with 1st Lt. Clayton Bissell and aeronautical engineer Alfred Verville, made an inspection trip to France, Italy, Germany, Holland, and England. On their return, General Mitchell prepared a report, one portion of which we reprint below. It was typical of General Mitchell that he went straight to the heart of the personnel problem, and noteworthy that his words are as true today as they were thirty-four years ago.

THE EDITORS

THE MOST difficult problem in the maintenance of an air force is the question of personnel. Most of the officers who have gone into aviation have been younger men who have had the dash and courage to carry on this work. They are the only ones that know how air forces should be handled and controlled, as they alone have had the actual experience in that particular arm. Most of these officers have come either from the older services, such as the army or navy, or from civil life, and are therefore junior in rank to the others—that is, to those of the army and navy, although in nearly all cases their commands in the air force are proportionately greater. They run more hazard in time of peace than the other troops do ordinarily in time of war, and have special conditions surrounding them which do not exist in the army or the navy.

The utmost interest and the greatest efficiency must be maintained among the air personnel in order to develop and advance aeronautics. This being the case, temporary rank should be given in accordance with the command of the officers' assignment, and he should be allowed a graded retirement in accordance with his length of service. Flying pay should be given on leave of absence, and, for the permanent personnel, conditions of living should be made

as attractive as possible.

As to the enlisted men, there should be two distinct classes. One, the mechanics' class, should be drawn from the best men available in the country for this purpose who have already had mechanical training in civil life. These should be paid a sufficient amount of money to make it an object for them to remain in the air service. This amount of money should vary from time to time in accordance with what mechanics get in civil life. The second class of men should be used for administrative purposes with the tactical units, such as doing fatigue work, cook and kitchen police, guard, and the cleaning of airplanes and equipment. This system is used in every country in Europe, and without it an efficient enlisted personnel cannot be maintained. It must be remembered that there are seventy-five trades which go into the make-up and maintenance of air equipment. Had we proper laws and methods for handling personnel in the United States, we are capable of developing the finest air personnel in the world, as proved by experience. With the present conditions, however, our mechanical personnel is becoming inefficient, and the casualties incident to aeronautical development are causing great inroads in our officer personnel.-END

NEW THIOKOL ROCKET MOTOR PLANT TO BE BUILT IN NORTHERN UTAH

12,000-acre
plant site acquired
for rocket motor
development center

Near the north shore of Utah's Great Salt Lake a new Thiokol plant will soon rise. This latest expansion by the Thiokol Chemical Corporation will bring to four the total number of Thiokol plants devoted exclusively to the development and production of solid propellant rocket motors.

Just 84 miles northwest of Salt Lake City, the new site is centrally located with regard to all major western cities. It is convenient to both rail and air transportation, yet sufficiently isolated to permit the testing of the largest rocket motors.

Thiokol chose this location in order to service the growing missile and rocket industry in the West. It will become Thiokol's western center for all guided missile engines and rocket motor development and production.

Engineers and Chemists – become a member of Thiokol's rocket development and manufacturing team. We welcome inquiries from mechanical engineers, chemical engineers and chemists interested in the rocket field.

If you would like more information about the Thiokol Chemical Corporation, write on your business letterhead for our booklet, "From Rubber to Rockets"—the story of Thiokol, as a synthetic rubber and rocket propellant pioneer.

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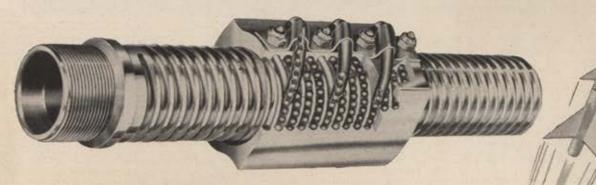
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SAGINAW b/b SCREWS

Will Solve Your Problem!



Saginaw engineers custom-design ball screw assemblies to move heavy loads with precision in limited space—even under extreme environments that are too tough for hydraulics, pneumatics or acme screws

ONLY SAGINAW HAS THE ENGI-NEERING ABILITIES, EXPERIENCE AND DESIGN FEATURES TO OVER-COME ALL THESE PROBLEMS:

LACK OF LUBRICATION



Even if lubrication fails or cannot originally be provided because of extreme temperatures or other problems, Saginaw b/b Screws will still operate with remarkable efficiency. Saginaw units have been designed, built and qualified for operation without any lubrication.

EXTREME TEMPERATURES



Normal operating range is from -75° to +275° F., but assemblies have been designed in selected materials which function efficiently as high as +900° F. These units are practical where hydraulic fluids have long since lost efficiency or reached their flash point, and cannot be employed.

PRECISE POSITIONING



Machine-ground Saginaw b/b Screws offer a great advantage over hydraulies or pneumatics because a component can be positioned at a predetermined point with hairbreadth precision. Tolerances on position are held within .0006*/ft. of travel.

POWER RESTRICTIONS



With guaranteed efficiency of 90%, Saginaw b/b Screws are up to 5 times as efficient as arms screws, require only 1/5 as much torque. This permits much smaller motors with far less drain on the electrical system. Less heat is generated; and circuitry is greatly simplified.

FAIL-SAFE PERFORMANCE



Far less vulnerable than hydraulies. In addition, Saginaw offers three significant advantages over other makes: (1) Gothic Arch grooves eliminate dirt sensitivity, increase ball life; (2) Yoke Deflectors and (3) Multiple Circuits provide added assurance against operating failure in critical applications.

SPACE/WEIGHT LIMITATIONS



Saginaw b/b Screws permit use of smaller motors and gear boxes; eliminate pumps, accumulators and piping required by bydraulies. In addition, Saginaw b/b Screws themselves are smaller and lighter. Units have been engineered from 1½ inches to 39½ feet in length.

REVOLUTIONARY BALL/BEARING SPLINE



Averages 40 times lower friction coefficient than sliding splines!

Can be designed for a wide variety of applications in many different sizes. Units have been engineered from ½ to 3½ in. in diameter, 3 in. to 9 ft. in length.

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bonus would be created—if not a full thirty days, at least a fraction thereof. In addition, the AF would be getting twelve months of work per year from most of its people. Some might say that all work and no play makes Jack a dull boy—in this case it would make jack, always a welcome addition, especially in our non-bachelor AF.

But above all, don't penalize a man two months' pay just because he was too conscientious to take off all the time coming to him. Pay him for every single day of accured leave. If it comes to 120, 150 or 180 days, pay the man; he worked the time and he earned the money.

Under discussion in various states are bonuses of another kind. Bonuses for service in Korea. Naturally, these developments are watched with a great deal of interest-as I am watching what is happening in Pennsylvania. A bonus is talked about, and is actually making its way upward through the legislative machinery but there is little joy in it for me. The Pennsylvania bonus carries the interesting provision that it would not be payable to Regulars-probably on the theory that such men are in the service on a business basis and were not too inconvenienced by the war.

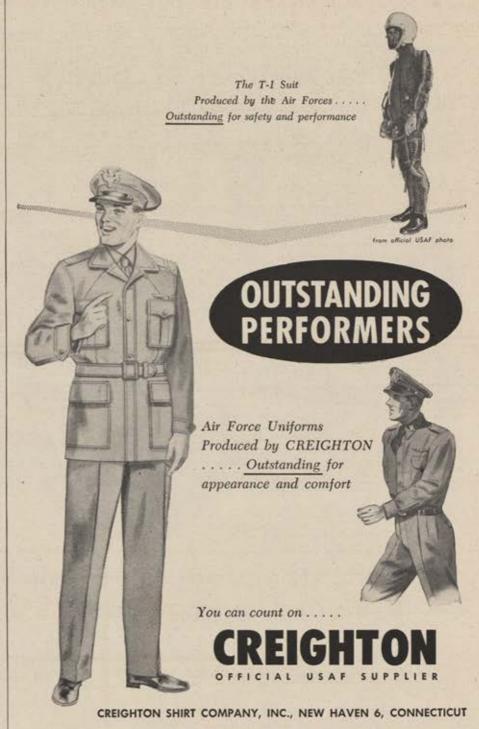
I realize that the AF cannot take official action in the affairs of the state of Pennsylvania but military associations can. Pennsylvania's action in discriminating against the Regular adds another barrier to thoughts of career military service.

As a stimulus to reenlistment, another look might be taken at the present re-up bonus system. This is the system that rewards long service with diminishing payments as the service increases. It is contrary to reason, to established practice in industry, has embittered old timers, and has not produced the result expected of it.

It has been said before but it will bear restatement—return some of the fringe benefits. PXs, commissaries, on-base-movies, in-club sale of liquor are included. Not only return them, but expand them. Troops are quick to point to industry and other organized groups which "fringe" their workers with cooperative buying schemes.

So much for the dollars and sense side of the re-up picture. There is another and quite important side—the human side.

Military housing, both for bachelors and married personnel, is generally sub-standard—in some cases it is downright primitive. Even though it will cost millions, the present "temporary" barracks and mess halls must be re-



placed by permanent, sanitary, and fireproof structures. That the "great fire" has not yet occurred is only the workings of good luck-barracks are wired for the experience of 1940 when the TV set, automatic washing machine and dryer, and all the rest were unheard of.

To ask a bachelor to reside for long in these dilapidated structures is too much. He is as hep as the next guy on the American standard of living.

As for dependent housing, much could be done in that direction. Why

couldn't a builder of the Levitt type contract to throw together one of his quick-mix towns? To the traditionalist such a suggestion might sound like the clap of doom—but the fact is, Levitt does build livable houses and he builds them fast, and he builds them cheaply.

On the human side is the cherished military virtue of esprit de corps. It doesn't exist anywhere but in combat crews and no sense kidding about it. It is absent because there is no such

(Continued on following page)



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The critical shortage of competent technical men needn't handicap your operation. Right now our creative engineers and precision manufacturing facilities are at your service for subassemblies or complete units of:

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- fine-pitch, instrument-type gear assemblies
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thing as permanence of organization. To quote a high-ranking AF officer, "... the identity of an outfit is subject to the regurgitations of the statistical corps."

He's right. Outfits which tested their wings in World War I no longer exist as operational units; old squadron insignia have largely disappeared.

No sooner does an outfit begin to accumulate some color and history than it changes its number and designation. If an outfit was originally designated, "1st Aero Squadron," for example, there is no good reason to modernize its title by rechristening it as the 1354th Fighter-Interceptor, All-Weather Squadron (Jet). The British understand this—they still have regiments bearing such titles as Fusilliers, Grenadiers, and Light Infantry, even though these outfits are just plain infantry.

People want to belong to something. In summary, I believe the re-up picture can be considerably brightened by:

- Return to a specialist-NCO airman structure with the great majority of airmen occupying specialist slots.
- Restudy of airman jobs with a view toward putting more accurate value on technical jobs.
- Elimination of NCO ranks from most administrative jobs.
 - Yearly payment of accrued leave.
 Double-time for longevity pay
- and retirement for tough stations.

 A re-up bonus which would increase as service increases.
 - A \$25,000 life insurance policy.
- The right to postpone or assign GI Bill rights.
 - · Restoration of fringe benefits.
 - Establishment of permanent outts.
- Modern quarters for bachelor and married AF people.

Certainly this is not a magic formula, but a formula nonetheless. The man in the herringbone twill suit is a reasonable man—the suggestions, I believe, are reasonable. Why not try some of them?—END

ABOUT THE AUTHOR

Sergeant Clifford's byline last appeared in Am Force in our June '55 issue ("Just a Second, Lieutenant"). A long-time Regular, who's been on AF-ROTC duty at the University of Pennsylvania and is up for an overseas tour this fall, Cliff is also the author of "School for Zebras," in our April '55 issue; "How to be an SOB," in January '55; "Dress Right!" in November '54; and "If I Were Running the AF" in September '54.

 $\frac{R}{P_{s}^{2}} = \left[\frac{(\sigma+1)^{\sigma+1}}{2^{\sigma} (2\sigma M^{2} - \delta + I)} \right]^{\frac{1}{2}}$

SERVOMECHANISMS

 $\alpha = \frac{NWf_*(M)}{5P_s} + f_*(M)$

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Tech Talk

The Lewis Unitary Plan Supersonic Wind Tunnel at NACA's Lewis Flight Propulsion Laboratory, Cleveland Airport, Ohio, has been completed and is now in full operation, following four years of construction work. The new tunnel can produce speeds up to 1,800 miles per hour and simulate altitudes up to 160,000 feet. Full-scale engines and components for highperformance aircraft and guided missiles can be tested and developed in the tunnel under supersonic, highaltitude conditions. The new tunnel is especially valuable for testing turbojet and ramjet engines.

The tunnel can be operated in a closed circuit, circulating the same air through the test section in a continuous flow, or it can be operated on an

bent or flexed by twenty-seven large jack screws, which take twenty-five minutes to move the twenty-ton wall from a maximum to a minimum opening. Engines or components as big as five feet in diameter can be accommodated in the ten-foot-square test section.

Seven electric motors developing 250,000 horsepower drive two compressors which handle about one ton of air per second. The air is passed through a large air dryer which removes a ton and a half of water every minute. Scientific data from the tunnel is processed through a special electronic data-reduction center adjacent to the tunnel, and the tests are monitored, by closed-circuit television, from the control room.

date full-scale aircraft parts which can be run through a spray equal to approximately eight inches of rainfall per hour. Poles are erected on each side of the track for 1,200 feet with nozzles on each directing a spray of carefully controlled "rainfall" across the track. This sled has, on three separate occasions, reached a speed of Mach 2 (1,560 mph), exceeding the speed record for rocket sled tracks. Twelve rockets boost the sled to Mach 2 within 3,800 feet of track, the sled passes through the spray, water brakes catch the sled at 8,000 feet and slow it to a stop near the end of the 10,000-foot track. The entire run takes about nine seconds but the sled is in the spray only a half second. With the volume of spray, however,





From left: Brig. Gen. J. S. Holtoner, Robert King, and Roy Holmes look over Convair's rain crosion test sled before its record 1,560 mph test run.

At left: Men in photo are almost dwarfed by huge blades on the main drive compressor that drives air through NACA's Lewis Wind Tunnel.

open-end run, exhausting the air through a large silencer. A twenty-four-foot diameter valve, weighing thirty-eight tons, can be opened when the tunnel is operated on the openend run. This arrangement permits full-scale testing of operational turbojet and ramjet engines at supersonic speeds up to a simulated altitude of 87,000 feet. Closed circuit aerodynamic test operations can reach speeds of Mach 3.5 and simulate altitudes of 160,000 feet.

The test section and nozzle of the tunnel are flexible steel walls ten feet wide, seventy-eight feet long, and one and three-eighths inches thick. The throat can be adjusted to change the airspeed through the test section while the tunnel is operating. Each wall is

The name "Unitary" stems from the legislation which provided for this tunnel and other facilities now under construction—the Unitary Plan Wind Tunnel Act.

Air Research and Development Command has developed a special rocket sled to test rain erosion on exposed aircraft and missile parts. Soft as rain is, it can damage radomes, plastic canopies, antennaes, and even metal skins if the airplane is flying at supersonic speeds on the order of Mach 2. The test sled was designed and constructed by Convair for ARDC's AF Flight Test Center to be used on their high-speed experimental track located in the Mojave Desert in California. The sled will accommo-

the run is equivalent to approximately 16,500 feet of one-inch rainfall at Mach 2.

Airborne tape recorders are being installed in all-weather interceptors to record operation of the airplane's fire-control system during an attack on a target. The tape recorder goes into action when the radar of the interceptor "locks-on" to the target, and records information taken from the airplane's radar equipment, translating it into signals representing position of the plane and target. After the mission, the recorder's tape is played back so that pilots and air crews can review the attack operation. The system is used for evaluation

(Continued on page 251)

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Flight Refueling maintains an extensive, well-qualified staff of field service technicians who assure satisfactory operation of FRI-designed and manufactured equipment throughout the world.



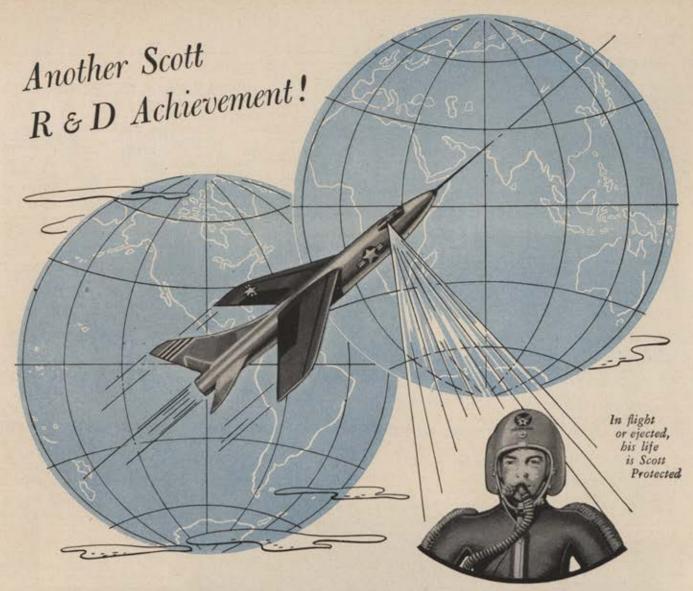
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Whether in flight or ejected, breathing protection is automatically maintained. In an emergency, aircraft main supply lines are disconnected automatically and the self-contained unit is actuated without human effort. Simplification is the keynote of this new Scott System. The usual maze of hoses and wires has been eliminated . . . with considerable weight saving.

For the shape of things to come, keep an eye on Scott R & D!

NOW READY FOR PRODUCTION

Scott has ever been cognizant of the importance of Applied Human Engineering. This new high altitude survival protection system is an example. It is past the experimental stage and is ready for production. Further information available to persons active in this field. Write for it today!



SCOTT AVIATION CORP.

8303 ERIE STREET LANCASTER, N.Y. Export Southern Oxygen Co., 15 West 57th Street, New York 19, N.Y. and training purposes, much like the gun camera training of World War II. The system, developed by the Autonetics Division of North American Aviation, is known as NADAR. More than 850 have been installed in North American F-86Ds and they will also be used in Northrop F-89Hs, Convair F-102As, and Lockheed F-94Cs.

A new magnetic material which promises to yield powerful permanent magnets is under study by Air Research and Development Command. The material was perfected as the result of a new and improved method for preparation of highly purified manganese-bismuth in powder form. The excellent magnetic properties of pure manganese-bismuth have been predicted for several years but until now the pure form could not be attained. Dr. Clarence Zener, Westinghouse Electric Corp., carried out the major portion of the research work.

The new method gives, on a laboratory scale, a very pure and highly magnetic form of manganese-bismuth, its greatest advantage being unusual resistance to demagnetization.

To produce the new material, manganese and bismuth are ground together under helium gas. (Helium keeps the manganese-bismuth powder from catching fire spontaneously, which it would do if it were exposed to air.) The powder is sealed in a glass vessel and heated to about 520 degrees Fahrenheit-the melting point of bismuth. The resulting product is then reground to a fine powder. Particles are imbedded in a plastic matrix and orientated in a powerful magnetic field and molded to shape. This method makes it possible to produce magnets in a variety of shapes and could result in a whole new assortment of magnets which may become as commonplace as the traditional bar or horseshoe magnets of today.

A unique bomb bay capsule has been developed by Boeing Airplane Co. for the B-52B and B-52C which will enable the Stratofortresses to perform multiple strategic missions. The capsule, looking much like a cylindrical boiler, is actually a fuselage within a fuselage. It is fully pressurized, air conditioned, and equipped with stations for a two-man crew. With such a capsule the B-52 is able to perform multi-purpose missions without major modifications. For instance, one capsule is equipped with four cameras for photo-reconnaissance missions while another contains electronic equipment and antenna for



A/2C Thomas Ferguson installs tape-recording NADAR unit in airplane (see text).



Interchangeable bomb bay capsules, designed by Boeing for the B-52B and B-52C, enables the bomber to perform multiple strategic roles.

electronic tasks. Heretofore, a separate airplane type, or modification of basic service types was needed for each specific mission. The capsule thus provides a more versatile airplane for the Strategic Air Command.

Hughes Aircraft Co. has a unique flying laboratory which is used to test the complete experimental electronic control system of the Convair F-102 all-weather jet interceptor. A mockup of the F-102 cockpit has been installed in the fuselage of a Convair T-29 which allows the pilot of the F-102 cockpit to fly the T-29 while using the interceptor's electronic control system. Control of the T-29 is not turned over to the F-102 test pilot until the airplane has reached test altitude. The electronic control system consists of a radar system, a computer and a scope, designed to "seek, find and kill" enemy aircraft. About two tons of equipment were installed in the T-29, some of which is test equipment used to monitor the experimental system. Components of the F-102 electronic control system are installed throughout the length of the T-29 fuselage where engineers and technicians can work on the various units while they are being "flown." Some of the units are easily replaced during the test flight to test experimental components for best results.

The Hughes electronic control system has three primary functions: it locates targets at long range, scanning the skies automatically, under all weather conditions. Once the target is located it directs the pilot to fly the most advantageous course to a point where it automatically launches the interceptor's missiles. The radar system automatically tracks a target and presents a signal to the pilot or radar observer on a small scope similar to a television screen. A computer receives the radar signals and converts the data into a signal which is also displayed on the scope to direct the pilot on an attack course.

Electronic control systems for various aircraft can be tested in the T-29. When such systems are installed they are experimental and must be squeezed or miniaturized into a production design that can fit in the small supersonic interceptors or fighters. Following the T-29 tests, the equipment is tested in the actual airplane for which it was designed (in this case the F-102), and then is put into final design and production. The T-29 flying laboratory produces a very large volume of test information with each flight and therefore accelerates the test program, and, more important, the electronic control system can be developed while the fighter or intercep-

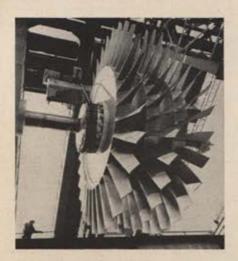
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Manganese-bismuth bursts into flame when exposed to air.

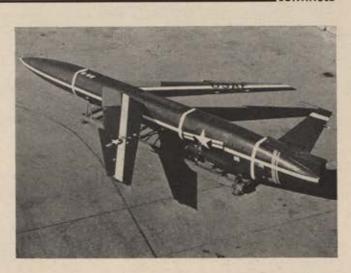


F-102 mock-up in a T-29 permits pilot to test fighter's electronic control system in flight,



Left—rotor for the world's largest compressor is lowered into position at the AF's Arnold Engineering Development Center in Tullahoma, Tenn.

The USAF's SM-62 Northrop Snark was placed on public display for the first time at Bolling AFB, Washington, D.C. in connection with the recent Armed Forces Day observance.



tor is still in the experimental stage.

The first North American F-100D Super Sabre produced by the company's Columbus, Ohio, plant has been successfully test flown. The "D" model is equipped with a Minneapolis-Honeywell autopilot, which controls the plane at supersonic speeds, enabling the pilot to concentrate on navigation or other tactical phases of his mission. The fighter is also equipped with a "probe and drogue" in-flight refueling system so that it can escort high-speed bombers on long missions. Like the "A" and "C" models the F-100D is powered by a Pratt & Whitney J-57 turbojet engine with afterburner.

A new high-altitude version of the Ryan Firebee jet drone missile will be built and flight-tested by Ryan Aeronautical Co. under contract with the Air Force. The contract calls for the XQ-2B Firebee to be capable of operating in excess of 50,000 feet and at high subsonic speeds. It will be a modified version of the now operational O-2A, incorporating a different jet engine, an improved control system and a high-altitude wing with increased area. Flight test of the first two XO-2Bs is scheduled to begin at ARDC's Holloman Air Development Center, Alamogordo, N. Mex., this

summer. The new drone will be used by the Air Force for target practice and evaluation of weapon systems.

Last month, Hall L. Hibbard, vice president of Lockheed Aircraft Corp., predicted that the wings of the F-104 would some day be adapted to commercial transports that will cruise at supersonic speeds. Mr. Hibbard made the prediction while pointing out that nearly all military inventions, excepting those of actual armament, eventually find their way into peacetime civilian use. A case in point is Lockheed's P-38 wing which found its way into civilian use as the wing of the Constellation airliner. Mr. Hibbard said the wing of the F-104 "came straight from a missile we have been flying for some time."

The Navy Department announced that it had awarded a contract to the Piasecki Aircraft Corp., Philadelphia, Penna., for an experimental vertical lift aeronautical development nicknamed the "Sea Bat." According to President Frank N. Piasecki, the "Sea Bat" will be unmanned and completely automatic in flight, controlled electronically from shipboard or land bases. Its compactness permits its operation from restricted areas aboard small ships or submarines, and it will be able to dart in any direction, hover

close to the sea's surface and return to its operational base completely controlled.

An engineer wearing a heat-protective suit, has walked into an industrial furnace heated to 1,200 degrees Fahrenheit. He carried an armload of wood that promptly burst into flames and burned as he stood in the heat. A half-inch-thick steak he held on another trip into the furnace cooked medium-rare in less than two minutes. The engineer, D. J. Bennett, was demonstrating a new aluminum-coated suit developed by the Minnesota Mining & Manufacturing Co., St. Paul, Minn., which lets workmen and engineers move freely in hot areas. Protective clothing like this can be used by steel workers, fire fighters, and furnace repairmen. The engineer stayed in the furnace for three minutes during one of his demonstrations.

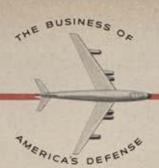
Science is seeking a way to eliminate the tell-tale vapor trails of jet airplanes. The Air Force has contracted with the Armour Research Foundation of the Illinois Institute of Technology, Chicago, Ill., to develop a method to suppress the visibility of vapor trails from the wake of high-flying jets. Contrails, visible at great distances, make surprise air attacks impossible.—End

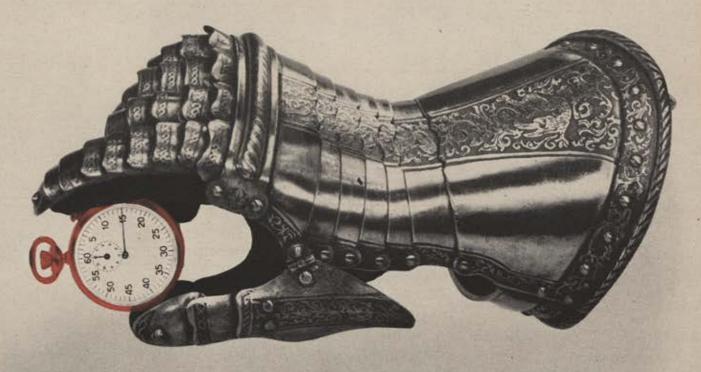


Left—a center section frame for a fighter-bomber, one of the largest single-piece forgings ever made, is examined by Nils Lou of the Republic Aviation Corp.

The Douglas C-133A first flew April 23. In one month it flew ten times, logged thirty flying hours, and lifted a gross weight of 255,000 pounds.







HOW FAST CAN AMERICA STRIKE BACK?

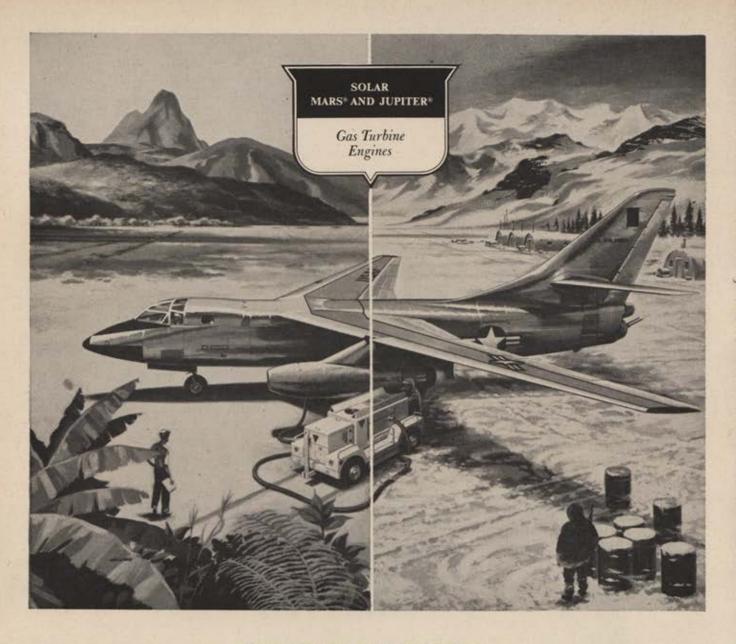
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ARDC shows off its wares

Rocket Sled and Matador's Debut

By Robert C. Strobell



The SMART (Supersonic Military Air Research Track) firing which I witnessed was the third in a series of ten tests designed to determine the structural limitations of the North American F-86 seat-ejection system in the transonic region. The sled was placed on the track at a predetermined point, and following range clearance and count down, it was fired. Surging down the track, it jettisoned the seat and then entered a deceleration sequence, starting with the firing of reverse-firing rockets and coming to a dead stop at the end of a mechanical arrestor system. In this run the sled completed the test, from start to stop, in about seven seconds, covering more than 3,000 feet of track and reaching a maximum speed of 612 miles per

Experimental rocket sled tracks are no doubt the most valuable tools at present for evaluating escape systems of high-performance aircraft. The 12,-000-foot SMART track, located in southwest Utah on top of Hurricane Mesa, was built and is operated by the Coleman Engineering Co., Los Angeles, Calif., under contract with ARDC. It is a unique track because one end, called the "muzzle," ends at the brink of a 1,000-foot precipice. Ejection seats are hurled into space at the end of the track where the complete cycle of escape can be studied. The sled itself is constructed in two sections, fastened together. One is the test section and the other is the pusher vehicle. Both sections ride the track on "slippers," which grip the rails. The test vehicle is large enough to accommodate a full-size operational ejection seat, life-size dummy, and parachutes



complete with instrumentation. The pusher section, powered by a battery of rockets, also has reverse-firing rockets mounted on the sides facing forward to slow the sled's forward speed at the end of the test run.

The track is constructed of crane rails, welded into two continuous 12,000-foot lengths, spaced fifty-six inches apart and laid on concrete with its foundation in bedrock. Controls and instrumentation consist of the usual telemetering equipment, camera stations, oscillographs, and tape recorders to provide vast amounts of data on each test run. The first test run at Project SMART was made on July 8, 1955. Tests have been conducted at supersonic speeds and the track is designed to reach speeds of Mach 2. Downward ejection seats, such as those used in the F-104 and B-47, can be tested on this track because of its unique feature of hurling test equipment through space to complete the cycle of emergency escape.

Armed Forces
Day crowd at
Patrick AFB,
Fla., saw the
first public
launching of
a Martin
TM-61 Matador
missile.



Top left—Rocket sled containing ejection seat and dummy is accelerated to high test speed by powerful JATO-type rockets.

Above—One second after seat and dummy are ejected, reverse firing rockets, spouting flame, reduce the forward speed of the sled for safe mechanical stop.

Left—Hurricane Mesa in Utah, site of the 12,000-foot track.

During the same week, at Patrick AFB, Fla., I was in the crowd of 20,000 who were invited to witness the first public launching of a Martin TM-61 Matador guided missile as part of the Armed Forces Day program. Launched by ARDC's AF Missile Test Center, the tactical missile served the dual purpose of making its first public debut while carrying out a routine test. Following the usual coordination flares, range clearance, and count down, the RATO bottle under the missile was fired, and the Matador blasted off its zero-length launcher in a cloud of smoke and dust. Two and one-half seconds later it was over the ocean, closely followed by a North American F-86 chase plane. Both missile and plane, streaming marker smoke, disappeared in climbing flight on their down-range mission. It was a routine launching as far as the missile crew was concerned, but to the crowd lining the fence it was a spectacular sight.-END



3

Hap Arnold

It's Still His

HE KEY to the role of Gen.
Henry H. Arnold in World War II
was a basic character trait, egoism
fortunately.

By this is not meant conceit, nor the flare for the dramatic he undeniably had. His egoism was a supreme selfconfidence that enabled him to overcome obstacles that others wouldn't have attempted.

Unlike many of the great leaders of the war, he never commanded in actual combat, not even his own plane. But he won many battles. History may well record that he personally changed the course of the conflict.

Before his Air Force (the possessive is used advisedly) could win its victories in Europe and the Pacific, he had to win a series of battles here at home.

He was only a medium-sized potato at the level on which they were fought, a mere three- or four-star Deputy Chief of Staff. That's where his egoism came in. Had he not felt destiny's impelling hand on his shoulder, he never could have held his own in the councils of war, much less have prevailed.

After the war, the Strategic Bombing Survey declared airpower was the "decisive" factor in Europe, and assured "eventual victory" in the war against Japan. Today, the primacy of airpower is a national defense policy.

But to know before the war that airpower would be decisive and assure victory, and not lose faith when the Luftwaffe failed to blitz England in 1940, and the strategic bombing plan threatened to collapse four years later—that called for a sense of infallibility only an egoist could possess.

The first of these battles occurred before the United States was at war. It sounds ridiculous now, but there was a question as to whether we should have an air force at all. Some cabinet members believed we should stick to the "Arsenal of Democracy" line drawn by President Roosevelt, and send all our planes to Europe, mainly to the British. If we got involved in the war, it was suggested, we should supply replacement units to the Royal Air Force.

With eloquent obstinacy, General Arnold argued that planes had to have pilots, gunners, ground crews, air fields, and a long line of supply. If we became involved in the war, our Air Force would greatly exceed the RAF. Why should the tail wag the dog?

He had to convince both Gen. George C. Marshall and the President in order to win out, but he did. The decision laid the groundwork for his Air Force.

The second battle, sometimes called a difference of policy, was with the British over our concept of daylight precision bombing. In 1942, a high-ranking RAF mission came over for the purpose of persuading us to shift production from day to night bombers. The RAF was sincerely convinced that daylight bombing could not be sustained at the price the Nazis were ex-

Dayton, Ohio, 1911—25-year-old Lt. H. H. Arnold in a Type B two-seater.

acting. To prove it, they brought secret tables of the prohibitive losses inflicted on the Nazis during the 1940 blitz, and by the Nazis on the RAF during daylight raids since.

To counter these figures compiled by the RAF from bitter experience, Arnold had only an adamant conviction. The blitz he discounted. The Luftwaffe was not designed for it, but nevertheless could have succeeded had it concentrated on targets and the RAF first, instead of bombing cities to break British morale before it had gained air supremacy.

To the statistics on RAF daylight bombing losses, Arnold pointed out the *Luftwaffe* had not met the B-17 and B-24 yet. But finally, he argued, night bombing could terrorize the German people alone, but could not knock out German industry. That would take daylight precision bombing on a huge scale.

Such a mistake in judgment could be far-reaching if not fatal. The Russians were hard-pressed, The demand for a second front was growing. The air offensive Arnold proposed would take a year of preparation. Then if it should fail, production of the B-17s and B-24s would have to be halted while they were redesigned for night bombing.

One man's opinion against timetested experience. Yet Arnold never hesitated to stake the nation's future on his lone conviction. Moreover, he convinced General Marshall and the combined chiefs of staff he was right. Shaking its collective head, the RAF mission returned to London.

On the first short-range missions, the B-17s and B-24s scored notable successes. However, as the raids lengthened, the Nazis developed a more effective interceptor system that took an increasing toll whenever the bombers got beyond the range of their fighter escort.

Air Force

By Ben Pearse

Then in August 1943, the Luftwaffe brought out its twin-engined, rocket-firing fighters. During one raid on the ball-bearing plants in the Schweinfurt-Regensburg area, they shot down sixty-nine of our bombers in one day, a loss of about twenty-five percent.

No air force can sustain losses of twenty-five percent for very long, Another raid in the same area a few weeks later brought a similar result. Plainly the B-17s and B-24s would either have to have fighter escorts, or resort to night bombing. Since no fighters had the fuel capacity for the range required by strategic bombing, the alternative seemed obvious.

It was obvious to everyone but Arnold. But he was convinced that daylight bombing had to continue to win the war. With the supreme faith of a small boy writing to Santa Claus, he dictated a memorandum that ran something like this:

"TO: Office of Operations, Commitments and Requirements, USAAF.

"Within six months, I want a fighter with sufficient range to escort bombers to Berlin and back. It can be an entirely new plane or a modification of an existing type."

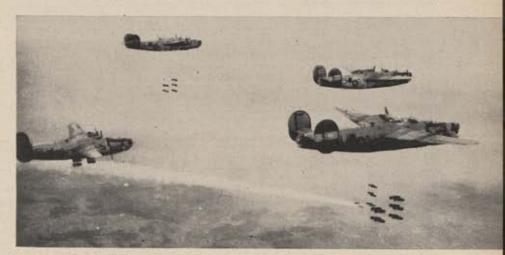
ARNOLD

Everyone who read it knew our fighters already had all the range possible built into them without sacrificing speed, maneuverability, or fire-power. Now, without cutting any of these, the range had to be doubled. Not an officer on the staff thought of telling the Old Man it was impossible. He would merely pound his desk, jut out his jaw, and say, "If you can't do it, I'll do it myself." And that would be the end of it. So they called in the engineers of North American Aviation, makers of the P-51 Mustang—our most economical fighter (Continued on following page)

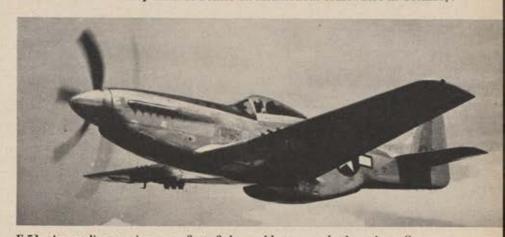
AIR FORCE Magazine • August 1956



B-17s bomb European targets. Arnold's faith in day raids couldn't be swayed.



B-24s of the 8th AF drop loads of bombs on installations somewhere in Germany.



F-51. An earlier version was first fighter able to reach deep into Germany.

Except for General Arnold, the B-29 might not have flown during World War II.





Can you spot Lt. Nathan Twining and Lt. Col. H. H. Arnold in this 1934 photo? Twining is third from right in front; Arnold is fifth from left in back row.

on gas-and started work on their three-dimensional jigsaw puzzle.

They moved a gadget here, another there, squeezed, fitted, figured, shook their heads, and fitted again. At last they created a space behind the cockpit big enough for an eighty-five-gallon gas tank. The added weight there worsened the flying characteristics, But if the fuel in that tank were used up first, she would handle normally by the time combat maneuvers were called for.

Arnold got his "impossible" fighter with range enough to fly to Berlin and back to its British bases, and within six months. In a series of air battles in February 1944, the Eighth Air Force broke the *Luftwaffe's* back and then flew where and when it pleased.

flew where and when it pleased.

Daylight bombing still had to provide the knockout punch. The ballbearing industry, a key to airplane production, was bombed time and again. Yet more planes were turned out in 1944 than two years before. Bombed-out steel plants somehow got along on stockpiles. But there was one industry that couldn't stockpile because there was no safe place to put the end product—oil. Without changing the basic strategy, the targets were changed. The Luftwaffe's gas tanks soon ran dry.

This vindication of his daylight

bombing strategy might have given Arnold huge satisfaction but for another battle, this time within the Air Force. It concerned a new plane the B-29,

Everybody agreed that the B-29 was a wonderful idea—for the next war. Besides the bugs inevitable in any new plane, there were details such as lengthening runways and building new ones in out-of-the-way places. But mostly it was engine trouble. Loaded with the tank-car of gasoline needed for each mission, no four engines on earth would lift it off the ground.

But for Arnold, the B-29 might never have flown during World War II. For all who threw up their hands, he had a stock answer: B-17s and B-24s can't cope with the distances on the approaches to Japan proper—we must have the B-29. He argued, wheedled, stormed, ordered, and pounded the table. And he got a new engine that would lift the B-29 off the ground. One night in June 1944, a whole flight of them flew across most of China and the China Sea to bomb Kyushu, the beginning of the end of Japan.

How did he operate? What was this strange power he wielded? One of the "victims" of his technique, a colonel in charge of aircraft warning units at the time, explains it this way:



General Spaatz presents the Legion of Merit to retired General Arnold.



Arnold, Spaatz, and Vandenberg at a ceremony in Luxembourg, April '45.

"A few days after Pearl Harbor, General Arnold called me in and asked how many battalions it would take to man certain islands between Hawaii and Australia, and when they could sail. After a little mental arithmetic, I estimated it would take four battalions, and that the first would be ready in about six months.

"The General looked at me as though I must have misunderstood and said, 'You don't seem to realize, Colonel, that the house is on fire. You haven't time to get out your mail order catalogue and order a hose!'

"Reaching for the squawk box, he buzzed personnel. 'Set up space for four aircraft warning battalions to sail from San Francisco in thirty days,' he said. 'Colonel —— is on his way down to tell you what he will need.'

"Still muttering to myself, I went down to personnel to try to wangle more time. The equipment was still experimental. We had only two battalions in the whole Air Force at that time, and they were at about the same stage of training as the men on duty the morning of the Jap attack. Four battalions in thirty days? Impossible!

battalions in thirty days? Impossible!
"How much sympathy did I get?
Well, my dog looks at me when I talk
to him. This personnel guy, an old
friend too, just said, "The General said

(Continued on page 261)

ABOUT THE AUTHOR

Benjamin H. Pearse was born in Omaha, raised in Milwaukee, and graduated from the University of Wisconsin (B.A., '24). A World War II contributor to this magazine (he was an ATC major), he reappeared on our pages last February. He has worked for the Milwaukee Journal, the San Antonio Express, and the Washington Evening Star, and has had bylines in the Saturday Evening Post, Coronet, and other magazines and newspapers.



Gen. H. H. Arnold turns over Army Air Forces to Gen. Carl A. Spaatz.



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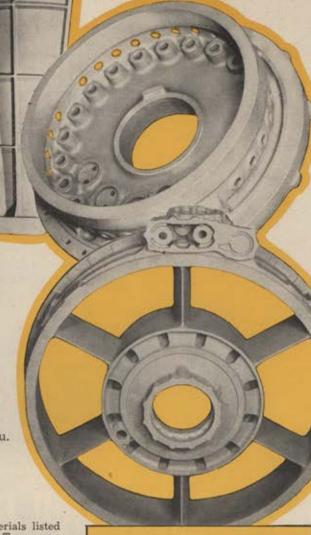
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HAP ARNOLD____CONTINUED

thirty days,' and continued his work.

"Thirty days it was. That experimental equipment suddenly became permanent, went into production the same day. We had enough for four battalions aboard when the boat sailed. We yanked electronics professors out of their classrooms and radar technicians out of factory labs. They trained on the boat. They learned how to set up a warning station by setting one up, and trained spotting planes with live Jap Zeroes for bait.

"They did a bang-up job, too, including some fine work leading up to the Coral Sea battle. But if it hadn't been for General Arnold, I doubt they would have been there. I would have told anybody else it couldn't be done, and believed it. But not him."

Come presidents, prime ministers, generals, admirals, or the enemy, his almost messianic faith in the potential of airpower furnished the drive to overcome all obstacles. Only an egoist can maintain successfully that everybody is out of step but himself.

When he left the Pentagon ten years ago, and retired to the shade of a live oak tree on his California ranch, he took with him a photograph of a friend with the following inscription:

"To General H. H. Arnold-who made it possible to win the war."

The signature was that of his closest military associate, whose experience would qualify him as an expert in such matters—Carl A. Spaatz.

But Hap Arnold at the peak of his career was still thinking ahead. In the closing months of the war, when the end was only a matter of time, he called his staff together and told them in brief:

"The pilot will not always be the key to airpower. For the present, yes. For the immediate future, yes. But even now mechanical gadgets are fast encroaching on the pilot's domain. We are entering the era of the guided missile.

"Someday, perhaps in our time, the man holding my job will meet here with a staff of scientists, and they will wear no pilot's wings on their chests. That insignia will cease to be the yardstick of Air Force achievement. That's something for you to think about."

Today's newspapers tell how much those he left behind have thought about it. So, in a way, it's still his Air Force, molded by his boundless energy and stamped with his imagination. And if there's something of egoism in it, that's part of his legacy, too, not conceit but a supreme self-confidence in airpower as the nation's first line of defense—fortunately.—End



The most important objectives of the world today are not those of war, but of peace.

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Col. Byron Switzer, Inspector General at AF-ROTC Hq., gives Medal to Cadet Col. David A. Townsend at Willamette.



Gen. Mark W. Clark, president of The Citadel, Charleston, S. C., presents the AFA Medal to Cadet Ogden Stokes.



AFA member Thurman J. Fleek, Jr., pins AFA Silver Medal on Cadet Lt. Col. Donald M. Blue at Butler Univ.



Dr. Howard C. Case, President of Boston University, pins the AFA Silver Medal on Cadet Peter P. Cye.



At Tulane University, AFA's Clyde Hailes congratulates the Silver Medal winner, Cadet Peter L. Mullins.



USAF Brig. Gen. Turner C. Rogers presents Silver Medal to Cadet Irven Shuman at Arizona State College.

* ROTC AWARD WINNERS *

BESIDES providing basic military knowledge, AF-ROTC programs help develop student character traits. This effort is furthered by the Air Force Association, which annually presents the AFA Silver Medal to

outstanding cadets in the AF-ROTC program at the various schools. The past school year, some 100,000 cadets were in the AF-ROTC at the 188 colleges and universities that conduct the program. The top men among

them, selected by their Professors of Air Science on the basis of scholarship, leadership, initiative, military bearing, resourcefulness and neatness, won the AFA Silver Medal.

(Continued on page 265)



North Carolina A&T's Cadet Capt. Alonzo J. Rue, Jr., receives medal from Col. Audley McDonald, AF-ROTC Hq.



J. D. Wohlford of AFA'S Ohio Wing pins Medal on Cadet Lt. Col. David S. Schreiner at University of Akron.



Col. Walter K. Shayler, PAS at Central Washington College, presents Medal to Cadet Col. Larry L. Pinnt.



Dr. Shannon McCune, Provost of the University of Massachusetts, congratulates Cadet Jonathan H. Snead.



Lt. Col. Harry J. Jenkins, member of AFA's Ozark Squadron, gives Medal to Cadet Larry K. Barton at Missouri U.



Walt Savage, D.C. Wing Commander of AFA, gives Medal to Cadet Lt. Col. James Swisher of George Washington.

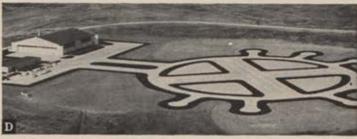
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This Year's Leaders

Since the AFA Silver Medal award was inaugurated in 1948, more than 1,000 cadets—representing the cream of the AF-ROTC crop during these years—have received this coveted award. Generally, the medals are presented in military ceremonies on Awards Day at the campuses of the various colleges and universities. In many cases (see cuts) the actual presentation is made by local leaders

of the Air Force Association. In other cases school officials or the Professor of Air Science makes the presentation. In any event, on most of the campuses in the land the AFA Silver Medal has come to be considered the top honor an AF-ROTC cadet can win. Below, and on the following page, are listed the names of as many of this year's Silver Medal winners, with the names of their schools, as had been reported to Air Force Magazine by presstime. —End



In award ceremony at the University of Oregon, Cadet Kent C. Dorwin is the recipient of AFA Silver Medal.

Alabama Polytechnic Institute, Auburn, Ala, Cadet Floyd B. Stroup.

Allegheny College, Meadville, Penna. Cadet Maj. Albert Williams Foley.

Amherst College, Amherst, Mass. Cadet Lt. Col. Frederick M. Smith,

Arizona State College, Tempe, Ariz. Cadet M/Sgt. Irven Shuman.

Boston University, Boston, Mass. Cadet Peter P. Cye.

Brigham Young University, Provo, Utah. Cadet Donald L. Rogers.

Brooklyn College, Brooklyn, N. Y. Cadet Paul H. Scheerer.

Brown University, Providence, R. I. Cadet Lt, Col. James W. Jackson.

Butler University, Indianapolis, Ind. Cadet Lt. Col. Donald M. Blue.

California Institute of Technology, Pasadena, Calif. Cadet Paul O. Lindfors.

Case Institute of Technology, Cleveland, Ohio. Cadet 1st Lt. William K. Fullerton.

Catholic University of America, Washington, D. C. Cadet Col. Thomas J. Anessi.

Central Washington College of Education, Ellensburg, Wash. Cadet Col. Larry L. Pinnt.

The Citadel, Charleston, S. C. Cadet Ogden Stokes.

Clemson Agricultural College, Clemson, S. C. Cadet Lt. Col. James F. Humphries.

Coe College, Cedar Rapids, Iowa. Cadet Capt. Leslie G. Edmonds. College of Puget Sound, Tacoma, Wash. Cadet Lt. Col. Charles L. Preuss.

College of St. Thomas, St. Paul, Minn. Cadet Lt. Gerald T. Olsen.

Colorado A & M College, Fort Collins, Colo. Cadet William E. Davidson.

Columbia University, New York, N. Y. Cadet Ernest D. Cunningham.

Cornell University, Ithaca, N. Y. Cadet Charles Arthur Kenyon, Jr.

Davis and Elkins College, Elkins, W. Va. Cadet Lt. Col. John E. Omps.

Drake University, Des Moines, Iowa. Cadet Maj. Jon D. Hill,

Duke University, Durham, N. C. Cadet Col. David D. Hartman.

East Carolina College, Greenville, N. C. Cadet Maj. Furney Powell.

Emory University, Emory University, Ga. Cadet Col. William C. Cromwell.

Florida State University, Tallahassee, Fla. Cadet Paul L. Grimmig.

Fordham University, New York, N. Y. Cadet Adrian A. Dolinsky.

Franklin & Marshall College, Lancaster, Penna, Cadet Col. Richard L. Postles.

Georgetown University, Washington, D. C. Cadet Col. Neal A. Long.

George Washington University, Washington, D. C. Cadet Lieutenant Colonel James E. Swisher. Georgia Institute of Technology, Atlanta, Ga. Cadet Harry A. Ecker.

Grinnell College, Grinnell, Iowa. Cadet Maj. Richard A. Wagner.

Harvard University, Cambridge, Mass. Cadet Edward P. Williams.

Howard University, Washington, D. C. Cadet Maj. Morris P. Bratt.

Illinois Institute of Technology, Chicago, Ill. Cadet Lt. Col. Lou Rubenstein.

Indiana University, Bloomington, Ind. Cadet Lt. Col. Laurence L. Powell.

Iowa State College of A & M Arts, Ames, Iowa. Cadet Lt. Col. Louis E. Eversmeyer.

Kansas State College, Manhattan, Kans. Cadet Donald V. Upson.

Kent State University, Kent, Ohio. Cadet Col. Donald L. Gindlesberger.

Lehigh University, Bethlehem, Penna. Cadet Daniel P. Cannon.

Louisiana Polytechnic Institute, Ruston, La. Cadet Walter Stagg.

Lowell Technological Institute, Lowell, Mass. Cadet Col. Chester J. Petkiewicz.

Manhattan College, Riverdale, N. Y. Cadet Col. George M. Murphy.

Massachusetts Institute of Technology, Cambridge, Mass. Cadet Lt. Col. Paul Polishuk.

Michigan College of Mining & Technology, Houghton, Mich. Cadet Lt. Col. Peter A. Taucher.

Montana State College, Bozeman, Mont. Cadet Dennis L. Lawden.

Newark College of Engineering, Newark, N. J. Cadet Lt. Col. John Nardone,

New York University, New York, N. Y. Cadet Lt. Col. Louis W. Diamant, Cadet Maj. Donald W. O'Leary.

North Dakota Agricultural College, Fargo, N. D. Cadet Maj. John S. Larum.

North Carolina College of Agriculture & Engineering, Raleigh, N. C. Cadet Lt. Col. John Johnson.

North Carolina College of Agriculture & Technology, Greensboro, N. C. Cadet Capt. Alonzo J. Rue, Jr.

Northwestern University, Evanston, Ill. Cadet Maj. Richard C. Culberson.

Ohio State University, Columbus, Ohio. Cadet Col. Richard T. Goetz.

Ohio University, Athens, Ohio. Cadet James E. Hamer.

Ohio Wesleyan University, Delaware, Ohio, Cadet Robert W. Wixon.

Oregon State College, Corvallis, Ore. Cadet Lt. Col. Duane W. Fisher.

Parks College of St. Louis University, E. St. Louis, Ill. Cadet Maj. Robert E. Seh.

Princeton University, Princeton, N. J. Cadet Lt. Col. A. R. Demar.

Purdue University, Lafayette, Ind. Cadet William G. Reinecke.

Queens College, Flushing, N. Y. Cadet Michael Beer,



Cadet Col. Chester J. Petkiewicz, Lowell Tech winner of Silver Medal, with the queen of the Military Ball.



Duke University President A. Hollis Edens presents the AFA Silver Medal to Cadet Colonel David D. Hartman.



Col. Earl R. Tash, PAS at University of Virginia, presents AFA Silver Medal to winning cadet, Albert J. Cox.

Rensselaer Polytechnic Institute, Troy, N. Y. Cadet M/Sgt. James E. Duggan.

Rutgers University, New Brunswick, N. J. Cadet Lt. Col. Brandes H. Smith.

St. Joseph's College, Philadelphia, Penna. Cadet Col. Conal Brady.

St. Louis University, St. Louis, Mo. Cadet Lt. Col. Thomas J. Eigel.

St. Olaf, Northfield, Minn. Cadet William G. Weitkamp.

San Jose State College, San Jose, Calif. Cadet Col. Renaldo D. Salvador.

South Dakota State College of A & M A, Brookings, S. D. Cadet Arnold Gene Dolejsi.

Southern Illinois University, Carbondale, Ill. Cadet Maj. Robert H. Martin.

Southern Methodist University, Dallas, Tex. Cadet James R. Smith.

Southwestern Louisiana Institute, Lafayette, La. Cadet Maj. Patrick Calais.

Southwest Texas State Teachers College, San Marcos, Tex. Cadet Manley W. Crider, Jr.

Stevens Institute of Technology, Hoboken, N. J. Cadet Henry W. Morriss.

Tennessee Agricultural & Industrial State University, Nashville, Tenn. Cadet Maj. James E. Armstrong.

Trinity College, Hartford, Conn. Cadet Col. Richard G. Abbott.

Tulane University, New Orleans, La. Cadet Peter L. Mullins. Tuskegee Institute, Tuskegee Institute, Ala. Cadet Capt. Eddie L. Harris.

Union College & University, Schenectady, N. Y. Cadet Col. John P. MacMahon.

University of Akron, Akron, Ohio. Cadet Lt. Col. David S. Schreiner.

University of Alabama, University, Ala. Cadet Harold E. Shepherd.

University of Arizona, Tucson, Ariz. Cadet Lt. Col. John F. Whitney.

University of Buffalo, Buffalo, N. Y. Cadet Col. Frank R. Wink.

University of Cincinnati, Cincinnati, Ohio. Cadet Col. Robert D. Essex.

University of Connecticut, Storrs, Conn. Cadet Maj. Joseph A. Ribando.

University of Detroit, Detroit, Mich. Cadet Lt. Col. William O. Styles.

University of Florida, Gainesville, Fla. Cadet Col. Joseph P. Stine.

University of Idaho, Moscow, Idaho. Cadet Lt. Col. Robert P. Speedy.

University of Illinois, Champaign-Urbana, Ill. Cadet Alexander W. Booras.

University of Kansas, Lawrence, Kans. Cadet Lt. Col. Ellis D. Evans,

University of Kentucky, Lexington, Ky. Cadet Col. Orris E. Philpot, Jr.

University of Louisville, Louisville, Ky. Cadet Col. Norbert J. Schneider.

University of Maryland, College Park, Md. Cadet Col. Charles O. Johnson.

University of Massachusetts, Amherst, Mass. Cadet Jonathan H. Snead.

University of Michigan, Ann Arbor, Mich. Cadet Robert B. Knudson.

University of Minnesota, Duluth, Minn. Cadet Lt. Col. Ralph D. Miller, Jr.

University of Mississippi, University, Miss. Cadet 2d Lt. Walter M. Denny.

University of Missouri, Columbia, Mo. Cadet Col. Larry K. Barton.

University of North Carolina, Chapel Hill, N. C. Cadet M/Sgt. Darwin L. Bell.

University of North Dakota, Grand Forks, N. D. Cadet Thomas W. Sullivan.

University of Notre Dame, Notre Dame, Ind. Cadet Terence Byrne.

University of Oklahoma, Norman, Okla. Cadet H. Dale Schroeder.

University of Oregon, Eugene, Ore. Cadet Kent C. Dorwin.

University of Portland, Portland, Ore. Cadet Lt. Col. Robert N. Hood.

University of Richmond, Richmond, Va. Cadet Lt. Col. Robert P. Stewart.

University of Rochester, Rochester, N. Y. Cadet Lt. Col. Robert G. Nagel,

University of the South, Sewanee, Tenn. Cadet Lt. Harry T. Edwards. University of South Carolina, Columbia, S. C. Cadet Donald O. Clark,

University of Tennessee, Knoxville, Tenn. Cadet Col. J. B. Sanders.

University of Texas, Austin, Tex. Cadet Col. Clarence L. Sledge.

University of Utah, Salt Lake City, Utah. Cadet Capt, Tom Brewer.

University of Vermont, Burlington, Vt. Cadet Col. John H. O'Connor.

University of Virginia, Charlottesville, Va. Cadet Albert J. Cox.

University of Washington, Seattle, Wash. Cadet Col. James M. Coshow.

University of Wisconsin, Madison, Wis. Cadet Lt. Col. Laurence W. Ketteler.

University of Wyoming, Laramie, Wyo. Cadet Col. Charles P. Stephens.

Virginia Polytechnic Institute, Blacksburg, Va. Cadet John L. Wright.

Washington University, St. Louis, Mo. Cadet Lt. Col. Julius S. Sweich, Jr.

West Virginia University, Morgantown, W. Va. Cadet, Lt. Col. Thomas O. Dobbins.

Willamette University, Salem, Ore. Cadet Col. David A. Townsend.

Williams College, Williamstown, Mass. Cadet M/Sgt. Charles K. Miles.

Yale University, New Haven, Conn. Cadet Maj. Robert L. Dedrick.

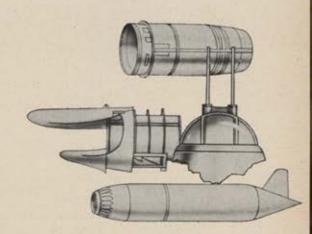


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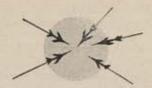
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22D BOMBARDMENT GROUP RE-UNION: The 7th reunion of the old 22d Bombardment Group will be held this year in St. Louis on Saturday, August 25, at the Jefferson Hotel. Lee Camene, 806 Rialto Building, 220 North 4th St., St. Louis 2, Mo., is in charge, or write Walt Gaylor, 650 Newark Ave., Elizabeth, N. J.

68TH FIGHTER REUNION: All "Can Heaters" and "Lightning Lancers" of World War II are cordially invited to attend the 68th Fighter Squadron Association's 4th Biennial Reunion August 31 through September 3, at the Hotel LaSalle in Chicago. All former vets not on the mailing list are urged to contact Art Leach, Secretary, Gate 20, Lakewood, Crystal Lake, Ill.

507TH FIGHTER GROUP: Would like to hear from Kenneth O. Gee, Stanley Yankulis, John Dorrance, Byron C. Gamble, Harry P. Klaetsch, Paul R. Stanley, Alfred Rivasplatter, Jr., Manuel Curiel, Norbert D. Emery, Orland S. Schevold, and other officers and enlisted men in the New York City, Philadelphia, Detroit, Chicago, Cleveland, and Los Angeles areas who were formerly with the 507th Fighter Group, Headquarters Detachment, 463d, 464th, and 465th Squadrons. Objectfuture reunions. Raymond W. Stoddard, 5 Maple Ave., Avoca, N. Y.

WHERE'S BILL? I'd like to locate a friend I've lost communication with. His name is Chief Warrant Officer William D. Morgan. His present address would be appreciated. M/Sgt. Painter C. Alexander, 228 Fenwick Dr., New Carlisle, Ohio.

AIRCRAFT ELECTRICAL SOCIETY: On October 25 and 26 the Aircraft Electrical Society will hold its annual display of aircraft electrical equipment at the Pan-Pacific Auditorium, Los Angeles, Calif. The British Advisory Staff of the Royal Aeronautical Establishment of Farnborough, Hampshire, England, will meet concurrently and will hold technical meetings during the day, prior to the electrical equipment display in the evenings. For further details write Edward Ryerson, Aircraft Electrical Society, 920 S. Robertson Blvd., Los Angeles 35, Calif.



F THERE is another world war, it will happen so fast that the last world conflict-from Pearl Harbor on-will seem as slow and formal as the battles of the Civil War. The components of our retaliation are like the mechanism of a watch with one delicate gear meshing into another: the air warning net, the communications system, aircraft speeds, guided missiles. All have accelerated, yet they must be adjusted to the slowest component that governs the entire mechanism-the staff.

It is this last gear-the governorthat has to be speeded up to keep pace with the supersonic planes and weapons. Any future war will not permit the leisure and esprit de corps of higher staff levels for individual allied air forces. It will be a war of joint command with allies working together as an integral unit. There will be no time for that ambiguous, often pleasant, often frustrating occupation, known as liaison.

In 1945, two heads of air forces, Gen. Carl A. Spaatz and Marshal of the Royal Air Force, Lord Tedder, recognized the shape of things to come. They agreed that the fine wartime cooperation between the USAAF and the RAF must be continued, But observers and liaison officers could not accomplish this. Officers should be exchanged, and these officers had to fill true job positions in each other's air force. In 1947 fewer than twenty officers were exchanged between our Air Force and the RAF. By 1949 all the wrinkles had been ironed out, and since then, in a continuous flow, about eighty officers a year have been exchanged.

An exchange officer serves two years in the other air establishment. He always wears the uniform of his own country, salutes in his own way, is carried administratively in his own air force. His leave, pay, expenses, allowances, travel pay, flight requirements and records, and the like are in

accordance with the regulations of his own air force. But otherwise he is like any other officer in the host air force. He is subject to its orders, discipline, regulations and traditions, and his efficiency reports are filled out by his superiors and go into his 201 file.

It was the incongruous sight of a major heading an RAF squadron; a captain leading the top RAF aerobatic team at a Farnborough air show; a colonel attending the equivalent of our Air University, and other scattered glimpses of isolated USAF uniforms on an RAF base that led me to visit Col. Harold P. Sparks, then Chief of the Air Exchange Section in the Air Attache's Office on Grosvenor Square in London. (Colonel Sparks has since returned to the US and has been replaced in London by Col. Wayne K. Richardson.)

'My counterpart in the Air Ministry, just a half mile away, is Mr. R. W. Hunt," Colonel Sparks explained. "With his help we've worked out an informal system to integrate the arriving exchange officers and their families more quickly. The exchange officer who is leaving prepares a station report, and there is an exchange of letters between both families months before the new officer and his family arrive. You know, the usual information-what they'll find on an RAF station in the way of food, furniture, type of school, and all the rest, and what to bring in the way of clothing-besides raincoats and rubbers.

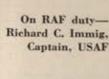
"However, the new officer generally does not fill the exact job slot of the outgoing officer in the RAF. For example, Maj. Howard Tanner is the CO of 259 Burma Squadron. He led the RAF fighters in the 1954 Battle of Britain Day fly-pass. Major Tanner's

British-American Exchange Program

YANKS

By Larry Bachmann

On RAF duty-Richard C. Immig,





Maj. Howard Tanner commanded an RAF unit.



Major Tanner confers with F/O P. H. Philip and Flight Lt. J. Mellers.



Major Tanner's family welcomes him at end of the day.



The major greets his replacement, Sqdn. Ldr. Steele.

replacement is here. In fact, both his replacements are here—the RAF officer who is taking his exact slot as CO of the fighter squadron at Wattisham, and the USAF exchange officer who is replacing him on this program. He's Maj. Roy O. Roberts. Major Roberts is taking over from an RAF squadron leader as CO of the 43 Squadron at RAF Station Leuchars, Fife. That's next to St. Andrews in Scotland. Oh sure, Major Roberts plays golf."

Colonel Sparks went on to explain that sometimes in staff positions on a higher level—in the Air Ministry, for example—an American officer may be succeeded by another American exchange officer. But the general rule is to rotate the exchange officers throughout the entire RAF. In that way the new officer is faced with the situation of coming into a position where the personnel are not used to Americans, where he has to adapt himself quickly.

The roster in the office of the Air Exchange Section showed officers from full colonels down to captains. They were serving as instructors or attending every type of school in the RAF. There were officers in staff and operational slots in the Air Ministry,

Fighter, Bomber, Coastal, Training, Technical Training, and other commands. With the help of Colonel Sparks I selected several officers to interview.

"I have carte blanche from the RAF to visit any of our exchange officers at any time," Colonel Sparks explained as he hung up the phone, after talking to Mr. Hunt at the Air Ministry about my visiting some of the RAF stations. "But it's better all around if they know you're coming."

Colonel Sparks explained how and where I was to meet Major Tanner, who was completing his two-year tour at RAF Station Wattisham, near Ipswich in Sussex.

Maj. Howard N. Tanner, Jr., and the other officers I interviewed represent just what the United States expects its representatives to be: modest, intelligent, imaginative, alert, men with a sense of humor, and above all, a keen awareness that each is an official and an unofficial ambassador of his country at all times.

Major Tanner, age thirty-five, home town Paramount, Calif., attended Compton Junior College, graduated from the US Military Academy at West Point in 1944. For two years he was Commanding Officer of RAF 259 Burma Squadron. (This day-fighter squadron was so named upon activation during World War II because the planes were provided by funds from people who had lived in Burma.) Major Tanner and his family were given a furnished house on the RAF station at Wattisham. He took over command from an RAF officer and turned the squadron back to one, Squadron Leader John C. Steele.

Upon arriving in England in 1953 Major Tanner was checked out in Meteor 7s and Meteor 8s. His squadron flew the latter plane for a year. His was the first squadron in the RAF to get Hawker Hunters, the new basic Fighter Command plane. According to Major Tanner this was why 259 Squadron was the first squadron, with him in the lead plane, in the annual fly-pass on Battle of Britain Day in 1954.

The Tanners, like all other exchange families, except those stationed in London at the Air Ministry, were the only Americans on the base and in the community. The Tanner children went

(Continued on following page)

to school in nearby Ringshall. The only thing that marked them as Americans was the fact that their parents hadn't lost their "foreign" accent. Four of the Tanner children spoke immaculate British—the youngest gurgled that way. Susan, then nine, was born in California; Howard, eight, on Guam; Don, seven, in Alabama; Dick, five, in California; and Tommy, in England, in August 1954.

"No, it wasn't too difficult getting used to RAF procedure," Major Tanner answered my question. "A number of expressions are different. Sometimes the words are the same but the meaning is something else. After two years I now think of an aircraft as being US—unserviceable—instead of out of commission. Wing headquarters is the equivalent of our group headquarters. Landing-gear is under-carriage. When the baker arrived at our door shortly after we arrived, Jean, my wife, tried to buy some cookies. The

baker had everything out of his cart before he realized she wanted biscuits.

"In the air the language difference creates no problems. Communications are easy to pick up. The RAF's are a bit briefer than ours. They use the old phonetic rather than the international phonetic. Flying, by and large, is more rugged here than it is at home. But that's to be expected because this is an island where bad weather is the rule and not the exception. We often take off in 300-foot ceilings with poor visibility and generally grim conditions,

"You get used to being brought back on zero-zero conditions. The RAF has excellent procedures. The system operates on cathode ray, and they give you immediate findings and vectors. They can recover aircraft even when the pilot is speechless. If the pilot can't reply for any reason, he can signal by flicking the button of his mike on and off. So you can under-

stand that I'm very partial to the RAF equipment. I've gotten attached to it and I trust it. And I trust the men who operate it.

"We have at least two exercises every month. Usually they're Fighter Command exercises. But sometimes they involve Bomber Command, the Fleet Air Wing, and NATO which also means the USAF.

"In my opinion this program is invaluable for the exchange of knowledge about the two air forces. I know I've gained personally from every aspect, and so has my wife. In line with my official duties, I spent two weeks taking the air defense courses at RAF Station Old Sarun. I've given talks to the Royal Observer Corps—the equivalent of our Ground Observer Corps. Also to other organizations, explaining the nature of our work in the RAF. All of this is part of the regular duties of an RAF squadron leader."

According to Major Tanner and



USAF's Capt. Richard G. Immig leads Squadron 54 aerobatic team. Here the planes, in perfect position, are going straight up into a loop. The pilots of the team are shown above, right, in same relative position as in formation.



From left: F/O B. J. Noble, Capt. Richard Immig, F/O P. V. L. Hamilton. Kneeling: Pilot Officer K. Curtis.



Capt. and Mrs. Richard G. Immig at a party. Mrs. Immig's crew haircut seems to be the center of attraction.

other officers there is little difference in flying procedure between the USAF and the RAF. On the ground the differences are elusive, and it becomes a bit difficult to compare the RAF ground organization with ours. Essentially it appears to boil down to the fact that the RAF operates with a minimum of paper work. They do not go in for the various daily, weekly, and bi-weekly reports that we have. They only have monthly reports. This leaves the squadron commanders, and especially the flight commanders, more time to fly with their men. Essentially in the RAF the squadron is more operational and less administrative than in our Air Force.

"How do I get along with my superior officers?" Major Tanner repeated my question. "Wizard! Simply wizard! The Station Commander is Group Capt. H. I. Edwards, V. C. He's an Australian who graduated Point Cook, the air academy, and is a regular RAF officer. Under him on the station is the Flying Wing, Administrative Wing, and the Technical Wing. My immediate superior is Wing Commander (Flying) C. S. Vos. He's a South African and is also a regular RAF officer. So you can see we're quite an international organization."

Major Tanner also explained a unique social and sporting activity of the RAF. And so did every other exchange officer with whom I talked. It is the Dining-In. There is an American equivalent for it, at the Air University's Squadron Officer School, at Maxwell AFB, Ala.

Every month at each RAF station there is a Dining-In Night. It is for all officers. It is a pointed honor for an outsider to be invited to attend as a guest. Everyone wears dress uniform; a civilian wears a tuxedo. Normally the Dining-In starts at 7:30 in the evening. Everything is formal and correct. Upon entering the mess each officer pays his respect to the president of the mess committee, known as the PMC. Then respects are paid to the Station Commander and to the individual officer's immediate superior. A glass of sherry is the correct drink.

Dinner is announced at 8:00. It is a most elaborate and perfectly served meal with rows of forks, knives, and spoons beside each service place, as well as various sizes and types of glasses with the correct wine in the correct glass at each course of the meal. No one smokes during the meal. The dinner is ended with a toast of a glass of port to Her Majesty the Oueen.

Smoking is now permitted. Person-



At Air Exchange party, from left: Col. Harold P. Sparks; Maj. Ray D. Roberts, RAF Leuchars, Scotland; Col. Wayne Richardson; the author, Larry Bachmann.

nel arriving at or leaving the station are called upon to make speeches. Then the PMC asks the vice president of the mess committee, usually the junior officer of the mess, to take his chair. This means that the formal part of the occasion is finished and the mess games can proceed.

If there is an ante-room or barroom, it is used as the playground; if not, then the dining tables and chairs are stacked against the walls and all breakables are removed from the room. The mess games are called: high-cockolorum, schooner-ace, the bottle-in-the-box, tunnel-of-love, mess football and a few others of similar title. The rules and descriptions of these games are not to be found in the British equivalent of Hovle's but ar handed down from generation to generation like tribal rituals. Several generalizations may be permitted about these games: they require skill, dexterity, brute force, and they last most of the night. But there is one inflexible rule-every officer is expected to report for duty on time the next morning, in condition to perform his regular

As a rule ladies are not invited to a Dining-In. Ladies are not permitted in the officers' mess except on Saturday, Sunday, and holidays because the mess is considered less a club and more the home of the bachelor officers. However, in honor of Major and Mrs. Tanner, a Dining-In was given for them on the last Thursday they were at the station. To it were invited the wives of all the officers. Needless to add, dancing was substituted for the mess games for the first part of the post-dinner entertainment.

Several days later I saw Capt, Richard G. Immig of Gillette, N. J. He and his family arrived in England just a year after Major Tanner, Captain Immig is a flight commander in 54 Squadron, RAF Station Odiham, seven miles from Farnborough. I was at the annual air show at Farnborough and along with a few million other people I saw him perform without realizing he was the leader of the only aerobatic flying team exhibiting at this event,

"We had Meteor 8s when I got there," Captain Immig said, "We knew we'd soon have Hawker Hunters. And we also knew that the competition for aerobatic team flying was coming up soon. Our group was keen to win it. I'd done a bit of this sort of flying at home and was naturally enthusiastic about it. We organized a team in our flight and started working three months before the Hawker Hunters arrived. We reached our aerobatic flying proficiency at just the right time.

Sure there were some problems but they were quite minor. Like explaining to the box-man in the aerobatic team that the nose of his craft should come back after every display black from being close to my jet-blast. He took me too literally and kept burning off the rubber on his radome until I had him move down a bit. The chaps in our flight didn't believe we could win. They were always kidding me about my crew haircut. In England only convicts have their hair cut this way. The other three members of the aerobatic team made a pact that they'd get crewcuts, too, the day we put on our first formal aerobatic show

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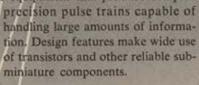


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as an official RAF team. And they did!

"We've been flying in all sorts of formal displays. This is the first time in some years that the RAF has officially participated in the annual air show at Farnborough, and naturally we're quite proud that it was our team which represented the RAF.

"I know I'm proud to be in 54 Squadron. It's the famous RAF outfit which made the first transatlantic jet crossing in 1948, flying Vampires. The squadron did a goodwill tour of the US. I wouldn't mind doing one and showing the boys back home how good these chaps are.

"My wife, Betty, and I have open house all the time for everyone in the flight. The boys converted us to kippers for breakfast, and tea and crumpets in the afternoon, and so we've been converting them to Chinese and Mexican food which Betty knows how to make. And the boys sure like it.

"No, our children don't go to school yet. They're too young. One's under two years and the other was born here four months after we arrived. Oh, they're both girls. Didn't you know that even fighter pilots have girls?"

But if Captain Immig's girls don't go to school, their papa makes up for them by going twice a week. On his own initiative he drives an hour each way at night to the nearest US \F base where he attends the University of Maryland extension course to get credits for a university degree.

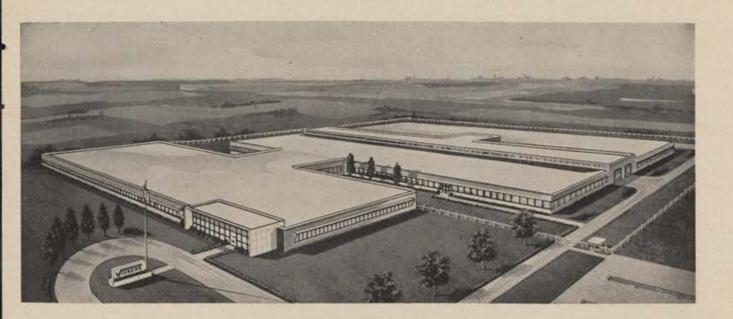
While at the Air Ministry talking to Mr. R. W. Hunt, Colonel Sparks's counterpart in the RAF, I was able to visit one of our WAFs stationed in the same building. Lt. Col. Rosalie R. Feldman was not in uniform. She explained that uniforms were not worn at the Air Ministry unless the officer was going out that day on a field trip or returning from one. On all official occasions where a uniform is required, she, like the other exchange officers, wears her regulation USAF uniform. She fills an RAF slot, working directly under the Commandant of WRAF, in the Enlisted Women's Branch, dealing with plans, policy and recruiting of enlisted women.

"The main requirements for this job is that the officer must have a comprehensive background in military personnel and administration at staff level. Staff experience is necessary. I was fortunate in having this training before coming here for I was WAF Staff Director at Headquarters Air Research and Development Command at Baltimore, Md.

"Actually our two services, as far as (Continued on page 277)



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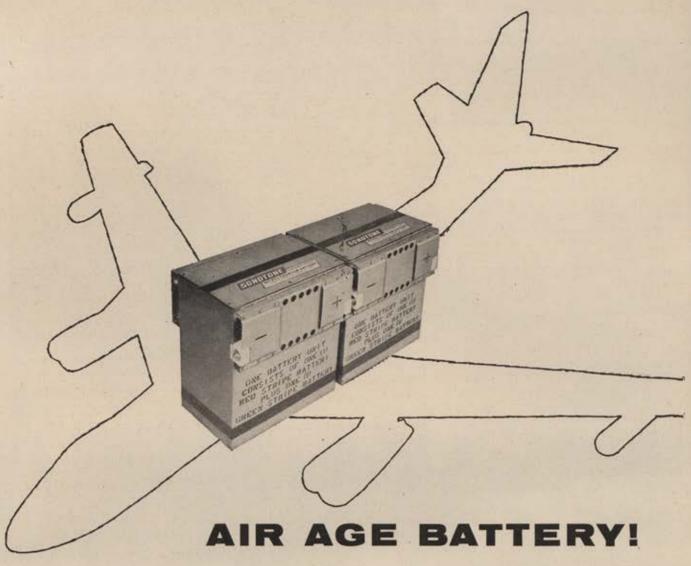
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women are concerned, parallel each other closely," Colonel Feldman explained. "Our women's organization began three years after the RAF and we patterned ours on theirs. The problems are the same. The only difference I can think of off-hand is that in the RAF the enlisted personnel can purchase their discharge. The amount to be paid for such a discharge is dependent upon how long the girl has served. In some cases, where she is filling a critical position, it isn't possible to obtain a discharge in that manner.

"I've traveled to all stations where there are WRAF in Great Britain. By being in this slot I'm also automatically a member of the Nufield Trust Fund. It's a fund which handles the welfare of women on the stations. . . . You'll be interested to know that there are four WRAF officers right here in this building in the Air Ministry who've been to the United States on the exchange program.

"Did I ever attend a Dining-In?" Colonel Feldman stared at me across her desk. "Of course, I attend the Dining-In every month. Just like every other officer in the RAF."

There must be something about the British air or the RAF which brings out tradition, for the exchange program has developed its own in the form of an annual Dining-In. Once a year all of the officers who are serving in the exchange program come into London and spend a day going over all the problems and exchanging information. And that night there is a dinner and a dance; all of the officers are urged to bring their wives. I was fortunate in being able to attend the last one given in honor of Colonel and Mrs. Sparks, whose tour of duty was completed here, and to welcome his successor, Col. Wayne N. Richardson and Mrs. Richardson.

My wife, who was also invited, summed up the whole thing by turning to me and saying that she'd never seen a more attractive and intelligent group of men and women anywhere. I nodded and added that they had to be. These would be among the main staff officers in the event of any conflict for they would be the ones who would know how the RAF as well as the USAF functioned.-END

ABOUT THE AUTHOR

Larry Bachmann, a wartime member of the AIR FORCE Magazine staff, has written a number of articles for us. His latest offerings have been "On Target" in the March '55 issue, and "Second-Chance Camp" in April '55.



'no sweat' when the 'heat's on'!

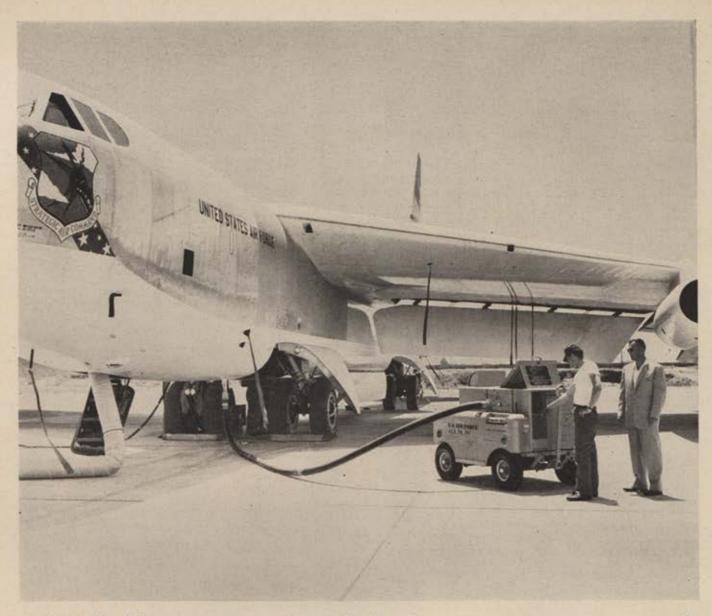
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Joe Jacobs and Paul Simmons check grand prize publicity before start of Utah Airpower Symposium in Salt Lake City.



Wing Commander Len Dereszynski welcomes Lt. Col. James Jabara to the Jet Age Conference in Milwaukee, June 5.

THE COMMUNITY IN THE JET AGE

National conference serves as a guide for AFA units

THE TRAGIC collision in June of two airliners high above the Grand Canyon in Arizona, which killed 128 men, women, and children, shocked the nation. But it came as no surprise to those familiar with the air traffic situation in the US, who have been well aware of the frightening possibility of just such an accident.

The inadequacy of what AFA President Gill Robb Wilson called "horse-and-buggy airways" and the need to familiarize the nation with this and other problems of the approaching Jet Age, led to AFA's sponsorship of a Jet Age Conference in Washington in February (see Am Force Magazine, March '56). Since public understanding of the issues involved is imperative if we are to move smoothly into the Jet Age, AFA gathered together as many

aviation experts as possible and asked them to present their views and discuss the problems.

That Conference, which attracted more than 1,500 registrants from all segments of American airpower, was so successful that AFA National Headquarters prepared a kit to help AFA units stimulate local programs on the same subjects. As a result, more than a dozen local programs have already been staged—and more are planned. The box below lists—chronologically—the local programs to date. Over 2,500 aviation and civic have attended.

The local AFA units received help from the Air Force, industry, radio and TV stations, and local newspapers. Baseball's "Dizzy" Dean gave the Tulsa Conference nation-(Continued on following page)

LOCATION	DATE	LENGTH	IN CHARGE	ATTENDANCE	AREA COVERED
Salt Lake City	January 28-30	3 Days	David Whitesides	425	State
Baltimore	March 11	½ Day	Meir Wilensky	75	State
Long Island	March 15	½ Day	Julian B. Rosenthal	375	Local
Miami	March 17	1 Day	J. Alan Cross and Theodore Koschler	150	State
Santa Monica	March 17	½ Day	Gil Nettleton	300	City
Pittsburgh	April 14	½ Day	Carl Long	50	City
Long Beach	April 21	½ Day	Joanne Affronte	125	State
Tulsa	May 2-3	2 Days	Harold C. Stuart and Russell F. Hunt	550	Region (8 States)
New York	May 12	1 Day	John A. Mack	75	State
Harrisburg	May 26	½ Day	William Lunsford, Jr.	75	State
Chicago	June 1	1 Day	George Anderl and Morry Worshill	30	Region (6 States)
Minneapolis	June 4	½ Day	Robert P. Knight	250	City
Milwaukee	June 5	½ Day	Leonard Dereszynski	200	City
Boston	June 9	1/2 Day	Abbot Allschwang	40	State
St. Louis	June 30	1 Day	J. Chesley Stewart	100	(4 States)



Massachusetts Governor Christian A. Herter signs Airpower Proclamation for Boston Conference. Others, from left: Phil Coury, Gus Raidy, Al Eldredge and James F. Winston.



At the Harrisburg Conference, Joe Dougherty and Martha Wilcox of the Philadelphia Squadron discuss Jet Age problems with Frank Piasecki, a conference panel member.

wide coverage on his "Game of the Day" telecast, and Harold Stuart said this coverage was at least partly responsible for the requests for invitations which came from more than twenty states. Chambers of Commerce pitched in to put the programs across. The AF, under a barrage of noise complaints—and realizing that the problem may get worse before it improves—was glad to have the opportunity to present its side of the story. And the aircraft industry, also working on the same noise problem, was anxious to tell of the efforts being made to solve it.

Most of the credit for the success of the local programs belongs to those who organized and directed them. On Long Island, AFA National Secretary Julian B. Rosenthal handled the arrangements for a conference that drew a crowd of 375. And in Tulsa, Harold Stuart and Russell Hunt headed a committee that put in long hours arranging the conference there. The story was much the same elsewhere.

It is through this type of program, carried out at a local -as well as a national-level, that public understanding, so vital to aviation, can be created. Maybe if enough Americans had understood, early enough, what Jerome Lederer, Managing Director of Flight Safety Foundation, Inc., told the Jet Age Conference in Washington, we need not have waited for a mid-air tragedy to stir public and official interest. Mr. Lederer said, "We are already living with a critical collision problem." He quoted a report, made by a government committee headed by William B. Harding of New York, which said, "The collision hazard is becoming greater as increases in civil and military air traffic outpace the capabilities of outmoded traffic control facilities." Mr. Lederer went on, "Fortunately there never has been a fatal collision between two scheduled airplanes. No greater evil could befall aviation than a fatal collision between two large air transports." He further quoted from the Harding Report that there are, on the average, "four reported near collisions involving the airlines daily.

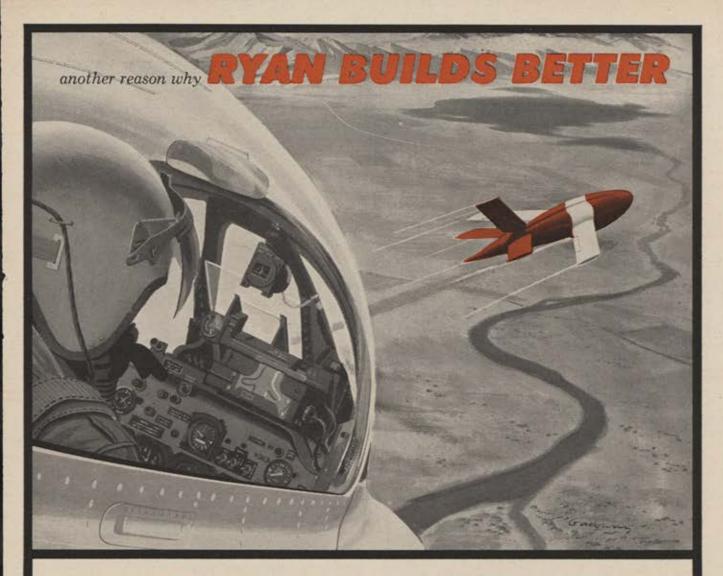
Even with the best controlled air traffic system humanly possible, none can say that the tragic collision would not have occurred. But it is criminally negligent for Americans to know and understand that we do not have an adequate air traffic control system and then not do anything about it. Every citizen bears a responsibility for seeing that the old story of "too little and too late"—too little understanding, and no action until it is too late—does not figure in the deaths of more innocent persons.—End



Twin City Squadron Commander Phil Knight, AFA President Gill Robb Wilson, and Executive Director Jim Straubel at the Minneapolis Conference, Straubel was the moderator.



J. Alan Cross, Conference Chairman, opens Miami program as Ted Koschler, Miami Squadron Commander, checks some last-minute details. Cross is Florida Wing Commander.



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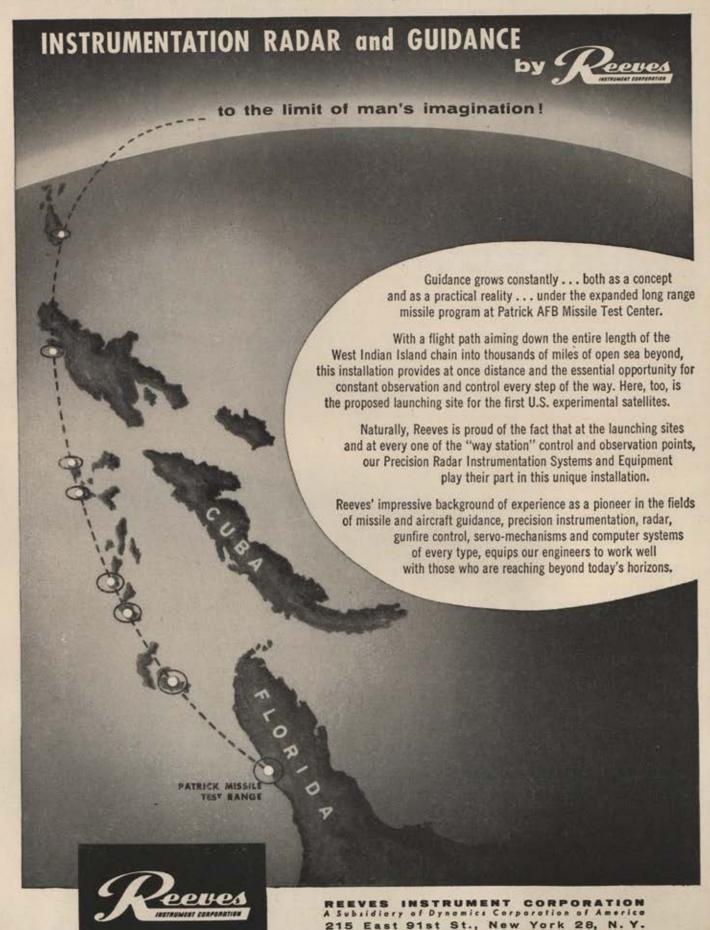
The Firebee is dramatic proof of Ryan's skill in blending aerodynamic, jet propulsion and electronics knowledge to solve a complex aviation problem... meet a military need. Ryan's jet-powered VTO now being tested at Edwards Air Force Base is another example of Ryan's forward-looking engineering ability.

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Local Programs in the AFA Spotlight

A ROUND-UP OF ACHIEVEMENT AT THE LOCAL LEVEL IN THE YEAR SINCE SAN FRANCISCO



Officers of AFA's newest Squadron—Las Vegas—pose for a portrait. Raymond F. Culley, second from left, is Commander. Charter was approved July 6, 1956.

This has been a year of great achievement for AFA individuals and units. Of particular note have been the local programs designed to stimulate community interest in the aims and objectives of airpower. For example, AFA's national secretary, Julian B. Rosenthal, was chairman of a program on Long Island that attracted 375 persons. And a Southwest Jet Age Conference in Tulsa, Okla., organized by past AFA President Harold C. Stuart and Russell F. Hunt, accomplished a great deal toward better understanding of the problems in the development of modern aviation. The story has been much the same throughout the na-

The Utah Wing sponsored a twoday Jet Age Conference featuring symposiums on airpower, education, and national and civil defense; and a week-long airpower exhibit that was open to the public. The Wing has already announced plans for a Mid-Year Airpower Symposium to be held in 1957.

In Illinois, George Edgeumbe, owner of Elmhurst Airport, furnished the equipment and gasoline and even rented extra airplanes this year so the large turnout of kids for the Du Page Squadron's 3d Annual Kid's Day program wouldn't be disappointed. Besides Edgeumbe, others responsible for the success of the program are Squadron Commander Vern Arnt, John L. Carr, Cameron S. Orr, and John Novak.

Detroit's Vandenberg Squadron honored the top awards winners of all area AF-ROTC units at an AF- ROTC Awards Banquet, drawing a crowd of 350 to the Statler Hotel. The Kelsey-Hayes Wheel Company, an AFA Industrial Associate, was host for the evening and introductions were handled by Kelsey-Hayes's vice president, Lawrence W. Downie. Principal speaker was Maj. Gen. Francis H. Griswold, Vice Commander

SQUADRON OF THE MONTH

The San Francisco Squadron San Francisco, Calif.

CITED FOR

outstanding programming in the field of community relations. Its sponsorship of the tour of leading civilians through the B-52 facility at Castle Air Force Base has aided greatly the better understanding of the role and mission of the Strategic Air Command.

of the Strategic Air Command. Russell Lloyd is Squadron Commander.

The Lansing, Mich., Squadron held a similar program at the Michigan State University field house. It was arranged by a committee headed by Richard Pifer, Squadron Commander. Principal speaker was AFA President Gill Robb Wilson.

In the important field of youth aviation education, the Tampa, Fla., Squadron-primarily through the efforts of Squadron Commander George Lyons—has been instrumental in persuading more than twenty Florida schools to place aviation education courses on the curriculum. And the Nittany Squadron, at State College, Penna., is co-sponsoring—for the third year—the Penn State Aviation Education Workshop.

(Continued on following page)



Gill Robb Wilson is shown with recipients of AF-ROTC awards following the Awards Dinner sponsored by the Lansing Squadron at Michigan State University.





Left: Sen. Barry Goldwater, second from left, at Arnold Squadron Charter presentation. Right: Gill Robb Wilson and Gwynn H. Robinson, Broadmoor Sqdn.



From left: Cliff Griffin, Gen. Earle E. Partridge, Maj. Gen. Roy Lynn, and Thomas F. Stack at San Francisco's 1956 Armed Forces Day Luncheon program.



Winfield Young, left, gives membership to Gov. Arthur B. Langlie, Wash.



Walt Savage and Don Steele place wreath on grave of Gen. H. H. Arnold at Arlington Memorial Services for AF dead.



Leaders of the new Dallas Squadron, from left: George McMories, Paul Cain, James Lockart, Jr., and Carr Collins.

Another good way to spread the airpower word is through trips to Air Force installations for civic leaders, educators, and business leaders. The San Diego, Calif., Squadron sponsored a trip to Edwards AFB, Calif., and the San Francisco Squadron sponsored one to Castle AFB. Featured on the Castle tour was the giant Boeing B-52 Stratofort, while the group from San Diego toured the ARDC facilities at Edwards and examined the different types of aircraft being tested there.

In the membership department, Arthur C. Storz, AFA's Man of the Year in 1955, concluded a campaign which netted more than 1,500 memberships—about half of them new. The San Francisco Squadron signed up 418 memberships since the close of the 1955 Convention and received a total membership refund of \$627. And in New York City, the Metropolitan New York Squadron—active for only two years—has signed up

240 members. The Membership Committee is headed by Miss Ruth Stern.

The San Francisco Squadron, through its efforts during the past ten years, has gained much stature in the community.

Thomas F. Stack, first San Francisco Squadron Commander, was named by the city as General Chairman of the 1956 Armed Forces Day commemoration. The highlight of the program he planned was a luncheon on May 19, featuring Gen. Earle E. Partridge, Commander-in-Chief, Continental Air Defense Command.

More than 350 people filled the Press & Union League Club to hear General Partridge. Warning that the US is now faced with a problem that has never before confronted the American people, he said that "we are directly exposed to the threat of catastrophic attack." Among the honored guests at the luncheon was Maj.

Gen. Roy H. Lynn, Commander, Western Air Defense Force (see cut).

The following month, the Squadron sponsored a trip to Castle AFB for more than 100 of the city's leading officials, educators, and professional men. Squadron Commander Cliff Griffin directed the trip.

Taking off from San Francisco Municipal Airport in two C-124s, the group made the short run to Castle, where they were met by Lt. Col. Richard J. White, Base Commander, and escorted to a briefing by Brig. Gen. William E. Eubank, Commander of the B-52 SAC wing there. General Eubank spoke to the group on the mission of Castle AFB, the Strategic Air Command, and described the B-52. They had lunch at the Officers Club, took a brief tour of the flight line, and ended up with an inspection of one of the bombers. Several feature articles appeared in San Francisco papers as a result of the tour.

The old saying, usually applied to the weather (everybody talks about it but nobody does anything about it), could well be applied to Air Age Education. The importance of this subject is recognized, but there are too few community programs devoted to it.

One program, however, stands out the Aviation Sciences Institute, started in Seattle early this spring by Winfield G. Young, Jr., AFA's Northwest Regional Vice President. Young spent countless hours of his own time lining up the necessary instructors, textbooks, meeting places, etc., and in April he held the first class. More than 100 youngsters—and a surprisingly large number of parents—turned out that night.

Since then, the ASI has continued to develop well, and may become one of the best AFA Youth Education programs.



Young was assisted by the Greater Seattle Squadron—principally by James Nelsen, Seattle Commander. Between them they have put together a highly commendable program.

Under the guidance of some of the leading citizens of that city, the Dallas Squadron is developing into a top AFA unit. On June 11, a group of fifty community leaders met for lunch, at the invitation of Eugene McElvaney, Vice President of the First National Bank. AFA Board Chairman John R. Alison and Executive Director James H. Straubel addressed the audience on the aims and objectives of AFA, and received a unanimous pledge of support from the group, which voted to call itself the Dallas Airpower Council.

This group will be on call to assist and advise the Dallas Squadron,

Carson Sheetz, right, receives award from Capital City Reserve Squadron.

Below: Loyola's Arnold Air Society Squadron wins 1956 Maryland Trophy.





Jack Norris, Washington Post reporter, accepts Capital Squadron award from D.C. Wing Commander Walt Savage and Squadron Commander Don Steele.



Ruth Nichols accepts honorary Philadelphia Sqdn. membership (see text).

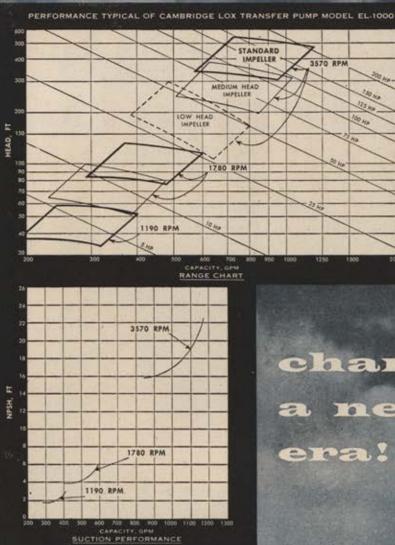
which was reactivated the same night. At this meeting, called by the new Squadron Commander, Paul Cain, owner of a public relations firm, the members took on several projects, the most important of which was a program of educating the general membership, the Council, and the community, on airpower.

A long-range aim of the Squadron is to host the 1958 national AFA Convention. Leaders in the movement are Cain, Brig. Gen. Luke Smith (USAF, Ret.), Assistant to the President of Temco Aircraft Corp.; Al Harting, Advertising Manager of Southwest Airmotive Company, and many others.

Joe Dougherty, Commander of the Metropolitan Philadelphia Squadron, read in a recent news story that Ruth Nichols, famed aviatrix who at one time held the speed, altitude, and distance records for women, was going to be in Philadelphia to accept an honorary award from the University of Pennsylvania. The Squadron contacted her, presented her with an award, and made her an honorary member of the Squadron. The Squadron received excellent local publicity as a result.

We cite also the programs in which the Squadron honored Delta/C. & S. Airlines for their first flight into Philadelphia; and Capital Airlines, when it instituted Philadelphia service with the Viscount.

The Mobile, Ala., Squadron, formed a little over a year ago, got off to a slow start, but recently has instituted the "San Francisco" plan (Continued on page 287)



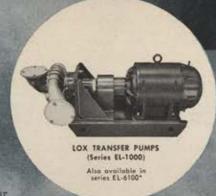
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Gen. George C. Kenney at the Georgia Wing Ding with program planners. Wing Commander Ernest Vandiver is third from right; Homer Flynn is at the right.

of luncheon meetings featuring outstanding airpower speakers. The effort has paid off in good attendance.

In June, more than 200 members and guests turned out at Brookley AFB Officers Club to hear Republic Aviation Corp. Sales Representative Robert S. Johnson, World War II fighter ace and former AFA National President. Will Ross is Squadron Commander.

The Georgia Wing, under the direction of Homer Flynn, Assistant Adjutant General for Georgia, sponsored its First Annual Wing Ding. It was held in the Henry Grady Hotel in Atlanta, and featured an address by Gen. George C. Kenney, Past AFA President. More than 200 guests attended the cocktail party and banquet.

General Kenney pointed out the great danger facing the nation today due to the general feeling of complacency, engendered by the so-called "peace offensives" of the Communists. Referring to the present comparative status of the USAF, he said, "We cannot win a modern war without first winning the air war. If

"Jock" Henebry, George Anderl, Gen. George Kenney and Morry Worshill at Chicago Civil Defense program in May.

a country has the best air force it probably won't get into a war; and if it does get in a war, it can't lose."

Flynn was toastmaster at the banquet. John T. Allan and Col. Bernard M. Davey, Commander, 116th Fighter-Bomber Wing, Georgia ANG, assisted him on the program committee. The entire function was under the direction of I.t. Gov. S. Ernest Vandiver, Georgia Wing Commander.

Boston's Minute Man Squadron sponsored its first annual Airpower Banquet and Military Ball on May 5, at the First Corps Cadet Armory, Boston. The approximately 500 who attended heard Brig. Gen. Felix A. Vidal, ConAC Deputy Commander for Reserve Affairs, discuss the USAF Reserve program.

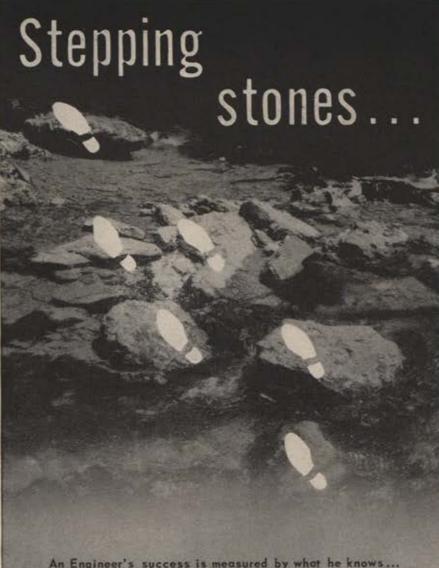
Included among the honored guests were Lt. Gov. Sumner G. Whittier; Rep. Laurence Curtis; Lt. Col. Arthur C. Carroll, Commander, 89th Fighter-Bomber Wing, USAFR; and Charlotte S. Kelley, prominent aviatrix who was awarded an honorary membership in the Squadron.

Richard E. Carter is Commander of the Squadron, and Harold F. O'Neil, Past Commander, was program chairman.

June 21 was the tenth anniversary of the first meeting of AFA's first chartered Squadron. On that date ten years ago, a group of members and prospective members gathered in Baltimore's War Memorial Building and formed the number one Squadron. The correspondence from those days indicates that the idea, when it came from Baltimore, was met with some dismay at AFA Headquarters, which at the time had no policy plans for

(Continued on following page)





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forming or recognizing such a group. John R. Mitchell was the early leader in the organization of the Baltimore Squadron #1, which is still active in AFA circles. He was elected Commander. Other familiar names on the officers' roster are those of Samuel M. Hecht, Treasurer, who is now National Treasurer; and Charles W. Purcell, now a Regional V-P.

The guest and participant list at that first meeting reads like a page out of Who's Who. The speakers were Stuart Symington, then Assistant Secretary of War for Air, Gen. Carl A. Spaatz, then Commanding General, US Army Air Forces, and Jimmy Doolittle, then AFA's first President.

Honored guests on the list included Sen. Millard E. Tydings, now again running for the Senate; Sen. George L. Radcliffe, now a director of the Maryland Historical Society; Gov. Herbert R. O'Conor, now an advisor to the mayor of Baltimore; Mayor Theodore R. McKeldin, now the governor of Maryland; and the late Glenn L. Martin.-END



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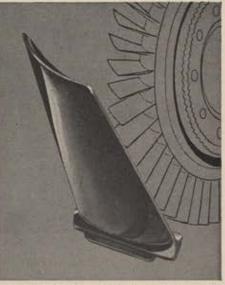
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Lt. John Macready and Lt. Oakley Kelly-first to fly coast-to-coast, non-stop.

KELLY, MACREADY and

N 1918, after emerging victorious from what some still fondly refer to as the "Big War," the country quickly stripped off its armor and set out to have a big time. The relative handful of flying men who managed to stay in uniform after the dust settled found themselves with a few hundred surplus warplanes, mostly tired old Jennys and DH-4s. Postwar appropriations barely covered the payroll, with little left over for gas and operations costs or even paint for barracks. Hard-pressed to justify their own existence, the air veterans had no clear plans for the future or funds with which to test their many theories. In short, the Air Service had yet to find itself. But it believed

passionately in the airplane and its place, whatever it might prove to be, in the military scheme of things.

Those bleak days of the early 1920s have been called the "stunt era" of Air Force history and with good reason. Army pilots seized every chance to fly their war-weary crates into the limelight. Aerobatics, races, endurance hops, parachute jumps, in-flight refueling, altitude attempts, forest fire patrols, border work-no opportunity was missed to advertise the airplane's usefulness and versatility. So, when Lt. Oakley G. Kelly approached his superiors at McCook Field, near Dayton, with a plan to fly from coast to coast non-stop, he was immediately ordered to proceed.

Col. R. L. Hartz and his crew had recently flown a Martin bomber around the boundaries of the United States, a distance of 9,000 miles. Lt. William D. Coney had pushed his DH-4 from San Diego to Jacksonville in twenty-two hours flat, landing en route for gas. Then Lt. Jimmy Doolittle, flying the same course from east to west in his DH, landing at San Antonio for fuel, shaved forty-one minutes from that record. These flights rated the sort of front-page treatment the Air Service needed. People were saying, "Those Army boys can do anything," and that was good. The time was ripe for a non-stop attempt.

Kelly had his eye on the big T-2,

a brand-new transport just delivered. It was one of the few new types Gen. Billy Mitchell had been able to wrangle since the Armistice. The T-2 was a high-wing monoplane designed by Anthony Fokker, the brilliant Dutchman who supplied the Germans with great fighter craft during the war and then escaped to Holland, under the noses of Armistice Commissioners, smuggling more than a hundred aircraft with him. A sizeable airplane for its day, the T-2's cantilever wing measured seventy-nine feet, eight inches, tip to tip (about ten feet more than the Douglas B-26). Ten men or a ton and a half of freight could fit in the long, slab-sided fuselage which sported four huge oval windows on each side. In the big. blunt nose was a Liberty engine which fed 420 take-off horsepower to a two-bladed wood prop. The Air Service got two of the ships.

With all of its odd features and clumsy appearance, the T-2 was a remarkably clean design, able to haul a heavy load on not much fuel. A few minutes with a slide rule convinced Kelly the Fokker could do the job, and he lost no time in outlining the idea to his friend, Lt. John A. Macready. It would take two men to do the flying, and Macready, a test pilot and holder of Army speed and altitude records, had the kind of time the project called for. He quickly agreed to go.

The engineering staff at McCook

(then the Air Service test center and now the "Wright" section of Wright-Patterson AFB) went to work on the technical problems-checking fuels and lubricants, mounting an extra tank, computing loads. Kelly and his partner collected maps and talked weather. At first glance the west-to-east route looked best, in view of prevailing winds. During an average October, they learned, twenty-two miles an hour of help could be expected flying eastbound, something worth thinking about with a plane that couldn't break 100 miles an hour, wide open. The joker was the mountains. The Liberty's power would start falling off as soon as the wheels left the ground, making it useless to tackle the mountains until considerable gas was burned and weight was reduced. There was a route, running north from San Diego then doubling back to the southeast and winding through low country close to the border, which followed passes and valleys of reasonable elevation, but such wanderings would add 300 miles to the already-long hop. An alternative was to start from New York and buck headwinds all the way. After a great deal of discussion the pair agreed to take the long way and use

In September of 1922 the pilots flew the T-2 to Rockwell Field at San Diego. They had visualized themselves relaxing on the beach, soaking up California sun for a few days before take-off but found the technical aspects of setting a record to be more demanding than they had thought. Long hours went into engine tune-up, map preparation, weather study, and clearing a 10,000-foot runway across North Island, matters which the pair supervised personally.

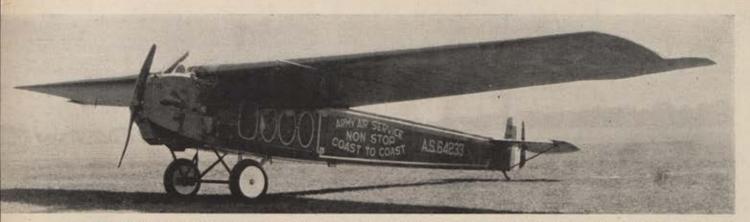
A telegram arrived on October 4, from the Washington weather bureau, forecasting almost ideal conditions along the entire route. Clear skies, westerly winds, and a full moon—a combination they had hardly dared hope for. The possibility of storms in the mountains, their greatest dread, was not even mentioned.

The T-2 was rolled out the following morning before sunrise, run up and the tanks topped off. Neither pilot had rested more than a few hours during the previous days of preparation. Kelly, winning the flip of a coin, climbed into the open cockpit, and Macready strapped himself into the cabin seat. McCook engineers had figured the T-2's performance under load to a gnat's eyelash. Theoretically, the Fokker's absolute ceiling with 11,000 pounds was the runway. Add five pounds and it would never break ground; throw out (Continued on following page)

the T-2

By Len Morgan

T-2 Fokker made first non-stop transcontinental flight on May 2-3, 1923.



In 1923, Macready and Kelly remained airborne for thirty-six hours and five minutes in this T-2 Fokker transport.

five and it would fly. To compensate for possible error in the figures, a total load of 10,695 pounds (not quite the weight of two loaded North American T-6s) was set as maximum, and now it was up to Kelly to put these calculations to the test.

He slowly ran the throttle to the stop, and the T-2 stood as firmly as if the chocks were still in place. For a moment the ship refused to budge, then it rolled heavily down the dirt strip. Just past the mile mark Kelly got the weight entirely off the wheels and found himself, as he had expected, with his hands full of airplane with little inclination to fly. Feeling the way with utmost care, he nursed the overloaded Fokker to 100 feet and into a turn to avoid Point Loma, which cost him ninety feet of altitude. The ship mushed steadily, its wheels almost touching the water before it took hold again. After two complete circles of North Island at full power, 200 feet was showing, enough to set course for the first leg of the winding path through the hills. Macready's only view of the world was through a side window, and his emotions during these first minutes aloft are best imagined.

Fifty miles out, flying north, altitude had been increased to 1,700 feet. Temecula Pass lay over the nose and beyond it the higher ground, Kelly observed with sudden dismay, sloped up into fog. At Banning the fog thickened and it was impossible to continue contact. For an hour Kelly searched for a break through which he might slip across the ridges, but the pair had to admit defeat while still almost in sight of their point of departure. Even if further search found a break in the fog, precious fuel was gone and there no longer remained a chance to clear the New Mexico mountains before dark. A "more nerve than brains" atmosphere characterized much of flying in that day, but Kelly and Macready had been around long enough to recognize the difference between calculated risk and suicide so they reluctantly swung back.

Rather than write off the whole thing as a failure they decided to try for the world's endurance record with the remaining fuel and dropped a note at Rockwell requesting an accurate timing of the flight. Flying in six-hour shifts, they flew along the coast for the rest of the day, all night and until dusk of the second day, remaining airborne for thirty-five hours, eighteen minutes—a new record, though unofficial.

It was a nice plum for the Air Service but quite incidental, as the McCook pilots viewed it, to the main job at hand. They hoped to get away quickly on a second attempt, but engine repairs and poor weather contrived to keep them grounded until mid-October. The moon was now gone, and winter with its unfavorable weather was almost on them. Twice the T-2 was positioned on the runway and twice last-minute weather reports from Washington forced further delay for the impatient pair. The break came suddenly on November 2. Conditions along the route were not perfect but appeared to be shaping up well enough for another try. Just how unreliable were 1922 weather predictions the T-2 crew was soon to learn.

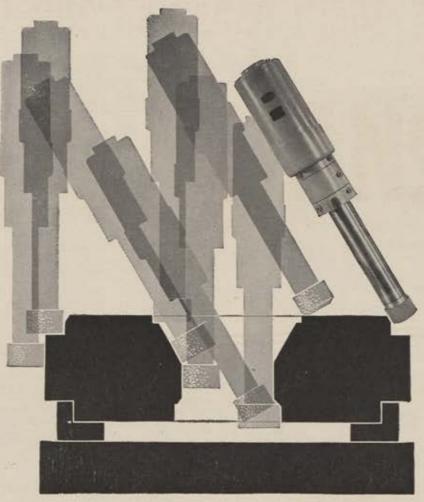
Now the big Fokker was fueled to a gross load of 10,850 pounds, 155 pounds more than the best it had ever lifted before, yet Kelly kept it climbing steadily after take-off at dawn on November 3, flying several miles out to sea before making any turns. Temecula Pass and Banning soon fell behind and a good 2,000 feet lay below the monoplane as it sped southeast across the Salton Sea. At Niland, Calif., it turned east and flew to the Colorado River where the

pilots traded seats. Dual controls in the rear enabled one pilot to keep the ship level while the other scrambled back through the narrow passageway from his open seat next to the roaring Liberty.

Rough air and rising terrain made flying increasingly difficult near Tucson, the T-2 mushing along no higher than fifty feet above the ground for long periods as its pilots sought for low points over which to continue the eastward progress. Deming, N. Mex., was crossed with 5,200 feet on the altimeter but Kelly, taking over again, kept fighting to pick up every foot the diminishing weight would allow, knowing that elevations of nearly 7,000 feet lay ahead. It was exhausting work, hand-flying the heavy craft through continuous turbulence, straining for the fine point in airspeed between climb and stall. Down currents once forced the T-2 within twenty feet of the cactus, and it nearly hit a high mound of earth as Kelly reversed course to kill an hour, burning out enough weight to permit topping the next ridges.

Numerous deviations from the intended course were made of necessity but the welcome lights of Tucumcari, N. Mex., were sighted just after dark, and the pilots headed northeast into better country with rising spirits. But an hour later clouds blotted out the moon, and Macready was forced down to tree-top level in order to retain contact. It began to rain. Forward visibility became so poor he nearly ran into farmhouses on high pieces of ground, Several times he lost the railroad he was following, and he could only stay on the compass-and out of the treesuntil it appeared again. Lightning stabbed the earth on all sides, briefly outlining the countryside with a frightening, though welcome glow. The T-2's course actually by-passed

(Continued on page 295)



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Macready and Kelly stand in front of gas and oil they used on record flight.

the worst weather that miserable night, as its crew learned later. Severe electrical storms and a tornado were taking twelve lives and causing eighty injuries on the ground even as the big Fokker ventured through the area.

At Pratt, Kan., the sky cleared and Macready turned away from the railroad to set course for Wichita, Section lines below were used to check drift. The ten-mile notations on the maps made it easy to check speed. Hours later, as St. Louis slipped by beneath the right wing, Kelly returned to the controls, adjusted his goggles, and settled down for his trick. The Liberty beside him roared without a miss. The lightened ship flew easily across the rolling country, and there was no longer much trouble in keeping right over the penciled line on the map. Through the windshield a faint strip of light promised dawn after twelve and a half hours in the dark. Back in the cabin Macready stretched out on the floor to relax as best he could and played his flashlight beam on the big map pasted on the fuselage wall. The worst was over,

Soon after passing Terre Haute the smooth flight of the T-2 through the quiet morning air was broken by a quick rocking of the wings. Macready looked forward to see Kelly handing back a note. He read it, then wormed his way to the cockpit to stare at a slow trickle of water from the Liberty's water jacket, Four hundred miles out of Rockwell Field, they had noticed a minor leak, but the water loss had seemed negligible. But now the leakage was serious and the pilots realized that no more than a few minutes of life remained in the engine. Approaching Indianapolis, Macready, back at the controls for his regular six-hour turn, saw the coolant temperature rise rapidly. Kelly was pouring all available liquids-coffee, water, and soup-into the cooling system. There was no choice left but to

land, and the T-2 rolled to a stop minutes later in the infield grounds of Indianapolis Motor Speedway.

So ended the second attempt to fly across the country non-stop. The pilots returned to their base at Dayton and fell into bed, but not before agreeing on one thing: no more record flights! Let someone else ride through thunderstorms all night, trying to find the way under a fifty-foot ceiling. Not them! Two days later when Macready awoke, Kelly was pinning maps up on the wall, and the T-2 crew was right back in business.

Two things were now certain: the next attempt must be from east to west in spite of headwinds so the plane would be light enough in the last third of its flight to cross the mountains with a greater margin of safety. Secondly, it was out of the question to try it again before spring. In the meantime, they made another try for the endurance mark.

The first time, the T-2 taxied out in front of newsreel cameras and city dignitaries, rolled fifty feet through the mud at McCook Field, and bogged down to the axle. Kelly and Macready were almost too embarrassed to get out of the plane. Later in the winter a second attempt, made with an experimental engine installed, ended abruptly at midnight in the middle of a howling snowstorm when the engine quit. Macready deadsticked the 10,000-pound Fokker into an open field without lights on the plane or the ground, which tells something of the sort of fellow he was. And it speaks well for Kelly who this time had to observe what he could from the side window. The only damage was a bent spreader bar. The final attempt on April 17 and 18, 1923, resulted in a new record of thirty-six hours, five minutes. Orville Wright served as official timekeeper.

The engine was changed and the T-2 flown to Mitchel Field for a

ABOUT THE AUTHOR

Len Morgan started flying in 1941 when he was 18—with the Royal Canadian Air Force. He served in England and Egypt before transferring to the USAAF at Cairo. After duty in the US with ATC, and as an instructor, he was discharged in 1945. In 1949 he took a flying job with an airline in Dallas. He's married, has two children, is a part-time author, and collects old aviation books.

After he wrote this article-his fourth for Air Force-Morgan gathered more information on Kelly and Macready. Kelly (now a retired colonel living in Vista, Calif.) reports: "The results of our effort with the now-famous T-2sometimes dubbed 'The Flying Billboard'-just thirty years before the first scheduled non-stop coast-to-coast commercial service, caused Gen. Mason M. Patrick (then chief of the Air Corps) to direct that 'Kelly be assigned to any Air Corps duty he desires.' This rather unusual directive." Kelly continues, "gave me five extremely pleasant years in the Pacific Northwest." This was followed by duty in the Philippines, as an instructor in the US, and more duty in Europe before he retired.

Macready resigned from the Air Service in 1926, worked for General Motors, Frigidaire, and Shell Oil until 1934. He then bought some land near Yosemite Valley in California and raised race horses and beef cattle. He was recalled to active duty in 1940 and served in North Africa and later commanded Walla Walla AB, Wash. He now lives in Merced, Calif., and operates a cattle ranch near Yosemite.

new try on the transcontinental record. California gasoline was trucked in, early McCook tests having proved it less liable to cause detonation than any other fuel then available. When everything was ready, the ship was ferried to Roosevelt Field, which offered considerably more room for the critical take-off.

Following the usual series of last-minute decisions and false starts that seem to plague all airmen bent on setting records, it was agreed, on the morning of May 2, 1923, that the weather picture was about as bright as it was going to get. Kelly, as had become the custom, was to take-off while Macready sweated it out in the cabin. Loaded again to 10,850 pounds, the T-2 began to roll at noon but it would not lift, even after running a mile. The take-off was abandoned, and Kelly taxied to an-

(Continued on following page)



other part of the grass field, lining up the nose with the hangars at Hazelhurst Field, two miles away. Roosevelt was located on a bluff and there was a twenty-foot drop-off to neighboring Hazelhurst. Kelly poured on the coal. At the end of a mile the T-2 was bouncing but not flying, and its wheels were still rolling through the grass when it shot over the edge of the bluff. Settling slightly, the Fokker raced across Hazelhurst, not quite touching the ground. The hangars on the far side of the field were coming up fast, as even Macready could see from his seat in the rear. Kelly held his foot or so altitude until the last moment, then eased the blunt nose up ever so slightly, praying the T-2 had somehow built up an extra bit of velocity that could now be swapped for the height of the hangars. The Fokker struggled painfully to forty feet, held it an instant, and sank sluggishly back to fence level-on the other side of the buildings. Actual take-off time: 12:36 p.m.

To the small crowd of well-wishers back at Roosevelt, it was a hair-raising spectacle. They watched breathlessly as the monoplane lumbered over the edge of the bluff and sank out of sight. Then they saw it skimming the ground across Hazelhurst, headed for the hangars without any apparent chance of clearing. Someone in the crowd said they would never make it, but his friend, an Army colonel, immediately bet \$5,000 they would. The T-2 staggered over the hangars and disappeared from sight beyond, leaving them to wonder about the outcome. They didn't see the T-2 again. Neither did they see the sudden flash and smoke of disaster.

Nor would they, for Kelly was still flying, miles away now. The first minutes out of Roosevelt were a nightmare of mushing wide open across the fields, trying desperately to gain enough speed to cross the next row of power lines. Macready, hardly daring to move a muscle, gazed in fascination as the wheels crossed housetops and telephone wires with almost no margin and braced for the crash that seemed inevitable. For the hundredth time he cursed himself for ever getting mixed up with Kelly in the first place, interrupting himself frequently to silently praise the Irishman for a magnificent piece of flying.

Passing over Coney Island at 300 feet, Kelly signalled Macready to take control from the rear. The extra controls were only intended for momentary use, but it was half an hour before Kelly took over again. Noticing a negative amperage reading, he dismantled the voltage regulator and adjusted the breaker points, a tricky bit of repair even in the shop. Without it, the batteries would have been drained in a short time, canceling the hop. Apparently there was some advantage in having your engine in the co-pilot's seat.

Dayton appeared at dusk, on schedule, and the pilots traded seats. Clouds appeared in the west as darkness fell, and it was necessary to descend to 800 feet to keep in the clear. Indianapolis and Terre Haute dropped behind, St. Louis would be the next definite checkpoint, although every effort was made to pick up landmarks between the cities. Sometimes it was possible to stay "found" for several hours on end, but there were uncomfortable periods when compass heading and estimated ground speed furnished the only clues to actual position. The fact that the T-2 pilots nearly always rediscovered themselves on or near their intended course reflects on their thorough preflight preparation and careful flying.

As Terre Haute fell behind them, Macready's eye caught a wink of light far ahead. As he peered through the windshield he saw it again. It occurred to him that Air Service friends at Scott Field, Ill., might have aimed their powerful searchlight in his direction in the hope of helping. Scott was still eighty miles away, but it was indeed the searchlight he had seen, and it was the only surface aid to navigation the pilots enjoyed on either of their long flights. As they roared across Scott, still low to keep out of the clouds, men below got a glimpse of the broad-winged transport before it was swallowed up in

Jefferson City, Mo., a blur of lights through the mist, was the last positive check on position until dawn. In the early hours of morning the clouds broke off, and the T-2 climbed slowly up through the moonlight to hold its heading and await the dawn at a more comfortable level. The first light of day showed Tucumcari, N. Mex., right over the nose, just where it should have been. So far, so good, but this last segment of the flight would probably be the most difficult, as both pilots knew, even though it would be flown in daylight. When Kelly gave up the cockpit seat, at Santa Rosa, N. Mex., after his long

(Continued on page 299)

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night spell at the wheel, it was already plain that the fuel load was still too heavy to permit the altitudes needed for the approaching hill country.

Much of the southwest was unsurveyed at that time, and the estimated elevations shown on the pilots' charts were often found to be much lower than they looked from the air. At 8,000 feet of indicated altitude, the T-2 was barely able to scrape across ridges marked "6,500 feet" on the maps. West of St. Johns, Ariz., Macready sought in vain for an opening in the mountainous wall that lay in his southward path to Phoenix. For an hour he paralleled the ridge with the T-2 at its absolute ceiling before finding a gap large enough to squeeze through. To his alarm he was faced with several canyons and ravines on the other side. Any one might lead to safety-or up a blind alley from which there could be no retreat. He ignored them all, electing to hug the south side of the range he had just crossed as he worked his way to the west. The wisdom of this move became apparent within a few hours when the T-2 flew out of the hills near Wickenburg, Ariz.

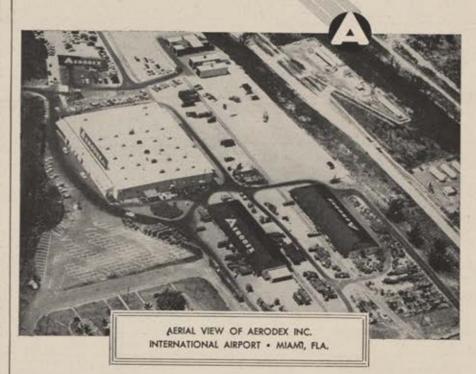
Considering what the faithful T-2 and its plucky crew had been through since the previous September, the rest of the flight was a lead pipe cinch. Kelly took over as the transport crossed the last mountains to stand in the way. From 8,000 feet he could see the broad Pacific and the dark smudge on the coast that was San Diego. Diving for Rockwell Field, he took time to make a fast run down the main street at low level and noticed thousands of people on the rooftops, waving. Then he banked into the wind and set the T-2 neatly down on North Island, twenty-six hours and fifty minutes after rolling off the bluff at Roosevelt Field in New York.

There are many happy endings to this story. The colonel won his \$5,000 and gave it to Kelly and Macready. They needed the money to help pay off the personal expenses of the flight. The T-2 did not end up on the scrap pile with so many other famous ships of its day but was flown to Washington and placed in the Smithsonian collection for all to see. It is there to this day. And the Air Service feat was, of course, frontpage news throughout the world. People everywhere were saying, "Those Army pilots can do anything!" And the truth was, they could.—End



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