AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

May 1955 • 35c

10 Years Ago...

VICTORY IN EUROPE

A look at the air war in Europe and North Africa, from one of the wartime issues of AIR FORCE

Bisons, Badgers, and Butchers—Russia's New Bombers

Seventy-Nine Hours—An Airman's Fight for Survival

in the air...

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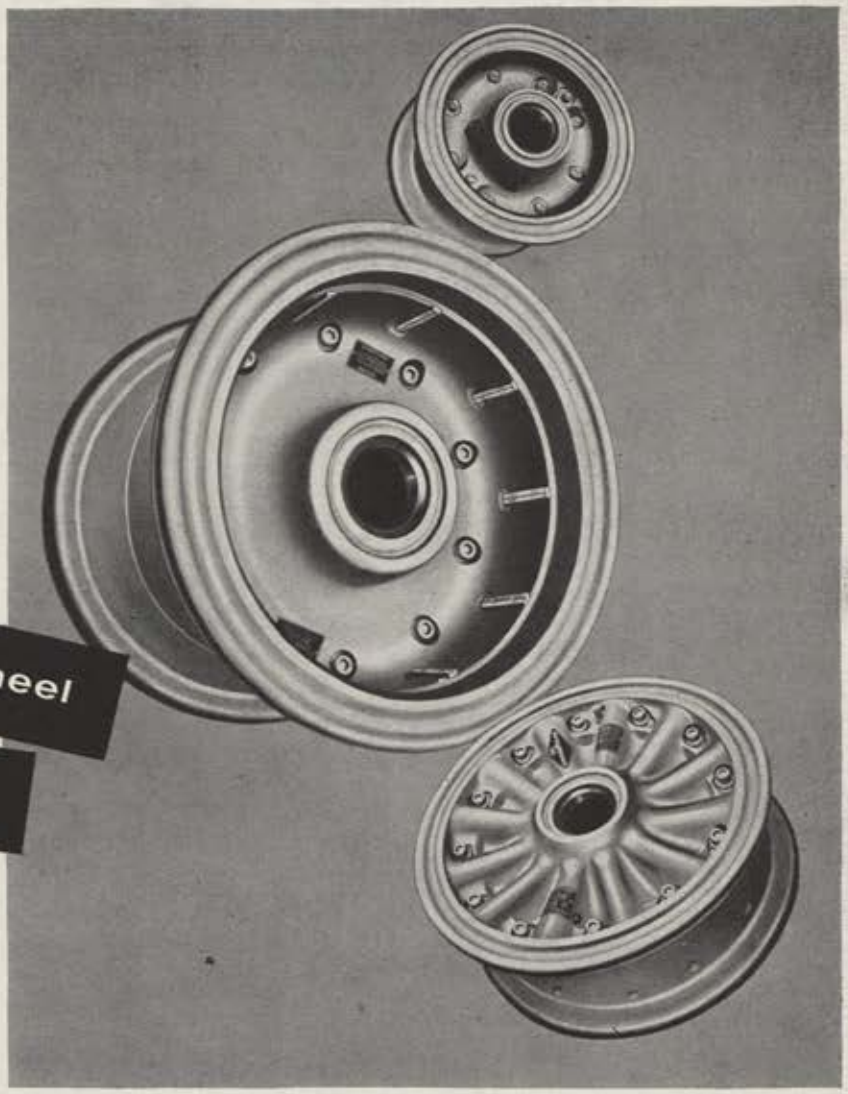
Forging ahead

IN PERFORMANCE

per-pound-of-wheel

per-pound-of-load

per-roll-mile



New Forged Airplane Wheels by Goodyear are delivering greater strength at spectacular weight-savings to the aeronautics industry.

The forged airplane wheel is the latest laurel to be added to the list of Goodyear achievements in the advancement of the efficiency of the airplane wheel.

Our pioneering work in forged magnesium wheels was undertaken to deliver wheels of record capacity per pound, greater "roll life" to meet the special needs of specific aircraft, such as long-range commercial, military, and particularly jet aircraft – "where every ounce and every pound counts!"

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And by the very fact that we turned to forgings to get uniform quality and grain-flow, we were led to simpler wheel designs – which have turned out better than even the finest "gingerbread" castings! As a result of superior die-design – and exacting quality control from billet to finished product–Goodyear's new forged wheels eliminate fatigue "footholds" by the very excellent simplicity of their contours.

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If the aircraft you are presently designing needs further weight reduction and demands consistently high wheel roll life–then you would do well to get the full facts on forged wheels, another pioneering advancement of Goodyear, Aviation Products Division, Akron 16, Ohio or Los Angeles 54, California.

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PRODUCTS

FACILITIES + ABILITIES = EXTRA *plus* IN PERFORMANCE

NEW TANKERS GIVE JET

Boeing and Lockheed Receive Awards in Air Force Tanker Competition

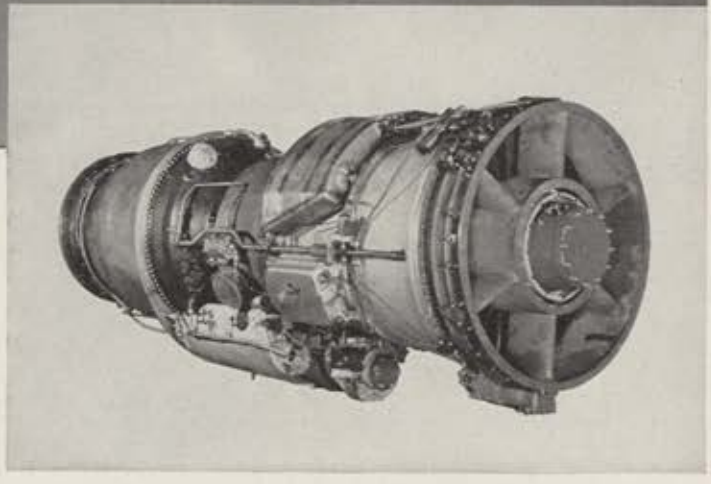
Intercontinental range for high-speed jet bombers and fighters will be assured by new jet-powered tanker-transports, the result of a major industry-wide competition.

These tanker-transports are Boeing Airplane Company's KC-135, which has been ordered into production, and a new Lockheed Aircraft Corporation tanker on which design and development engineering has been authorized. The Boeing tanker-transport was designed around four Pratt & Whitney Aircraft J-57 turbojet engines.

With efficient, high-thrust engines, these modern tanker-transports will be able to deliver tremendous fuel loads to big jet bombers and fighters flying at combat speeds and altitudes. They will be practical—and essential—additions to America's air strength, giving global "reach" to her combat aircraft wherever they must fly.

GLOBAL "REACH" for jet bombers like Boeing B-52s and B-47s, and for long-range escort fighters such as McDonnell's F-101, will be assured by a new generation of tanker-transports. The first will be Boeing's KC-135, winner of a major industry competition. It will be powered by Pratt & Whitney Aircraft turbojet engines.

BOMBERS GLOBAL "REACH"



NEW JET TANKERS ordered into production are Boeing KC-135s. They will be similar in appearance to this sleek and modern tanker-transport prototype, the Boeing 707. Four advanced Pratt & Whitney Aircraft J-57s, shown at right, will power them. Refueling tanks can be removed quickly when the aircraft are needed for other cargo missions. Production and operation of the new aircraft will be of major significance throughout American aviation.

Pratt & Whitney Aircraft

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air mail

"For the Record" Department

Gentlemen: 'Twas a nice account in the last AIR FORCE Magazine about Vidal and Condon ("Ready Room," April '55). One item, however, is erroneous. I am not "rotiring." I am being relieved (by request) from active duty. In other words, I revert to an Inactive Reserve Status.

No sweat over the reference save I would like the record correct for any possible future mention.

Brig. Gen. Robert E. Condon
Mitchel AFB, N. Y.

Gentlemen: Thanks for your splendid article in the March issue about the Third Air Force information program "On Target."

However, I should like to put the record straight on a couple of items. First of all, credit for the writing of the scripts should be given to Jack Briley alone, rather than in conjunction with George Lehr and myself. George and I are kept busy rounding up props, interviewing prospective actors, setting up the schedule, and all the other minutiae of administrative apparatus . . . with an assist from Lt. Milt Hanson.

Item two: Capt. Don Bell, Chief of the OIS here at headquarters, Third Air Force, deserves a pat on the back for the way he steered us through the difficult waters of communication channels, no mean task for a project so new and (at that time) untried as "On Target."

1st Lt. Wilson P. Brydon
Hq. Third Air Force
APO, New York, N. Y.

Gentlemen: I note with a great degree of concern your omission of the C-119 activities in support of 18th Fighter-Bomber Wing move to Formosa (see the March issue of AIR FORCE, page 38, the article entitled "Fighter Bombers on Formosa"). The C-119 aircraft of this wing flew more hours, more sorties, and airlifted more tons of cargo than did the C-124 aircraft in support of this move to Formosa. The classified nature of the project prohibits revealing specific figures, however records in this theater will factually support my contention. Additionally, I personally know that our ground maintenance crews and aircrew members as well as the C-124 personnel worked around the clock to support this operation.

In addition, aircraft from this wing were the first to land and off-load cargo and personnel in Formosa in support of this move. As in the past this wing again demonstrated its well-known "Can Do" spirit by providing safe and timely airlift to military units throughout the Far East theater of operations.

This letter is written to you with the thought in mind that future articles will correctly portray *all* factual information and not just one side of the picture. In other words, give due credit to all participating organizations.

Lt. Col. Alonzo W. Parrott
Hq, 483d Troop Carrier Wing (M)
APO, San Francisco, Calif.

• *We didn't intend to slight the part the hard-working men of the 483d Troop Carrier Wing played in the redeployment of the 18th Fighter-Bomber Wing, but we—like other publications—can only print the pictures we have. FEAF sent us shots of F-86s and C-124s, and we printed shots of F-86s and C-124s. Perhaps Colonel Parrott's outfit was so busy airlifting cargo that no one had time to snap a few photos.—The Editors.*

Point of View

Gentlemen: I think I know what Edward J. Carlin, Jr. ["Jet Blasts," December '54], was driving at in his reference to West Point graduates—their point of view.

I had considerable experience with the boys from Stewart Field, the airfield of West Point, while stationed at Lockbourne Air Base, Columbus, Ohio, during World War II. This was a B-17 transition field and we drew a considerable number from The Point, which happens to be across the Hudson from where I now live.

As editor of the base news and chief of news in Special Services at LAAB, I was asked one day if I would help out the Point boys in preparing a poop sheet for them.

I cut the stencil from copy furnished by the young lieutenants. And I can still vividly recall the single theme throughout—The Point. The sheet was composed of notes from graduates now on duty at many scattered points and areas. Each told of problems of command and training. All referred to the CO, squadron, unit, or base. And each CO was rated on his training and if he was from The Point.

I had been a newspaper man for twenty years and nothing surprised me. But I did wish to take some of these lads into a back room and tell them the facts of life—that Air Force was made up of the greatest cross-section of America of any arm of the military.

There were young, young men and older men; there were fellows who could not read or write but who were expert mechanics; there were boys from the mountains who had no education to speak of but who were armament experts and who could handle every gun on every ship with precision and ease.

I would have explained to them also that the easy formality that existed among all personnel was because of the very nature of the service itself. Air Force was totally different because of constant hazard, from the first time a cadet went upstairs until he moved into combat areas.

I know, of course, that many of the West Point boys who passed through Lockbourne went on to sterling records in combat. But that did not alter the fact that their viewpoints regarding fellow officers and command personnel were wrong. Their measuring rod of: "Is he from The Point?" was un-American and most unfortunate.

F. E. Kenny
Ossining, N. Y.

A Parable

Gentlemen: With all the hullabaloo going around about airports being moved farther from cities, jets making too much noise and scaring chickens out of their normal egg-laying capabilities, etc., I thought the enclosed clipping from the November-December 1954 issue of the *New Jersey Flight Log* quite apropos. We have lots of "dragons" in the US.

Irv Zeichner
Atlantic Highlands, N. J.

ATTENTION CITIZENS!

Once there was a small town living in the shadow of a menace. The woods nearby were full of dragons; not the walking kind, but winged, fire-breathing monsters.

Everyone in the town knew the dragons were there, because the beasts made all

(Continued on page 7)

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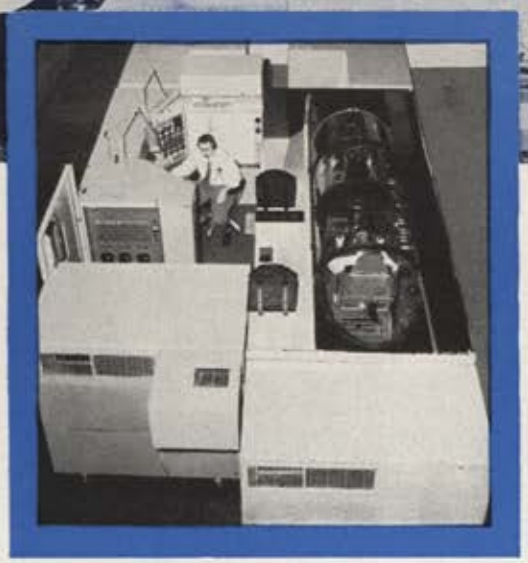

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sorts of noises, and occasionally one of them would venture forth and gobble up some unfortunate living near the woods.

Soon the king heard about this, and sent a messenger to the town, offering help. "I will send some armed knights," the king said. "They will defend you against the dragons."

But the town was noted for its quiet gardens and green lawns, and the thought of the stillness disturbed by the clang of armor was repugnant to the people.

"The knights will be noisy, and drink mead all night long," some said. "They will have to live somewhere, and who wants a barracks in this town?" said others. "A few would be bad enough, but the presence of a whole Company will surely make our beautiful property worthless," said still others.

So the messenger went back to the king and told him of the attitude of the town. The king was sorry, but he respected the will of the people.

One night, all the dragons got together and attacked the town. They made much more noise destroying the town than the knights would have made defending it, and when morning came and the last dragon headed back to the woods the property in the town was indeed worthless.

But nobody in the town protested. They were all dead.

Those Ads!

Gentlemen: I have been a charter member of AFA since its very first breath was drawn. I have been an avid reader of AIR FORCE Magazine. But—and I say this with dejection—this once-fine report on our airpower has become an advertiser's catalogue. Admittedly, some of these ads make good reading and hold considerable information, but I'm not in the market at the moment for, say, hydraulic equipment. I'm sorry to complain but I do object to hunting through advertisements to find an article. Keep up the good work on the type of story you do run.

R. A. Bracht
Hawthorne, N. J.

• *This is a problem that is not unique with* AIR FORCE. *The vast majority of magazines in this country rely to a great extent on advertising for the income that makes good articles possible. Some of our readers, comparing the present magazine with its wartime predecessor, are inclined to forget that the World War II* AIR FORCE *Magazine was published with government funds, with a ready-made staff supplied by active-duty personnel. Now we have to pay our own way, and advertising is the means by which we do so. Actually, as a perusal of back issues will indicate, an increase in advertising means an increase in editorial reading matter, as the amount of advertising governs the total size of any given issue. If we carried fewer ads we'd carry fewer articles.—The Editors.*

They're People First

Gentlemen: I feel prompted to give a boost for the article on Frank Luke by James Law [March '55].

It is not only that it has personal associations since I was a pilot at St. Mihiel in the 8th Aero Squadron at the time Luke was making his career, but armed forces are all preeminently people first and machines second.

Without heart, pride, and morale, no armed force is effective. The drama of life reaches its climax in the human emotions and decisions surrounding the acts of killing and being killed.

The old *Liberty* magazine had a long series on von Richthofen and there is endless material in the pilots of the Royal Flying Corps. The mechanical, organizational, and political contents of AIR FORCE Magazine could well be supplemented by a definite policy of including a percentage of human interest and historical articles—aimed at the heart.

Charles E. Whitehouse
New York, N. Y.

Nonsense or Right Method?

Gentlemen: I read with some amusement your report on the NCO Academy ("School for Zebras," April '55). Apparently the Alice in Wonderland stuff is still with the Air Force, despite its fairly successful efforts to shuck off the bad parts of its parent service.

Seems we are trying to out-shoe-shine the Russian and Asian counterparts. Didn't read about shoe shines in the reports of the Korean war.

What with all the yakking about reenlistment rates, nobody but nobody has ever thought to analyze the spit-and-polish idiocy thrust upon every military man jack. So who cares whether Sergeant A shines like mad and lines up the footlocker with a spirit level just so long as he can shoot straight, fix a radio, or administrate with intelligence? The business world which backstops and supports dear old USAF doesn't feel that drum and bugle corps are necessary to produce planes, et cetera, so how come the die-hard nonsense in the area of unrelated drivel? Isn't it just possible that this nauseating activity is directly responsible for the lousy re-upping scores? Any vet knows that the pay is pretty good today, the conditions of work not dissimilar with industry, and the long term rewards far better. Does it take a genius to surmise that the niggling, autocratic, unnecessary, minute inspection system must go?

Any intelligent human being knows he must dress well, keep shaved, and live in respectable quarters in order to get ahead. The Air Force gets a very high percentage of high IQ boys. So why does it still treat 'em like Jukes family offspring?

I suggest we let our airmen get on with their jobs and relegate the pomp and circumstance to the Civil War Zouaves.

Edward J. Carlin, Jr.
Philadelphia, Penna.

Gentlemen: Thank you for the fine article "School for Zebras" in the April issue. I firmly believe that unless airmen are trained, no amount of money in the form of bonuses or raises will keep the "leaders" in the service.

No doubt many of the men shown in your fine article served during the time when the pay scale was not up to its present standard and bonuses as we know them today were unheard of.

The Strategic Air Command's NCO Academy program is a step in the direction towards an Air Force built of a corps of professional men rather than someone who is afraid of the word "soldier." Placing entrance exams on a competitive basis would most certainly prove wherein lies the heart of some of our "career" people vs. the guy going along for the ride towards his early out and/or early retirement. Possibly rank would be earned rather than handed out to undeserving and unqualified individuals.

Let's get rid of the "namby-pamby" who is afraid of being soldierly, back our NCOs to the hilt; then and only then can the hard core of professional airmen climb to deserving heights. You won't have to worry about the sagging enlistment rate then.

S/Sgt. Wesley Bright, Jr.
Suffolk County AFB, N. Y.

Gentlemen: Please permit me space to comment on Henry S. Tugender's letter in your April issue. Tugender's plaintive bleat was aimed at "Bootstrap or Blackjack," by Lt. Col. Edward R. Kandel (December '54 AIR FORCE).

Colonel Kandel didn't object to education as such. But he did object to "the over-emphasis on the importance of a college degree in the liberal arts or the quasi-scientific courses, such as 'bachelor of military science.'"

Nor did the good colonel himself say a college degree might be detrimental to education. He merely quoted the opinions of world-famous Dorothy Canfield Fisher, author and educator, and Arthur Coleman, president of Alliance College.

More recently, Dr. Douglas Bush, of Harvard College, in an article in the *New York Times,* substantiated Colonel Kandel's main point by stating that only students with a motive should be admitted to college.

Bluntly, the tough-minded professor said he would refuse admission to anyone attending college for economic or social advantage; for four years of idle diversion; or as entrée to a better position.

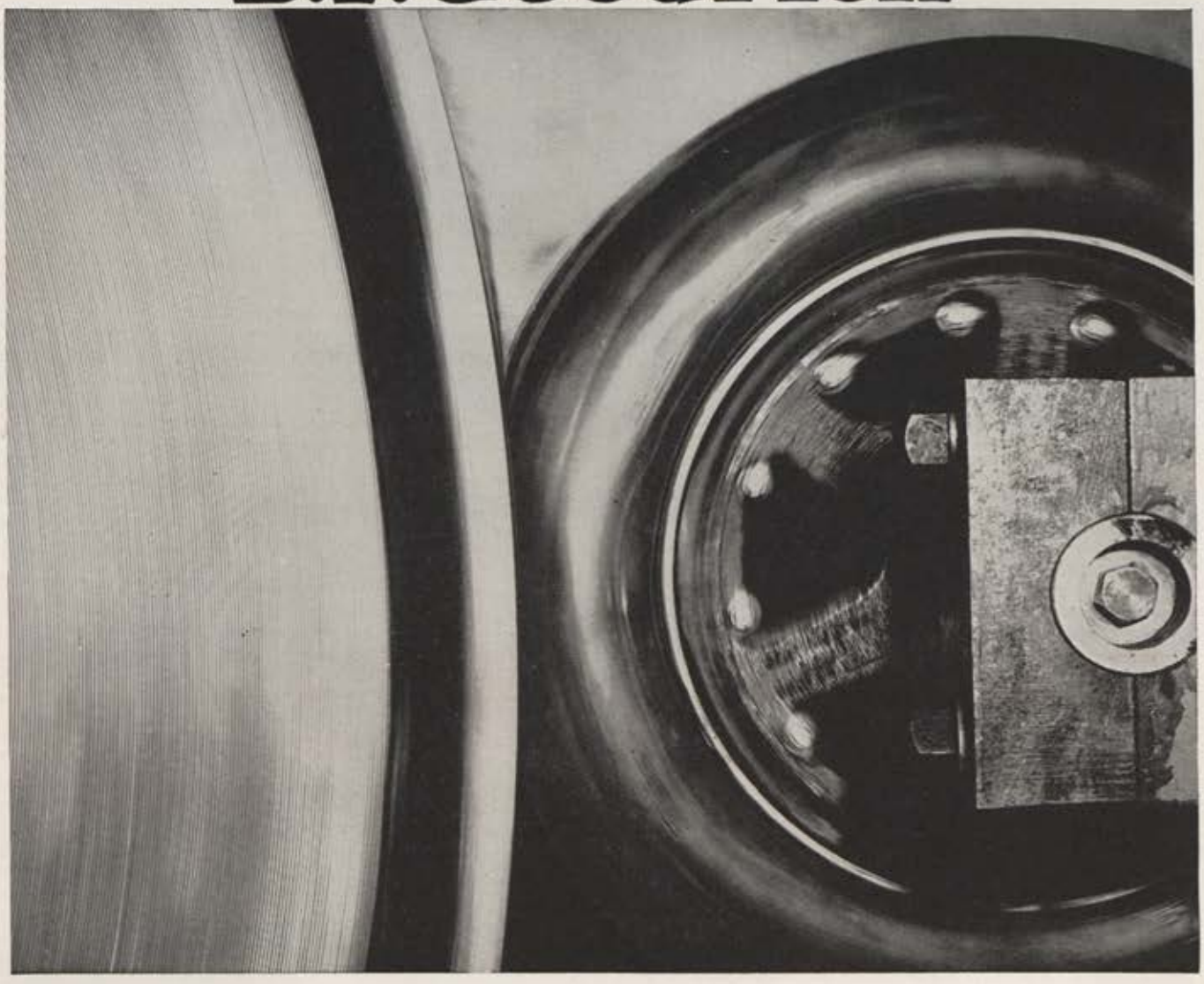
"The public must be convinced," Doctor Bush said, "that higher education or what passes for that, is neither a birthright nor a necessary badge of respectability. Useful and happy lives can be led without a college degree. As things are, we have an army of misfits who lower educational standards and increase expense."

Our Harvard professor really pinpointed the main evil of mass education, placed it in its proper perspective.

As Doctor Bush said, "The principle of education for all leads ultimately to education for none."

Dick Bissonette
Washington, D. C.

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



World's first 300 mph airplane tire –and it's B. F. Goodrich Tubeless!

B. F. Goodrich, inventor of the Tubeless Tire, announces a great new aviation advance—the world's first 300 mph airplane tire. Developed for ultra high speed military use, the new Tubeless Tire established the record for a high speed landing on B. F. Goodrich's new 300 mph dynamometer in Akron, shown above.

To simulate the complex stresses of actual landings, this new B. F. Goodrich 300 mph Tubeless Tire was set to hit the dynamometer's flywheel at an angle. Slammed against the whirling flywheel under 10,000 lbs. load, it instantly developed speeds up to 4,000 rpm—a combination of impact, friction and centrifugal force that would disintegrate an ordinary tire. After this 300 mph landing, the new Tubeless Tire showed no sign of failure. More landings were made, surpassing requirements for the tire. And even after 14 straight landings at 300 mph, the tire was good for more.

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This new 300 mph Tubeless Tire is another example of B. F. Goodrich leadership in Tubeless Tire research and development. *The B. F. Goodrich Co., Aeronautical Sales, Akron, Ohio.*

B.F.Goodrich
FIRST IN RUBBER

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AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

Volume 38, No. 5 • May 1955

FEATURES

DEPARTMENTS

THE COVER

This month marks the tenth anniversary of V-E Day. The event is symbolized on our cover by the picture of a POW being flown home on an evac plane. T/Sgt. Roger Coster took the photo, which first appeared in the July '45 issue of this magazine, then the official journal of the AAF. The POW, Lt. Harmon Smith, was a navigator whose plane had been shot down in January 1944 while on a mission over Germany. The USAF couldn't give us a line on Smith's whereabouts. Any help from our readers? For more on the victory in Europe, see page 65.

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- AN/GRC-27 TRANSMITTER AND RECEIVER

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By Wilfred Owen

An eighty-three-pound muffling device is reported to eliminate sixty percent of the take-off and landing noise of a helicopter.

° ° °

The first transcontinental air mail flight was completed thirty-four years ago. The mail plane left San Francisco at 7:29 a.m. on February 22, 1921, and landed at New York at 4:50 p.m. the following day.

° ° °

The $60 million passenger terminal development planned by the Port of New York Authority at Idlewild Airport will include ten terminal buildings capable of handling 160 aircraft at one time. Total floor space will be as great as the area of the new terminal buildings at San Francisco, Miami, St. Louis, and Pittsburgh airports combined.

° ° °

When an airliner takes off from La Paz, Bolivia, passengers experience a one-mile drop in altitude as the plane is climbing. The air field is more than 13,000 feet above sea level, but by the time the plane reaches 20,000 feet the "altitude" inside the pressurized cabin has been reduced to 8,000 feet.

° ° °

A power line inspector in a helicopter covers 800 miles of line per week compared to about forty miles by foot patrol.

° ° °

A Wisconsin professor has demonstrated that a long straight runway is unnecessary. Tying one end of a rope

to a quick-release device on the wing of his plane and the other end to a barrel frozen in a Wisconsin lake, the fifty-three-year-old professor took off in a circle four times to prove his point.

° ° °

Bell's new VTO plane that goes straight up and down while in a normal horizontal position has been described by Bell Aircraft's President Larry Bell as "the most significant single development in aircraft flight since the Wright Brothers." The new jet plane has undergone numerous test flights at Niagara Falls, N. Y.

° ° °

Air ferry service across the English Channel has been operating since 1948. A total of 108,000 motor vehicles has been flown between England and the Continent. The ferrying business is so big that the three British airfields operated by Silver City Airways account for twice as much freight tonnage as all the other forty civil airports in the United Kingdom.

° ° °

Regular helicopter freight service is provided between London Airport and Gatwick by British European Airways.

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AIRPOWER IN THE NEWS

■ In an unusual burst of speed, Congress approved the **Career Incentive Act of 1955** and rushed it to the White House in time for the pay raise to become effective on April 1.

For the Air Force, the bill means that every man in uniform except airmen serving their first two years and officers in their initial three years of service will receive an **increase in base pay.** As an example of how the pay favors those with the most service, an airman first class with more than eight years of service will receive **an extra $57.10 per month** in base pay. A man in the same grade, but with only two years of service will get an increase of $18.10 per month. If you're in uniform, here's what else it means to you:

- More of your **TDY expenses** will be paid. Per diem allowance jumped to a maximum of $12 per day.
- When you are ordered to a permanent change of station, you will receive a **"dislocation allowance"** equal to one month's quarters allowance if your dependents accompany you. (Assuming that you are otherwise entitled to have them accompany you.)
- **Hazardous-duty pay**—If you are on flying status as a crew member, your flight pay is based on a percentage of your new basic pay. This will amount to about **fifty-one percent** for an airman 3/c to **sixteen percent** for major generals. For non-crewmen, performing other hazardous duty, the new pay has jumped ten percent over that paid under the old pay scale. This hazardous duty includes those for which extra pay was given under the old scale such as parachuting and demolition work, and also provides for men participating in **low pressure** and human **acceleration-deceleration** experiments.
- If you own a **trailer,** you will receive twenty cents a mile for its shipment. (You may elect the dislocation allowance instead if you are making a short move.)
- Besides the increases to which they are entitled by the provisions of the bill, **lieutenant generals** will receive an additional **$100** and **generals an additional $200 per month.**
- **Retirement**—Percentage of pay for those regularly retired will be figured on the new base pay scales. All other retired persons receive a **flat six percent** increase.

In spite of the fact that the increase will add about $745,000,000 to the annual military payroll, the bill met with surprisingly **little resistance** even from usually economy-minded Congressmen. This was probably because the value of the men the services were losing was many times that figure. Officials feel that if the act is effective in keeping men in uniform, **it will represent a big economy.** As one officer in AF Personnel put it, "If the pay raise doesn't have a favorable effect on the reenlistment rate, we've been on the wrong track all along."

■ A mock **H-bomb attack** will be made on fifty key American **target cities** on June 15-17 to test civil defenses against thermonuclear weapons. For the test, President Eisenhower and 15,000 Federal workers will **stream out of Washington** and operate the government for two days at secret headquarters. Some key officials and Cabinet officers will be notified that they are out of action as **"casualties,"** and they will be replaced for the duration of the exercises.

■ The **Convair Division** of **General Dynamics Corp.** has engaged a top-flight team of **fourteen world famous scientists** to act as **consultants** in the development of aircraft, missiles, nuclear research, and nuclear power-plants. The group includes men who are authorities on atomic weapons, missiles, electronics, aerodynamics, mathematics, metals and astrophysics. They are especially well qualified to participate in the design of an **intercontinental guided missile** such as the **Atlas,** now in development at Convair, although the announcement did not specify the type of missile the group will work on.

Among the group are: **Dr. Theodore von Karman,** authority on aeronautics, long-time Chairman of the AF's Scientific Advisory Board and now **Chairman of NATO's Advisory Group on Aeronautical Research and Development (AGARD); Dr. Edward Teller,** nuclear physicist at the University of California and one of the principal brains behind **development of the H-bomb;** and **Dr. Hans Albrecht Bethe.** Dr. Bethe, considered one of America's leading nuclear theorists, was with the Cornell Scientific Laboratory of Nuclear Studies and director of the Theoretical Physics Division of the Los Alamos Laboratory, N. M. Others in the group: **Dr. Kenneth M. Case,** nuclear physics; **Dr. Lan Jen Chu,** electronics; **Dr. Charles Louis Critchfield,** nuclear physics; **Dr. Milton S. Plesset,** aerodynamics; **Dr. Frederick Seitz,** metallurgy; **Dr. Fred L. Whipple,** astrophysics; **Dr. Robert F. Mehl,** metallurgy; **Dr. Peter D. Lax,** mathematics; **Dr. Mark M. Mills,** nuclear physics; **Dr. John A. Wheeler,** nuclear physics; and **Dr. Richard Courant,** mathematics.

■ The **Strategic Air Command** celebrated its ninth birthday in Omaha with pretty movie star **June Allyson** cutting the cake. The celebration coincided with a world premier on March 25 of Paramount's new Film **"Strategic Air Command,"** starring **James Stewart, Miss Allyson,** and **Frank Lovejoy.** The premiere, sponsored by the **Air Force Association** and **Paramount Pictures,** was part of a two-day affair that included a reception at **Offut AFB,** a briefing for the press by the SAC staff, a static aircraft display, and a low-level flyover by a KC-97 refueling a B-47 Stratojet.

At SAC's ninth birthday party in Omaha, movie actress June Allyson cuts the cake while Gen. Curtis E. LeMay, commanding general of SAC, and John R. Alison, President of the Air Force Association, stand by to give it a try. (We couldn't find any more than eight candles either.)

■ The Air Force's first squadron of **RF-84** Thunderflash reconnaissance fighters equipped to operate from **RB-36** bombers has been activated at **Great Falls AFB, Mont.** The **91st Strategic Reconnaissance Squadron,** SAC, was scheduled to receive the first of the specially equipped fighters in April. They will team up with bombers of the **99th Strategic Reconnaissance Wing,** based at **Fairchild AFB, Spokane, Wash.** Under the development known as **FICON,** the giant bomber serves as a carrier for the smaller plane, greatly increasing the fighter's range. The RF-84s are also capable of performing the conventional reconnaissance mission under their own take-off and landing power.

■ **Glenn H. Curtiss, Jr.,** son of the aviation pioneer, has donated a valuable **collection of pioneer aviation material** to the **Air Force Museum** at Wright-Patterson AFB, Ohio. The collection, composed of **2,500 items,** includes photographs, trophies, original sketches of inventions and components of early Curtiss aircraft. In accepting the collection for the Air Force, Secretary of the AF Harold E. Talbott told Mr. Curtiss that it would be "invaluable in acquainting the public with the

(Continued on following page)

outstanding contributions made by your illustrious father to early aviation." The elder Curtiss, considered one of the greatest names in pioneer aviation, died in 1930.

The Air Force Museum recently became a command responsibility of **Gen. Edwin W. Rawlings,** Commander of the Air Materiel Command. Nearly **a million persons** viewed Air Force Museum properties last year, displayed not only at Wright-Patterson, but at other museums and exhibits throughout the United States. Besides supervising the establishment of museums at various air bases throughout the US, the Museum also helps collect items for the **National Air Museum** of the **Smithsonian Institute,** and for the **Air Force Academy Museum,** soon to be established. Display items from the Museum are **loaned to educational institutions** and other organizations for training and educational purposes.

■ **Robert T. Ross** has been sworn in as **Assistant Secretary of Defense for Legislative and Public Affairs,** replacing **Fred A. Seaton** who went to the White House as an assistant to President Eisenhower. Ross, a 51-year-old former Congressman from New York, had been at the Pentagon for a year as Deputy Assistant Secretary for Legislative Affairs. A former newsman, **Lorne Kennedy** of Omaha, Nebr., succeeds Ross in that assignment. (See cut of Ross at right.)

■ **David C. Moore,** former Air Force combat intelligence officer, has been named **Special Assistant to Roger Lewis, Assistant Secretary of the AF for Materiel.** Moore resigned his executive post with **International Business Machines Corp.** where

A proposed identification system to make civil aircraft more easily identified replaces wing numbers with 12-inch side numbers. Here a Piper Tri-Pacer tries them on.

he had been for twenty-one years to take the new job. During World War II he served with the **14th AF** in China and India.

■ Proceeding full speed on development of an **atomic airplane,** the Air Force now has three major power-plant manufacturers working on an atomic engine, and three major airframe manufacturers working on the airplane to carry it. In March, a major contract was awarded to **Curtiss-Wright Corp.** for design studies "for the application of atomic power to the propulsion of aircraft." **Pratt & Whitney** and **General Electric** had previously received similar contracts, while **Convair, Boeing,** and **Lockheed** are working on airframes that would shield the crews from radiation.

■ The **Daedalian Trophy** for 1954 was awarded to the **Military Air Transport Service** on April 16. The silver cup is awarded annually to the AF Command flying more than 100,000 hours with the **lowest adjusted accident rate** during the calendar year. In 1954, MATS recorded its lowest accident rate in 6½ years of operation—**seven accidents per 100,000 flying hours.** In over-ocean operations, MATS recorded a new low of only two accidents per 100,000 hours. The award was established in 1937 by **The Order of Daedalians,** an organization of World War I pilots. USAF Headquarters won the trophy in 1953.

■ A distinguished military career will come to an end with the retirement on May 31, of **Gen. Benjamin W. Chidlaw,** 54, Commander of the Air Defense Command and the Continental Air Defense Command. A veteran flyer, and a 1922 graduate of West Point, General Chidlaw played a big role in development of the first American jet airplane. **Gen Earle E. Partridge,** Commander of Far East Air Forces will succeed him, and **Lt. Gen. Laurence S. Kuter,** Commandant of the Air University, will go to FEAF.

Robert T. Ross, new Assistant Secretary of Defense for Legislative and Public Affairs.

■ **PERSONNEL** . . . Consideration is now being given to the **inter-service transfer** of Army, Navy, Air Force, and Marine Corps officers. Before a final decision can be made, many details such as leave credits and promotion list precedence have to be ironed out.

■ **New pay days** for the Air Force are the **fifteenth and last day** of each month instead of the fifth and twentieth test dates that went into effect last October. The option of electing once-a-month pay given to officers, has now been extended to master, tech, and staff sergeants.

■ **STAFF CHANGES . . . Col. Daniel F. Tatum** has replaced **Brig. Gen. Edwin S. Chickering** as Deputy Chief of Staff, Operations, 9th AF, TAC. General Chickering now commands the 405th Fighter-bomber Wing, Langley AFB, Va., replacing **Brig. Gen. Charles D. Jones . . . Col. John R. Roche** has replaced **Brig. Gen. Cecil H. Childre** as Deputy Chief of Staff, Operations, 18th AF, TAC. General Childre is new commander of the 463d Troop Carrier Wing, (M), Ardmore AFB, Okla., replacing **Col. George L. Holcomb . . . Maj. Gen. Jacob E. Smart** will replace **Maj. Gen. Robert W. Burns** as the Assistant Vice Chief of Staff, Hq., USAF, on or about June 15. General Burns becomes new commander of the Air Proving Ground, Eglin AFB, Fla., on July 1, replacing **Maj. Gen. Patrick W. Timberlake.** General Timberlake will become Commander of Allied Air Forces, Southern Europe, replacing **Lt. Gen. Laurence C. Craigie** who will retire . . . On April 20, **Brig. Gen. Charles H. Pottenger** became Chief, War Plans Division in the office of the Deputy Chief of Staff, Operations, Hq., USAF. He replaced **Brig. Gen. Harvey T. Alness** who became Assistant Deputy Director of Plans, DCS/O. General Alness will become Deputy Director on or about June 6 when **Maj. Gen. Hunter Harris, Jr.,** leaves that post to become Deputy Chief of Staff, Operations, FEAF . . . In April, **Maj. Gen. Harlan C. Parks** became the Senior Member of the United Nations Military Armistice Commission, APO 72, San Francisco, Calif. He had been Commander of the 3380th Technical Training Wing, ATC, Keesler AFB, Miss . . . On May 1, **Maj. Gen. Wiley D. Ganey** became Deputy Commandant of the National War College, Fort Lesley J. McNair, Washington, D. C. He had been Director of Operations, DCS/O, Hq., USAF. New Director of Operations is **Maj. Gen Kenneth P. Bergquist,** formerly Deputy for Operations. Hq., ADC, Ent AFB, Colo. He assumes his new duties on June 30 . . . On May 15th, **Brig. Gen. Thomas L. Bryan, Jr.,** becomes Vice Commander of the Wright Air Development Center, ARDC, Wright-Patterson AFB, Ohio.—END

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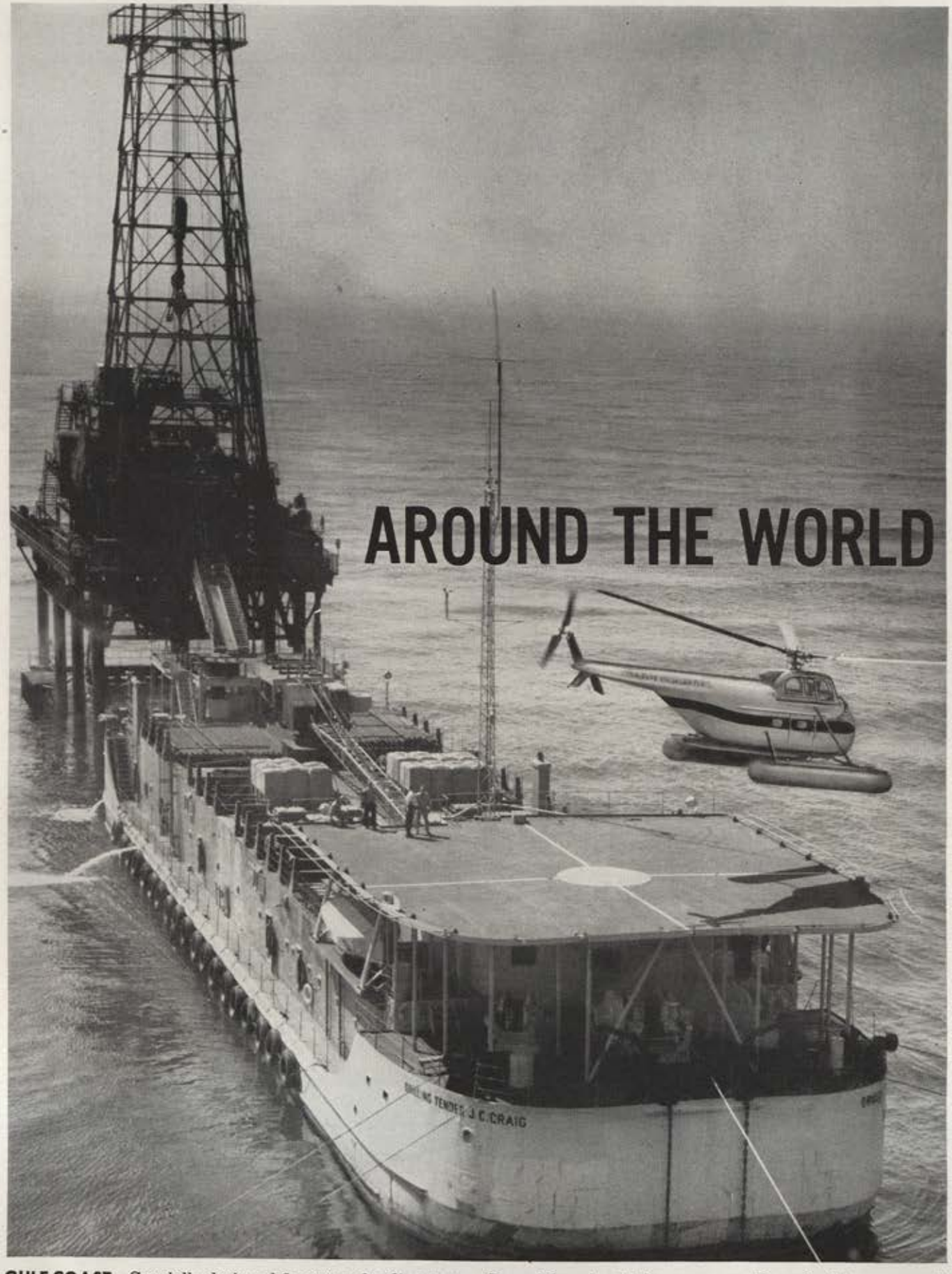


GULF COAST—Specially designed float-type landing gear, pictured here, is now available for commercial Sikorsky S-55 helicopters regularly used to fly men and equipment between the mainland and oil well drilling rigs offshore. It weighs about the same as the wheel-type gear it replaces, which means S-55s so equipped can carry their normal large loads. These S-55s can land on water or marshes, on regular heliports, or on platforms at sea.

SOUTH AMERICA—Maps needed for civil development in South America will result from an Inter-American Geodetic Survey to be undertaken soon. Five U. S. Army Sikorsky H-19 helicopters will be used on the project. The big red and white Sikorskys will work in ten South American countries. Similar surveys in Alaska are planned.

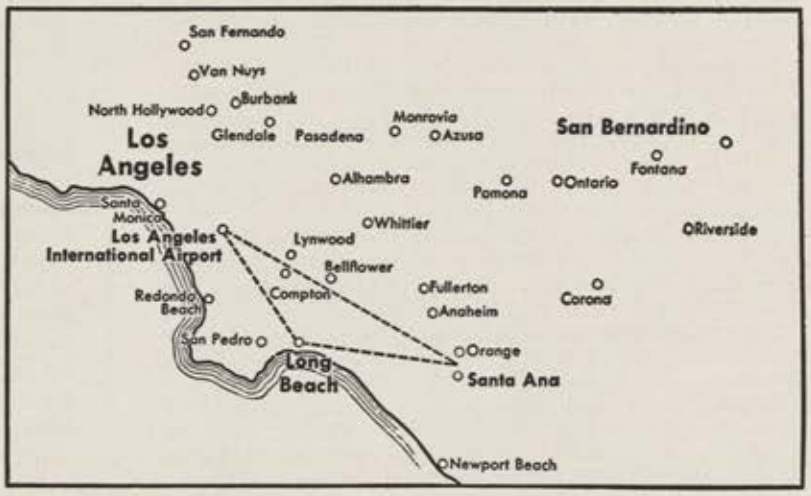
SWEDEN—In Stockholm, air experts from Finland watch Ostermans Aero, Ltd., a pioneer commercial helicopter operator, demonstrate rescue techniques with a big Sikorsky S-55 helicopter. Ostermans plans to begin helicopter passenger service soon between Malmo, Sweden, and Copenhagen, Denmark.

WITH SIKORSKY HELICOPTERS

HELICOPTER HISTORY:

Flotation Gear Pioneered by Sikorsky's VS-300

EARLIEST USE of flotation gear on helicopters was on Sikorsky's historic VS-300, the first successful American helicopter. This picture made at Stratford, Connecticut on April 17, 1941, shows Igor Sikorsky at the controls of the VS-300. It had three rubber floats. Later versions used two long floats, similar to those on today's S-55s.



CALIFORNIA—Los Angeles Airways' passenger service with Sikorsky S-55 helicopters now has been extended deeper into Southern California. A new route connects Santa Ana and Orange with Long Beach and the Los Angeles International Airport. Passenger service as far east as San Bernardino is planned by early summer, and to more than a score of other cities around Los Angeles (see map) by the year's end.

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SHOOTING THE BREEZE

WITH JOHN F. LOOSBROCK, MANAGING EDITOR, AIR FORCE MAGAZINE

Our attention has been called to a typographical error in last month's "Breeze." We misspelled the surname of Cmdr. Bill Fey, who resigned from the Navy to go to work for Sikorsky. No matter how we put it in the typewriter, it came out Fay. We knew he was a fey character from way back, so we have no excuse—only an apology.

☆

As this issue of AIR FORCE Magazine went to press, the hottest news along the Potomac was what Hanson Baldwin, military editor of the *New York Times*, called "a new kind of Iron Curtain, Pentagon style." The Pentagon press corps was up in arms over a Department of Defense directive on the clearance of public information, which the *Washington Post and Times Herald* termed "censorship with a vengeance."

The by-now-notorious directive accompanied a memo to the Secretaries of the Army, Navy, and Air Force, directing them to slice their public information staffs and to supplant their present military information chiefs with civilians.

Actually, the problem was not one of censorship but of slowing down information by requiring everything to be cleared on a Department of Defense level, not only as to security but as to whether or not the material "would constitute a constructive contribution to the primary mission of the Department of Defense." It was the "constructive contribution" clause that had the correspondents boiling.

A cooler look would have shown that information originating in the Pentagon always has been cleared on grounds of policy as well as security. The directive imposed no new censorship. It only made the old version more unwieldy, by requiring decisions to be made by Defense that the individual services had previously been able to handle. The news-gathering job was made tougher but not insurmountable.

In a press conference called to "clarify" the directive, Secretary Wilson denied any intent to stop the flow of legitimate information. This was probably true. The directive was not vicious in intent, merely very badly written.

Much more significant, in the view of this department, is the fact that new, and unofficial ground rules for security clearance have been made in the middle of the game. This is true to a point where what would have been cleared last month would not be cleared for release today. The old yardstick, "Does this material violate security?," has been cast aside. Its substitute—"Would this *appear* to violate security if a governmental bigwig should read it or if it should be called to his attention?"

"I sure hope you were watching the gauges, Russ . . . I think we just set a new record!"

Under great pressure from our readers, last month we inaugurated a "cheesecake department" in this space. To remain honest, we have promised ourselves to limit our coverage of this by-its-very-nature uncovered field to items having a direct relation to airpower. Here is our current offering, gleaned from a release which says that the girl "demonstrates the strength of a 'sandwich' constructed, or laminated, spar which has been bonded with 'CHT,' the company's newly developed modified phenolic adhesive. This type of construction gives excellent service in high temperature and humidity environments when bonded with 'CHT.' "

This makes security clearance, which used to have hard and fast rules, a matter of second-guessing the reactions of the men at the top.

The now-vacant job of civilian director of information for the Air Force calls for an annual salary of $14,800. Personally, if it paid $104,800 annually, we wouldn't touch it with a ten-foot pole under present conditions.

☆

While preparing the chart which illustrates the NACA story on page 93, we picked at random from our files the photo of an Air Force pilot to typify the various agencies which use NACA data. It wasn't until after the engraving had been made that Associate Editor Lee Klein recognized the anonymous pilot as an old buddy of his, Bob Martin. The pair had gone through copilot training for American Airlines at the same time back in 1953. Lee hasn't seen him since they got their airline wings and Martin went to Chicago for American.

(Continued on page 24)

Precision Turning and Boring

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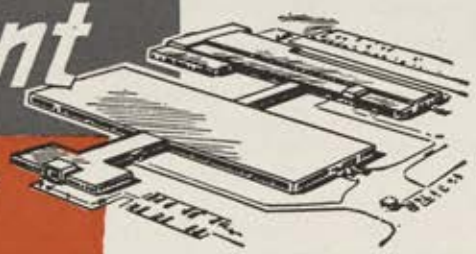

RADAR GUNSIGHT HELPS TAC PILOTS BAG "FOE"

Korean-tested Device Proves Deadly Accurate in Stopping Jet "Invaders"

THE STORY BEHIND THE STORY:

Here at home, where air defenses are constantly being strengthened, there's a good chance of detecting and intercepting hostile planes before they reach their destination. And abroad, as you've probably noticed from headlines like the one above, chances are good that aggressors would be intercepted and shot down by fighters from our overseas bases or from NATO wings.

One reason for the impressive marksmanship demonstrated by Tactical Air Command pilots, of course, is their intensive training. Another is the accuracy of the computing gunsight first used in Korea and now serving TAC and NATO squadrons. Here's what it does, in the words of General "Jimmy" Doolittle:

"In jet combat you are chasing a small and elusive speck, and you have only seconds to shoot at it. You are travelling ten miles per minute, twisting and turning; your senses can't measure the speed and range of the target or the angles involved in hitting it—and even if they could, you lack time for necessary calculations. The new gunsight does this for the pilot. He watches an illuminated circle and dot reflected on his windshield. When circle and dot are superimposed on the target, he fires."

Developed through the joint efforts of the Instrumentation Laboratory of M.I.T. under Director Dr. C. Stark Draper, Sperry, and U.S.A.F.'s Armament Laboratory—the radar gunsight is an example of teamwork at its best – providing better weapons for defense efficiently and economically.

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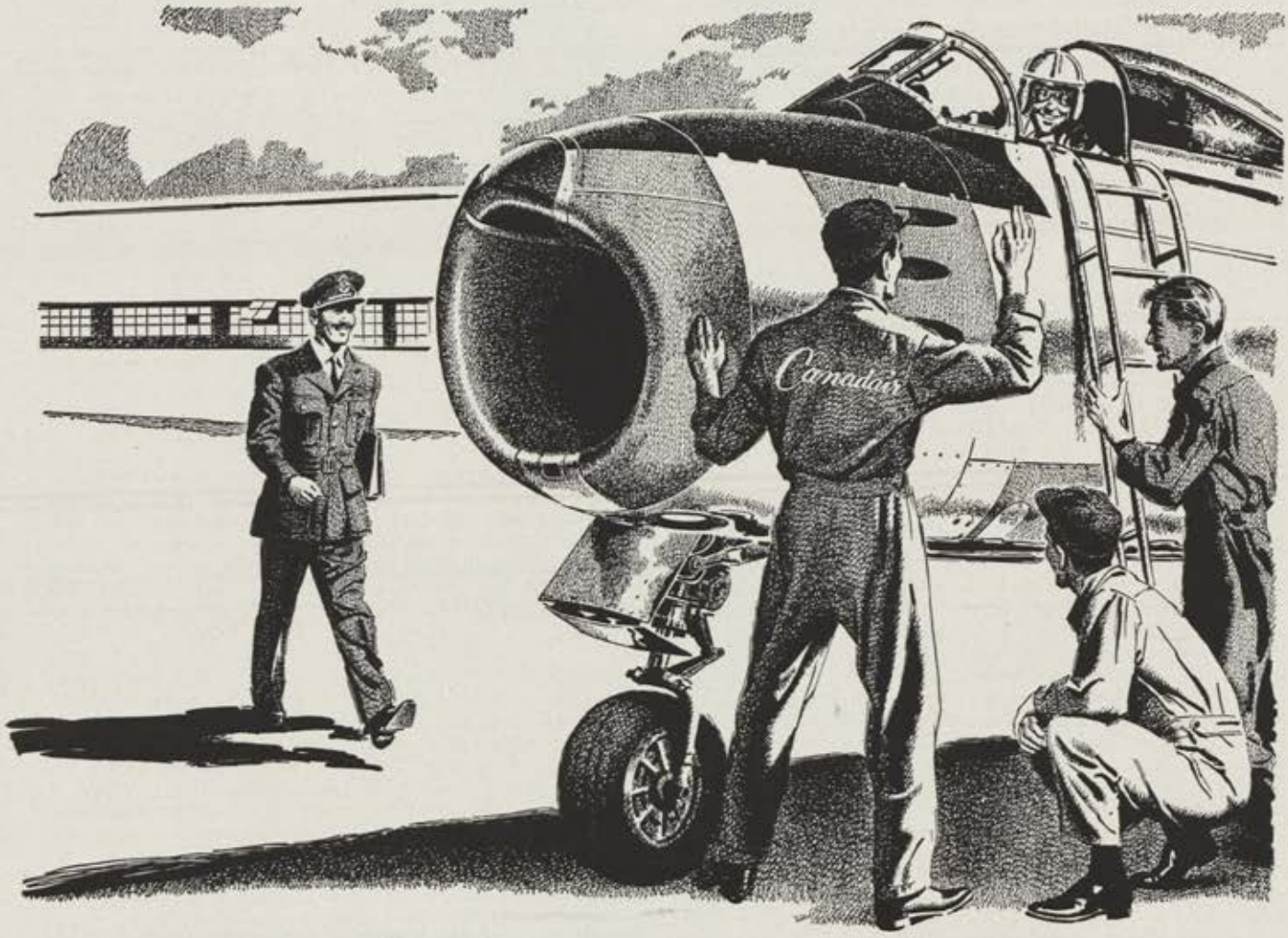

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CASS-9UST

Airpowerwise, the offense still has it all over the defense, in the thinking of Army Gen. Alfred M. Gruenther, Supreme Commander, Allied Powers, Europe. The SHAPE commander points out that "There is no good answer to that plane [the B-47] at this time. . . . The Soviets do not have the answer, and we do not ourselves have one. . . ." Noting that the B-52 is now being added to the USAF inventory, General Gruenther says, "All this means that we have an overwhelming air retaliatory capacity in the event that war should break out today. Thus, to take the most pessimistic assumption, namely, that the Soviets might be successful in overrunning a part or all of Europe now, the Soviets would still be defeated because of our great air capability. Please note that I do not say that we would 'win.' I recognize all too well that if a war should break out now, there would be no such thing as a 'winner.' But definitely the Soviets would be defeated."

☆

One of our subscription renewal invoices came in recently (accompanied by a check) from the 144th Fighter-Bomber Squadron, Alaska Air National Guard, at Anchorage. On it was pencilled this query: "Lt. Otto, should we subscribe for this for operations section?" The favorable response, also pencilled thereon—"OK. Take money from doughnut fund." Proving, as we've said all along, that there are people who would rather read AIR FORCE Magazine than eat.

☆

There's still a lot of civil defense talk going on, with little action. This fact was noted by, among others, Dan Minor on the editorial page of the *Los Angeles Times*. Minor devoted the bulk of two columns to a discussion of Maj. Ken Blank's article on SAC's civil defense program, "Do Your Homework," which appeared in our February issue. Said Minor, "The article is so full of common sense that its lessons are worth recounting—despite a reported apathy among Los Angeles citizens." The Federal Civil Defense Administration liked the article, too, along with Brig. Gen. Dale Smith's piece on the same subject, "Get Out of Town." FCDA reprinted both and distributed them among its people.

More on civil defense—Gov. Christian A. Herter of Massachusetts threw a few problems at the Senate Armed Services Committee on Civil Defense. The Bay State Governor pointed out that their only source for weather information which could predict the area of fall-out from an H-bomb was in Boston and very likely would go up in vapor with the bulk of the city. He wondered about the role of the National Guard ground forces. Would they be federalized and lost to the state for purposes of restoring order after an attack? If so, shouldn't the state have an auxiliary force that the governor could control? He pleaded for more information on which to base lifesaving measures. For example, Governor Herter said, "We have no idea whether or not raincoats are preferable to cloth coats, whether hands or faces should be kept covered, whether or not riding in an automobile with all windows closed provides a degree of protection, and whether or not radioactive particles permeate windows or the walls of buildings, or seep into cellars."

We don't know all the answers to these questions either. But we think we're entitled to. So are Governor Herter and 165,000,000 other Americans.

☆

The Canadians have come up with what appears to be an actual version of the legendary panic button. A press release from Computing Devices of Canada Limited calls the new instrument "Position and Homing Indicator," Using it, a pilot can, by pushing the appropriate button, find out how far he is from one of five pre-selected airfields. The release says the device is being tested by the RCAF, RAF, and USAF.

☆

Management is not the least of the Air Force's many growing pains. One of the things being done about it is the Air Force Manpower Management Training Program, which puts 100 senior AF officers through an intensive three-week course at the George Washington University in Washington, D. C. Not long ago Gus C. Lee, of the Defense Department's Office of Manpower Utilization, told a graduating class about some problems created by military and civilian personnel working side

(Continued on page 27)

FEAF Capt. and Mrs. Cullen Irish donate $25,000 to Japanese orphanages

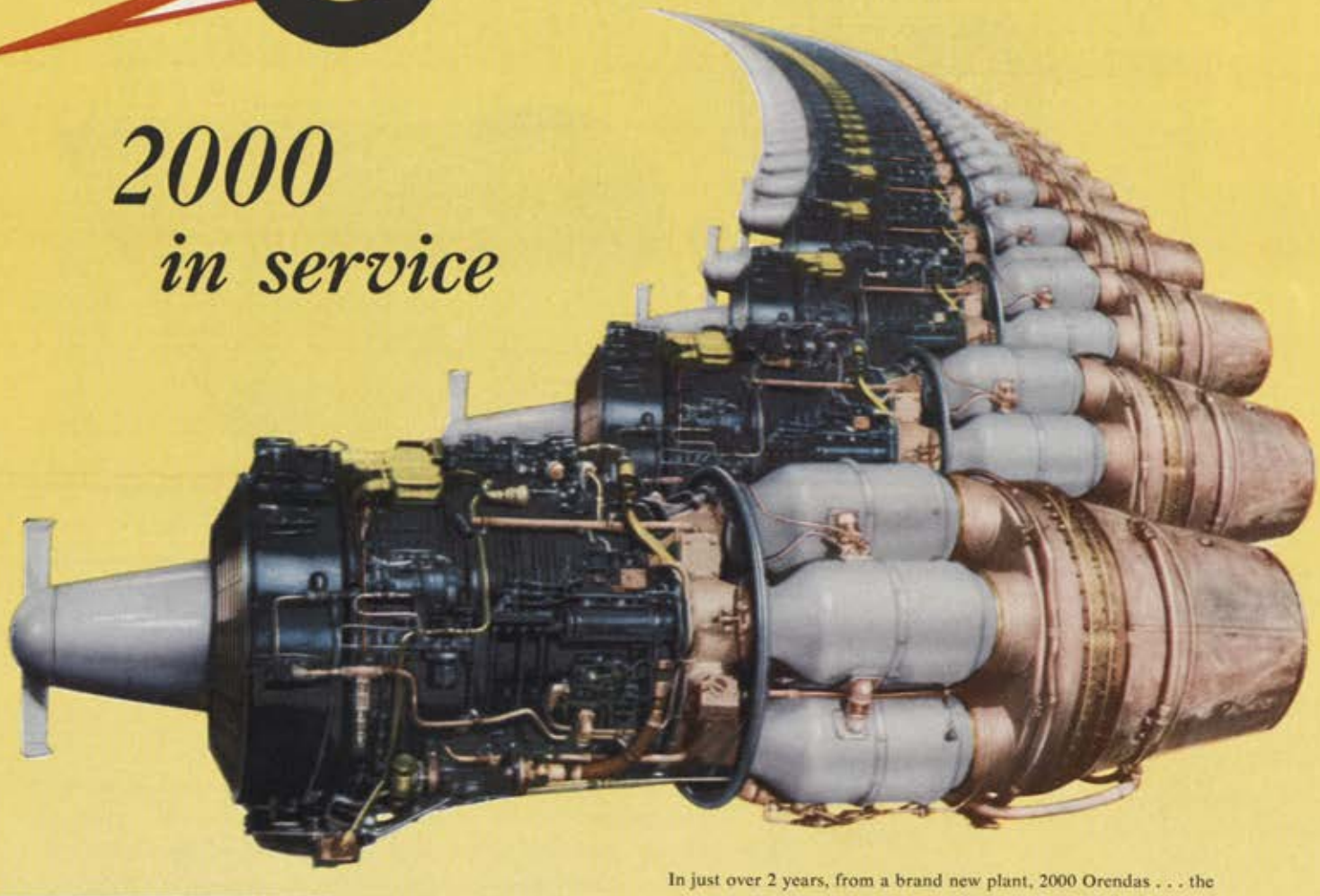
Here's living proof that American airmen do not think solely in terms of death and destruction. Last year Air Force Capt. Cullen Irish and his wife, Desse, won $50,000 in a Stateside contest. They promptly donated $25,000 of it to two Japanese orphanages, with $17,400 going to the Heian orphanage in Kyoto and $4,600 to the Aiseien orphanage in Hirosaki. The other $3,000 the childless couple put into a contingency fund for miscellaneous equipment and future needs of the orphaned youngsters. This spring Captain Irish returned to Japan for a second hitch of duty with FEAF, and promptly looked in on his proteges. He found the money being well spent. At the Kyoto orphanage, Captain Irish got a look at plans for a new administration building, to be called Irish Memorial Hall and slated to be dedicated this month. It replaces a building that was severely damaged by fire last year. A two-story wooden structure with a concrete basement, it will house, in addition to administrative offices, a dining hall, library, kitchen, and recreational facilities for the orphanage's seventy children. At Hirosaki Captain Irish saw his money being used to build an almost-finished dormitory to house fifteen pre-school children. It, too, will be called Irish Hall. At both places he was greeted by swarms of grateful children who demonstrated their affection by staging programs for "Uncle Irish." The captain's reaction—"They did so much for so little. And the kids overwhelmed me."

A Japanese tot gives "Uncle Irish" a gift. Behind her is Miura Masataki, director of the Hirosaki orphanage.

At Hirosaki, the Aiseien orphans swarm around Capt. Cullen Irish (holding child). Behind them is "Irish Hall."

ORENDAS...

2000 in service



In just over 2 years, from a brand new plant, 2000 Orendas . . . the powerplant that makes the CF-100 long range, all-weather interceptor, and the Sabre 5 and 6 fighters, outstanding among front line aircraft. Daily these Orendas prove their leadership at RCAF bases in Canada and Europe.

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Orendas in Canadair built Sabres are providing high performance operations by the RCAF at many bases in Europe.

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Commander
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by side. Salary differential was one—duty hours of the officer are often longer and his standard of living lower than that of the civil service worker in the same office, said Lee. On the other hand, civilian employees gripe about the turnover among the military. An officer may spend six months breaking in, two years producing, and six months as a "short-termer," interested primarily in keeping the boat from rocking. Career development was the third point of conflict mentioned by Lee. Some military men would like to specialize more than they do, looking to skill, knowledge, and ability that they can sell when they leave the service, while civilians complain that putting the military in key managerial positions limits their career development opportunities.

☆

A fact that has been known informally for years finally became official when the Air Force informed the Men's Pajama Institute that "men and women in the services prefer to select their own individual lounging and night items." The statement was included in an Air Force reply to an offer by the Pajama Institute to design GI sleep togs. In a hard blow against pajama gamesmanship, the Air Force pointed out that GI pajamas would represent a "form of regimentation which definitely would not be within the best interests of the Air Force."

☆

A "Boston Herald" editorial poses a vexing question for the long-hairs of the guided missiles era—"Will the missile that can't miss be able to stop the missile that can't miss?" Further light on the subject would be welcomed by the editors.

☆

The new emblem of the Air Research and Development Command (see cut) portrays a missile rolling back the darkness of the unknown. The missile is red and white, the background is dark blue with light blue showing through the tear. Col. A. A. Arnhym, Special Assistant to ARDC Commander, Lt. Gen. Thomas S. Power, won a $100 savings bond for submitting the winning idea.

Exploring the unknown is so dear to ARDC's heart that the command has created the post of Assistant for Innovations in its Analysis and Evaluation office. His name is Lt. Col. M. W. Beardsley, and his job is looking for ideas—from industry, from universities, and even from the man in the street if he happens to have a new missile hidden up his sleeve.

"I'm sorry, General, but until medical research proves it *isn't* a form of altitude intoxication, there's nothing we can do."

New emblem for the Air Research and Development Command.

Ideas should be sent to the Assistant for Innovations, RDTE, Hq., Air Research and Development Command, Box 1395, Baltimore 3, Md.

☆

There is an encouraging trend, if it isn't thwarted by the current clampdown on public information in the Pentagon, toward getting good Air Force reading between the hard covers of books. One of our regular contributors, Brig. Gen. Dale O. Smith, has a new one coming out on May 17. It's a scholarly, yet eminently readable contribution to the literature entitled *US Military Doctrine*, Little, Brown & Co., and Duell, Sloan & Pearce is the publisher, and $3.50 is the tentative price tag. We think highly enough of it to run an article based on material from the book in this issue (see p. 43). . . . Another hunk of fascinating prose is *Beyond Courage*, by Clay Blair, Jr., Pentagon correspondent for *Time* and *Life*. Clay dug into the escape and evasion files of the Korean war (Air Force, September '54), and came up with four tales of incredible heroism and devotion to duty on the part of American airmen downed behind enemy lines. Among them is the story of Col. Al Schinz, who was marooned Crusoe-style on an uninhabited rocky isle off the east coast of Korea. We can't think of a better place to find the answer to the question "What did the Air Force do in Korea?" than in the Blair book. David McKay is publishing it on May 16, price $3.50. The foreword is by Gen. Tooey Spaatz. . . . Joining the ranks of the uniformed writers is another Air Force Magazine author, Lt. Gen. Laurence S. Kuter, Commandant of the Air University. General Kuter attended both the Yalta and Malta conferences as the representative of Gen. Hap Arnold, and his forthcoming book has been tentatively titled *Airmen at Yalta*. Publisher is Little, Brown & Co., and Duell, Sloan & Pearce, price is a tentative $3.00. It probably won't be out till September. . . . Another one coming up isn't strictly Air Force but it certainly qualifies as an airpower book. On May 16, Henry Holt is publishing *The Lonely Sky*, by Bill Bridgeman, Douglas test pilot of D-558 fame, and 1952 AFA Citation of Honor winner. It was done in collaboration with Jacqueline Hazard, who has done a wonderful job of putting the reader right in the cockpit with one of the top test pilots in the business. Price is $3.95. . . . Holt has also done a good job with *The First and the Last*, by Adolf Galland, who headed the German fighter forces during World War II and is reported slated to lead the revived *Luftwaffe*. . . . Volume VI of *The Army Air Forces in World War II* made its appearance last month. Called "Men and Planes," it deals with the activities of the AAF in the Zone of the Interior. The current volume more than measures up to the standards of its predecessors in the series, which earned authors W. F. Craven and J. L. Cate the Air Force Association's Arts and Letters award in 1950. University of Chicago Press publishes the series, price is $8.50. . . . Much credit for the current crop of Air Force books (and more are coming) should go to the Magazine and Book Branch, AF Office of Information Services. Capt. Jim Sunderman is the Branch's book expert. Branch chief is Maj. William J. McGinty, who has helped us over many an editorial hump.—End

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AIR FORCE
MAY 1955

AN EDITORIAL

Armed Forces Day 1955

By John R. Alison

President, Air Force Association

MAY 21 is Armed Forces Day. On that day and during the week that follows it, virtually every community in the United States will pay homage to the men and women who are dedicated to the defense of this nation and its free institutions. One year ago there was a similar outpouring of thousands of words of praise and tribute at hundreds of luncheons and dinners. The temptation to repeat last year's platitudes will be great. But it would be unfortunate indeed should we make Armed Forces Day 1955 merely a reprise of an old and familiar refrain.

For much has happened since May 21, 1954—events which have a direct bearing on the privileges and obligations of the people who wear the uniforms of the Army, Navy, Air Force, and Marine Corps. The hydrogen bomb no longer can be dismissed as only a cloud on the horizon—"a cloud no bigger than a man's hand." Now, we have been told, it is a cloud as big as the state of New Jersey, a cloud laden with radioactive death. The tensions that beset a divided world have not lessened. The military might of the Soviet Union and her satellites continues to grow at an alarming rate.

The man in uniform today bears burdens of responsibility—yes, of personal danger—greater than American Armed Forces personnel have ever before shouldered, short of war itself. His potential burdens, should armed conflict come, are staggering to the imagination.

How has the nation recognized and rewarded its faithful, patient servants in uniform during the past year? There have been steps in the right direction, and I will discuss some of these a little later on. But by and large, the man in uniform still is denied his merited place in a free society—a denial in terms of a prestige commensurate with his burdens and sacrifices, and also a denial in concrete evidence of affection and recognition by the civilian population.

Nowhere is this callousness so reflected as in the matter of one of man's basic needs—a roof for himself and for his family. The Gospel of Matthew tells us that "The foxes have holes, and the birds of the air have nests." I think it not irreverent to point out that, figuratively speaking, both birds and foxes are better off than a large fraction of our military population. During the past year we have eased the situation somewhat by making men in uniform eligible for the same house-purchasing privileges as veterans who have left the service. But the shortage of housing is still appalling and in many cases is actually compromising our military capability.

Another kind of housing shortage exists for many of our operational units. The Air Force alone is being forced to move many of its units

from existing air fields to new bases because of organized community opposition. Communities will fight for a nice "clean" military installation like the Air Force Academy. But in many cases, they refuse to put up with the noise, housing problems, school burdens, and other factors that often plague a town near an operational base.

The fringe benefits, which formerly compensated the man in uniform for the loss of many of his civilian perquisites, show a slight upswing, but our nation still makes it more attractive for a man to get out of the service than to stay in. This situation is in sad contrast to conditions in the Soviet Union, where men fight to get into uniform—and raise their standard of living—rather than struggle to get out of the military. We still rely largely on compulsion to obtain the necessary numbers of men to fill our fighting units. We refuse to provide the necessary inducements that would make a truly voluntary recruiting system work.

I do not wish to paint a picture that is entirely black, however. On the credit side of the ledger, an encouraging number of entries have been made since Armed Forces Day 1954. As far as the individual in uniform is concerned, the most heartening of these is also the most recent. I refer, of course, to the bill providing for a raise in pay and in some fringe benefits, such as flight pay and hazardous-duty pay, for members of the Armed Forces. It was passed by the Congress and signed by President Eisenhower in time to become effective as of April 1. There is no question that any raise in pay is a step in the right direction. But I would like to point out for the record that the military pay structure still is far from what it should be, and that the law is hardheadedly geared to saving the taxpayer money by reducing personnel turnover rather than to recognition of what the military man is actually entitled to.

On the policy side some decisions were taken during the past year which, while not assisting the military man in solving his personal problems, should make it easier for him to accomplish his mission, providing the policies are further clarified and then adhered to.

One of these decisions evokes memories of the 1954 Statement of Policy of the Air Force Association. We said last August that "we do believe, in the interests of both peace and freedoms, that the line of aggression must be drawn and the issue joined."

Our current national policy in the Far East indicates at long last a willingness to draw a line. Without regard to whether the line drawn is the proper one, we believe it is a heartening step in what we consider to be the right direction.

The second policy decision affects every man in uniform and especially those wearing the Air Force blue. Again, I refer to our Statement of Policy, in which we said, "We believe that our national policy must clearly define nuclear weapons as legitimate and conventional instruments for resisting aggression, or the Free World's temporary advantage in weapons technology will continue to be seriously compromised."

President Eisenhower has made that definition, although again it is not as clear as we might desire. At least we have been promised that nuclear weapons will be considered as "legitimate and conventional instruments" in any "major military action." The word "major" still requires a more precise definition, but nevertheless we must regard this policy decision as the key to a more realistic assessment of the role of airpower in modern war.

On the other hand, there are disturbing straws in the current wind which indicate that our military men are in for some rough going when the budget for Fiscal Year 1957 rolls around. This will be an election year budget and subject to all the pressures of the democratic processes. It is pretty well acknowledged that there will be an all-out drive to balance the budget at that time and military expenditures are the only ones that can possibly be cut in significant amounts.

Already, I note an alarming number of articles in our newspapers and magazines which reflect a growing complacency about our own military strength, largely tied to new and relatively untried "miracle weapons." Accompanying this complacency are evidences of a great tendency to downgrade the Soviet military strength. I trust it is not part of a vast plan to soften up the taxpayer and the voter for a substantial cutback in military expenditures next year.

There will be many temptations in the year ahead to put partisanship ahead of statesmanship, the dollar sign ahead of danger, wishful thinking ahead of analytical assessment, and to hold the financial fort at all costs. This has been our history.

As the oft-quoted inscription on an old sentry box in Gibraltar puts it:

"God and the soldier all men adore
In time of trouble and no more;
For when war is over and all things righted,
God is neglected, the soldier slighted."

All things are not "righted" in these uneasy times. But the soldier's lot must be righted—for his own sake and for our survival.

So, while we salute the constructive achievements of the year past, we must continue to press for an even more realistic appraisal of the military situation, with its implications for the man in uniform and for the tasks which he must be prepared to perform on our behalf. This, I believe, should be the theme of Armed Forces Day 1955.—END

IN RUSSIAN

ADD means SAC

Another article on Red airpower by Michael Gladych, whose report on the Reds' new fighters appeared in our March issue. Above, a pair of Russian Badgers, Red counterpart of our B-47

FROM the Kola peninsula in northern Europe to the Bering Straits in the Far East, a growing string of Soviet bomber bases follows the Arctic Circle in a sickle-shaped arc. Poised on their ramps and runways are the planes of the ADD—the Russian counterpart of our SAC. The bulk of that force is still the carbon-copy of the Boeing B-29—the Tu-4. But new long-range jet bombers are already rolling off the assembly lines and in an uncomfortably short period of time Russia could be capable of striking at almost any point within the continental United States.

Until now, our nuclear weapon stockpile and our Air Force have combined to discourage a Red attack, but the public appearance of the Bison —the Russian four-jet intercontinental bomber—brings the situation to a precarious balance. According to latest reports the Bison is on a par with Boeing's B-52. It appears to have both speed and range, and it could well be a hard nut for our fighters to crack.

For well over a year, reports had filtered through the Iron Curtain about a mysterious giant jet bomber. Some claimed it was a six-turboprop, sweptwing aircraft, sometimes called TuG-75. There were even those who suggested the Red bomber reports were just talk. "The Reds are bluffing," they said. "The Germans didn't have a modern global bomber design for the Russians to steal as they did the MIG-15—this talk about a 100-ton jet plane is just so much hot air." But there it was, flying over Red Square on May 1, 1954. A mongrel design, but apparently a good one, and at this writing the Type 37 Bison may even be in limited production.

Credited to one of Russia's top flight designers, Sergei Iliushin, the new sweptwing bomber has been dubbed the "Soviet Comet" after the ill-fated British jetliner. Its four turbojets are buried in the wing like those of the Comet, but here the resemblance ends.

The wing planform of the Bison shows a toned-down version of the British "crescent" principle used in the RAF Victor and Valiant bombers. Briefly, the crescent attempts to combine the good points of the thick, highly swept airfoil with the advan-

(Continued on following page)

tages of the less swept, thin wing. The wing's center section houses four jets and has to be thick. To fill the requirement of a high critical Mach number, the center section has a pronounced sweep—about forty degrees. Its thickness to chord ratio is kept within a comfortable margin by lengthening the chord to make the center section look like a delta.

Out of that solid delta center section sprout thin graceful wings of a high aspect ratio—approximately nine to one. As Boeing has proved, a wing of this kind is a boon to a high-altitude, fast bomber, if the designer can cope with the enemies of high speed—flutter, control reversal, and the boundary layer spanwise drift.

The buried engines mean less drag, but the weight centralized around the wing root leaves the rest of the flexible wing literally flapping. Known as flutter, that flapping motion can be counteracted by distribution of weight along the span, as in a B-47 or B-52—the mass of the engine pods acting as a damper. To dampen the Bison's flutter, Iliushin installed streamlined, anti-flutter balance masses on the wing tips. An unconfirmed report mentions a possible use of these as fuel tanks, but this seems doubtful since the flutter-damping effect would be reduced as fuel is consumed. One thing is sure, the balances act as end plates and reduce the tip stall.

The spanwise drift of the boundary layer is caused by sweepback. The crescent principle reduces that drift in its most ticklish area—the outer part of the wing. The outer wing has five degrees less sweep than the center section. In addition, there is a flow fence in front of each aileron.

The reduced angle of sweep of the outer wing also helps to solve another important problem – dynamic bending. All wings in flight tend to bend upward, especially during tight turns or pull outs. On a straight wing, all that happens is a loss of lift. But sweepback makes the up-bent tip act as a huge elevator flap. You can see what happens now. Automatically, the curved path of the plane becomes more curved, the radius of the pull-out shortens, the G-load increases and our plane is headed for a wing-shedding end.

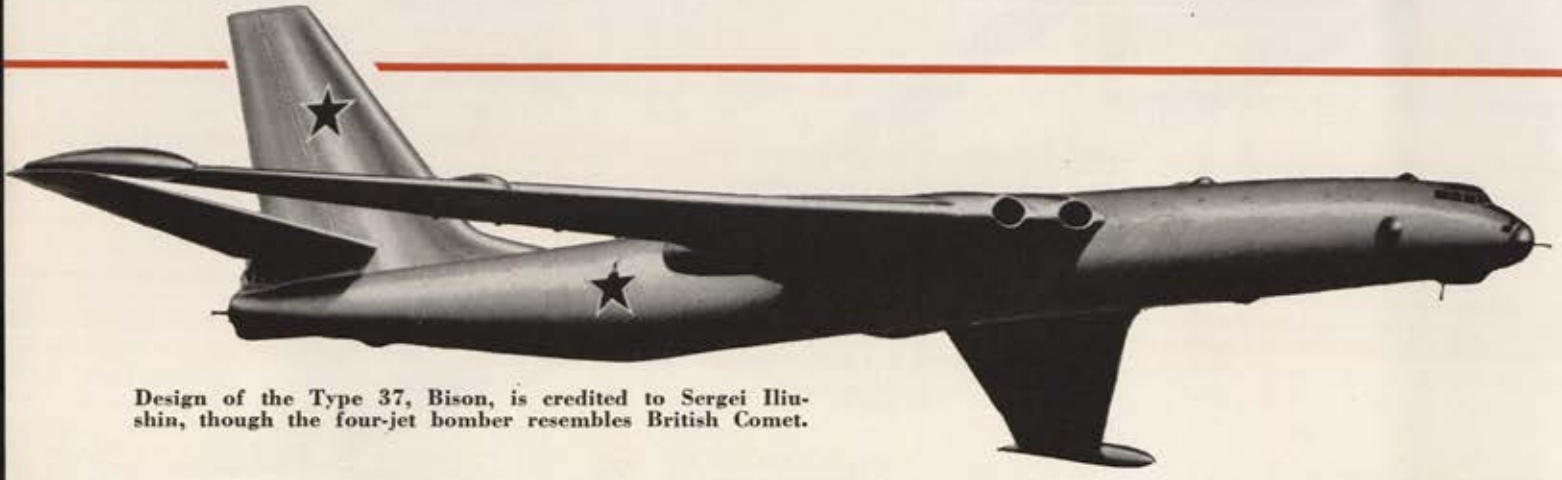
To reach a high critical Mach number, a wing must be either swept-back or razor thin. Evidently, Iliushin decided to compromise. He gave the Bison wing a moderate sweep—not enough to cause the tip washout at high-speed maneuvering. To compensate for the lack of necessary sweep, he made the outer wing thinner.

There is yet another nasty trick that high-speed flow can play on a high-aspect ratio, thin wing. It can reverse the action of the ailerons. You move the yoke or the stick to the right and the plane banks left. This is how it happens. Suppose, the aileron is deflected down. Under normal circumstances, this increases the angle of attack and the lift of that wing tip. The result is the upward motion of the tip and the desired bank. But at very high speed, the deflected aileron makes the wing twist along its spars. The twist will reduce the angle of incidence (and attack) over a large area and the resulting loss of lift on that wing will be higher than the gain due to the aileron deflection. End result—aileron reversal.

Our own B-52 was susceptible to that aileron ailment. The wing could not be stiffened against the twisting so the B-52 now uses spoilers—top wing surface flaps that reduce the lift without the aileron deflection. Iliushin took another tack. The lengthened chord of the center section allowed him to build an anti-torsion spar that runs at a right angle to the fuselage and extends into the wing, thus bracing it against the powerful dynamic twist. So far there have been no adverse reports on the handling characteristics, and on the strength of the limited production order for the Bison, we might assume that the control reversal problem has been licked.

The Bison's fuselage is bulky for its length. The large diameter of the circular cross section might have been dictated by the dimensions of the Russian H-bomb, but more likely it was to accommodate the necessarily large fuel tanks. Some fuel may be carried within the wings, but the bulk of it must be in the fuselage, just aft of the bomb bay.

The Bison is billed as capable of cruising at 630 mph at 55,000 feet. Its four jets of 15,000 lbs. static thrust each are supposed to have the remarkably low specific fuel consumption of .6 of a pound per pound of thrust/hour.



Design of the Type 37, Bison, is credited to Sergei Iliushin, though the four-jet bomber resembles British Comet.

The Bison's crew consists definitely of a pilot, co-pilot, and bombardier, and some observers report also a tail gunner and a radio-navigator who doubles as front gunner. These reports are probably accurate in view of the Soviet Air Force policy of specialized duties. The gunsight blisters and the remotely controlled gun turrets immediately aft of the cockpit show the conservative trend in bomber armament. They may be an indication of inferior speed or perhaps a healthy respect for the gunnery of our fighter pilots.

The over-all clean design is spoiled by the old-fashioned cockpit windows that break the smooth lines of the nose. This may be German influence. German plane designers claimed that vision out of the cockpit was more important than aerodynamic cleanliness.

(Continued on page 51)

FROM a military standpoint, there has been no lessening of Communist pressure during the past year. The military strength of the whole Communist bloc, particularly their strength in the air, has expanded and improved. . . .

Last May the Reds openly paraded numbers of new, medium jet bombers and a new long-range jet bomber in flights over Moscow. We call these new medium bombers Type 39s. They are comparable in size, design, and estimated performance to our own B-47s. Type 39s have been openly displayed in numbers which indicate that they may be in quantity production on this model.

Even more important is their development of the heavy, long-range, jet bomber, called the Type 37. It is comparable in size to our newest long-range bomber, the B-52.

Let me remind you that prior to this year they already had an Air Force of some 20,000 airplanes in combat units. This included thousands of jet fighters and jet light bombers. These earlier jet bombers had enough range to hit most of Western Europe, and all of Alaska, Japan, Formosa, and even the Philippines. They also had well over a thousand TU-4s, similar to our B-29. These could strike even greater distances.

guided missile program. . . . We know they are at work on an intercontinental ballistic missile. We must assume their goal with this weapon is sufficient range to destroy targets in the United States. Ballistic missiles with intercontinental ranges present a defense problem more difficult than any ever faced in history. They will fly at speeds above 10,000 miles an hour. They can be launched from widely dispersed, isolated, well-hidden firing sites. They would be difficult to find and destroy. . . .

I have not attempted to compare numbers of Soviet aircraft or air weapons with our own. . . . There are too many elements of airpower other than sheer quantity that affect such judgment. Here are some examples:

- The degree of modernization of aircraft.
- The weapons they can carry.
- The amount of force that must be devoted to purely defensive missions.
- The base system.
- The quantity and experience of skilled people.
- And the ability to withstand attack and hit back. . . .

This does not mean that we can ignore any disadvantages in sheer numbers that we face. We must recognize any advantage they have in quantity as a gap that we must bridge by our superiority in quality and technology. . . .

A race we can't afford to lose . . .

General Twining Reports on Red Airpower—and Ours

Highlights from the statement of Gen. Nathan F. Twining, USAF Chief of Staff, before the Department of Defense Subcommittee, Senate Committee on Appropriations, April 6

Their new medium bomber—the Type 39—gives them the increased range in a jet plane. With this new model they can reach any important target in Europe, Asia, or North Africa. Altogether these units comprise a potent force.

The addition of the heavy jet bomber—the Type 37—to this already powerful air fleet will give them even longer range striking power and is particularly significant to the United States. . . . This new, heavy jet is aimed squarely in our direction.

In any discussion of Soviet capability in the air, we must assume that they are capable of using air refueling to extend the range of their bombers. Aerial refueling has become a routine operation in our own Air Force and our success with it must be well known to the Communists. . . .

At the same time they are improving their own forces, the Soviets are contributing to the airpower of Red China. This build-up, which includes many jet aircraft, is particularly significant in light of the present tension in the Far East.

However, this growing Chinese air force is not the real danger. A potentially greater danger is their expanding system of air bases. This increased base system gives the Communists the ability to move in aircraft rapidly from the Soviet Union. We cannot ignore their capability to double or triple their air strength in the Far East overnight.

An additional development of significance is the Soviet

During the past year we have continued a series of important studies and tests of tactical atomic power. Our object is to find a hard-hitting, self-protective combination of fighters and light bombers. To this combination we will add aerial tankers and the airlift needed to give this force greater range and greater mobility. We already have units of this type in position overseas. Operational tests will be continued throughout this year. Based on these experiments, we will continue to improve and organize additional tactical atomic forces. . . .

We have improved [our air defense] much in the last year. Our capability to provide early warning is growing daily. We are adding better and faster interceptors with more effective weapons, and our network of interceptor bases is spreading.

Regardless of how effective we are able to make our air defense, it will not prevent the enemy from mounting new attacks. Only our long-range striking forces have the potential ability to prevent the attacker from repeating his air strikes against us. They can do this by destroying the enemy airpower in wholesale lots at its sources.

In . . . 1954, the readiness and effectiveness of the Strategic Air Command to do this job improved greatly. . . . Many units . . . progressed from a training status to a combat-ready status. However, some of SAC's fighter wings went from combat-ready to a training status because they are being equipped with new model airplanes. As

(Continued on page 51)

SEVENTY NINE

The night sky over Northern Canada was suddenly lit with a terrible light, and an awed voice on the radio said, "He's blown!" Thus began one of the most dramatic modern stories of death and survival on the frozen tundra . . .

By Ed Mack Miller

Illustrated by Gil Walker

ON THE blackboard of the predawn Canadian sky, invisible fingers were tracing chalk lines. Southwestward the contrails moved, forming six-line musical staffs from Greenland toward the US border.

The outside air temperature at 30,000 feet this Saturday morning, February 12, 1955, was a minus forty degrees, but in the crawlway of the Boeing B-47 17033, Capt. Thomas L. Pittman was sweating.

He had reason to sweat. For too many hours now he had been wearing a fabric-lined, rubberized exposure suit. Perspiration had been running in rivulets into his rubberized boots.

"Why don't you take that thing off if it's bothering you so much?" one of the crew members had asked him. No, lanky Tom Pittman had told him. His job on this round-robin was to test the suit, and test it he would, even if it melted all six-feet, one-inch of him right down into the boots. But still it seemed too hot to him in the crawlway of that 47. The Alclad shouldn't be that hot to the touch, he thought. Not at this altitude at any rate.

In the nose office of the 47, shut off from the outside world by a Buck Rogers array of radar scopes, navigation instruments, and bombing computers, Maj. Robert D. Dowdy paused in his calculations long enough to note that he was getting hungry. High in the single bubble canopy of the jet bomber, the white-helmeted, oxygen-masked pilot team sat in tandem cockpits. In front, his right palm cradling the six small throttles of the 47, his left hand on the wheel, sat handsome, greying, poker-faced Lt. Col. Kenneth G. McGrew. In the duplicate cockpit behind him was dark-haired Capt. Lester E. Epton, the copilot. Like Dowdy and Pittman, the passenger, their thoughts were of navigation, of the slightly erratic operation of the plane in the past few hours, of small indications of hunger, and of getting home again.

Then it happened.

Capt. John S. Boyd, flying in loose formation with his B-47, saw the bright flash on the inboard engine pod of Colonel McGrew's plane.

"You're on fire, Mac," he said on the radio. Seconds later Captain Epton asked Boyd to check the underside of the right wing. "You've got sparks or flame under the fuselage," Boyd said.

The whole sky lit up then, and an awed voice on the radio said: "He's blown!" Boyd rolled his B-47 over and saw McGrew's plane diving, the fuselage covered with fire from the wing back. He watched the plane till it exploded with a bright flash. After that the B-47 was not visible.

Boyd called Major Bailey, the formation leader, and gave him the details. Bailey asked if there were any parachutes. No one had seen a parachute.

The radar observer on Captain Boyd's plane took a fix and noted the time. The chalk lines continued on toward California, but on radio nets across Canada and the US the word was moving fast.

• • •

Lt. Col. William L. Gibson, commander of the 44th Air Rescue Squadron at Lowry Air Force Base, Denver, had just finished shaving in the upstairs bathroom of his Wherry apartment across from the base when the phone rang. He looked at the clock on the bureau. It was 0715. He took the call on the upstairs extension.

The voice on the other end had a slightly British inflection, but Bill Gibson knew it immediately. It belonged to a Canadian friend of his, Squadron Leader Jack Hudson of the RCAF's 111th Communications and Rescue Squadron in Winnipeg. Only a few months before Gibson and Hudson had worked on a joint RCAF-USAF rescue exercise at a place called The Pas in bleak northern Manitoba.

Jack Hudson had bad news. A B-47 had crashed near the Manitoba-Saskatchewan border, some 310 miles northwest of Winnipeg. Colonel Gibson, a balding, freckled six-footer with the lines of twenty-five years of flying around his sharp blue eyes, assured Hudson the 44th would get there fast. As he placed calls to SAC headquarters in Omaha and the 15th Air Force at March Air Force Base, California, home field of the missing 47, Colonel Gibson considered the fortunes of fate that had prompted him to propose a joint rescue exercise with the Canadians in anticipation of just such a situation as this. Amazingly, the forward base they would have to use would

HOURS

be the same one they had used in the practice missions—The Pas.

It wasn't hard for the 44th to hit the road for Canada. Colonel Gibson merely ordered the same equipment they had used a few months before. Because of the distance it was thought not feasible to take a helicopter. But Capt. John Wilkinson, a Berlin Airlift pilot who had switched to choppers in time for eighty pickup missions in the Korean conflict and had gained quite a reputation as a post-bellum Rocky Mountain helicopter jockey, didn't agree.

"The chopper might be plenty useful up there," he urged the colonel.

"Okay. We'll airship it on a C-119," Colonel Gibson agreed.

"I can get it on the job faster if you'll let me fly it up there."

• • •

At the RCAF Flight Station at Winnipeg, a lissome girl, her long blonde hair done into a pony tail, was climbing into a heavily padded flightsuit. Her grey eyes were calm, but her heart was ticking over quite rapidly. For Nursing Sister (Flight Officer) Marion MacDonald, this might be a great chance to put her expensive training to use. She had made nearly fifty jumps as a para-medic, but only one had been in an actual emergency. This show promised to be no piece of cake. She tucked up her rope of hair under her jump helmet and walked out to the waiting Dakota (Douglas C-47) airplane.

• • •

By 0950 a Grumman SA-16 search plane had already left Denver, and a search party, led by Lt. Col. Ernest Eddy, was getting ready to leave March Air Force Base at Riverside, Calif. At Selfridge AFB in Michigan, the 49th Air Rescue squadron was preparing another SA-16 for the flight north. In cold Canada, the RCAF had already diverted two US Navy planes, a Lockheed Super Constellation and a Neptune, to search near Big Sandy Lake, 120 miles northeast of Prince Albert, Saskatchewan. Two RCAF Dakotas were on their way, and Royal Canadian Mounted Police, flying two dependable deHavilland Otters, were en route. Two deHavilland Beavers, flown by civilians, were also on the way. Things were shaping up. If only there had been parachutes. . . .

• • •

But there appeared to be no survivors. At noon Saturday, Squadron Leader Hudson reported that the wreckage had been located but appeared to be burned out. But at 1400 Central time the hoped-for break came. Hudson advised Colonel Gibson in Denver that the Navy Super Connie had located two parachutes. An RCAF Dakota, orbiting the area, was able to talk to Colonel McGrew on his portable survival radio and to Captain Epton, also on the URC-4 radio.

A Canadian para-medic, Sgt. W. Dawson, was parachuted in to Colonel McGrew, and another survival technician, Cpl. C. P. Cooney, jumped in to aid Captain Epton. Cooney's leg was injured in the jump, however, so

(Continued on following page)

three other para-medics—Nursing Sister MacDonald, Sgt. T. P. McMenamon, and Leading Aircraftsman E. A. Thompson—were parachuted in to set up a survival camp to aid Epton, who was suffering from frostbitten feet; and Cooney, who couldn't walk. It would be too late this night to get them out.

Epton was more than surprised to see the pretty nurse who had dropped like an angel out of the heavens to aid him, and he was even more surprised when she helped pull him nearly five miles the next day on a toboggan to where the Otter had landed to fly him out. McGrew had been flown out earlier and both were flown to The Pas by Otter and then taken to Winnipeg in an RCAF Dakota.

The USAF Mission Commander, Capt. Alexander S. Sherry of the 44th Air Rescue Squadron, arrived early Sunday morning and assumed the duties of assistant search commander under Squadron Leader W. H. Spafford, who had been designated RCAF Search-Master. There was still the business of looking for the other two airmen in the wreckage, photographing the debris for clues to the explosion, and, finally, painting the wreckage with yellow paint so future discoverers of the 47 would know it had already been reported.

• • •

In Deer Lodge Hospital in Winnipeg, McGrew and Epton told of similar experiences: the right wing had blown off and thrown the plane into a violent snap to the right. McGrew thought he had gone through the ejection sequence, but wasn't sure. He had regained consciousness floating down in his parachute. Epton had been sucked from the plane when it had broken in half right behind his seat. Both had been "pretty darned cold" on the ground in their light summer flying suits until help had come.

• • •

Capt. John Wilkinson was chewing on a cold cigar when he landed his Sikorsky H-19 helicopter at the base camp on the unnamed lake at 0945 Central Monday, February 14. The eggbeater crew was quickly briefed and departed for the search area within the hour. When they arrived at the point where the nose section of the B-47 was lying, A/1C George E. Morrison was lowered by hoist from the helicopter. His task was to determine if any bodies were in the nose, which was badly flattened and partially submerged in the frozen muskeg. One body was observed in the navigation compartment. Investigation of the passageway, where Pittman had been, was difficult as it was under water that was covered with a thick layer of ice.

A helmet, which did not belong to the navigator, was found frozen in the ice. The ground party, under very cramped conditions, then managed to chop a small hole in the ice, but were unsuccessful in locating the fourth member of the crew. However, green dye of the type used in survival equipment came to the surface of the hole.

At noon on Tuesday Major Dowdy's body was removed from the wreckage and returned to Winnipeg by Royal Canadian Mounted Police Sergeant A. M. Beaumont and Corporal R. Pollock in an Otter, and the search was intensified for the fourth man, Captain Pittman.

Earlier that morning, Capt. Phillip Warren, navigator on the SA-16 piloted by Lt. E. D. Harris, had sighted a red spot in the woods north of the debris and east of the base camp. But at the time it had been taken for a marker dropped for the helicopter and the search had moved on. On rechecking with Captain Wilkinson, it was decided, however, that the location did not coincide with markers that had been dropped.

Taking Sergeants Cecil D. Gray and William R. Hyatt, Jr., and A/1C Thomas D. Dawson with him, Captain Wilkinson took off again in the H-19, with the SA-16 working above him. The SA-16 then attempted to retrace the path taken earlier that morning.

Lt. Col. Kenneth G. McGrew the Aircraft Cmdr.

Capt. Lester E. Epton the Copilot

Maj. Robert Dowdy the Observer

Capt. Thomas L. Pittman the fourth man

Remembering that he had made a steep turn close to where a section of the B-47 wing lay, Lieutenant Harris was able to find the general area again.

Just as the helicopter began a creeping line search, Lieutenant Harris radioed that the navigator had spotted the patch of color again and this time thought he saw a man waving. The SA-16 dived toward the forest and Captain Wilkinson flew the chopper in close. The helicopter pilot was only about fifty yards away when he saw the man. He noticed that there was blood all around the waving figure.

The trees were about twenty-five to thirty feet tall, and there was no spot in the vicinity that could be used as a

(Continued on page 39)

About the Author

Ed Miller, a new author to AIR FORCE, *knows whereof he writes. He's an Air National Guard type with the rank of captain and flies with the Colorado ANG (his home is in a suburb of Denver). A full-time freelance writer, he's had nearly 200 articles, stories, and features published in some thirty magazines. In addition, he's now president of the Colorado Authors' League and on the Board of Directors of the National Writers' Club. He attended the University of Minnesota and the Colorado Springs Fine Arts Center, and learned to fly in 1941. Since then he's logged more than 6,000 hours as a private pilot, an Air Force pilot, and an airlines pilot (he flew for Braniff International from 1945 through 1949). After that he was associate editor of a chain of weekly newspapers for another four years. Ed, who's thirty-four years old, is married and the father of three little boys and three little girls.*

The world's fastest operational bombers

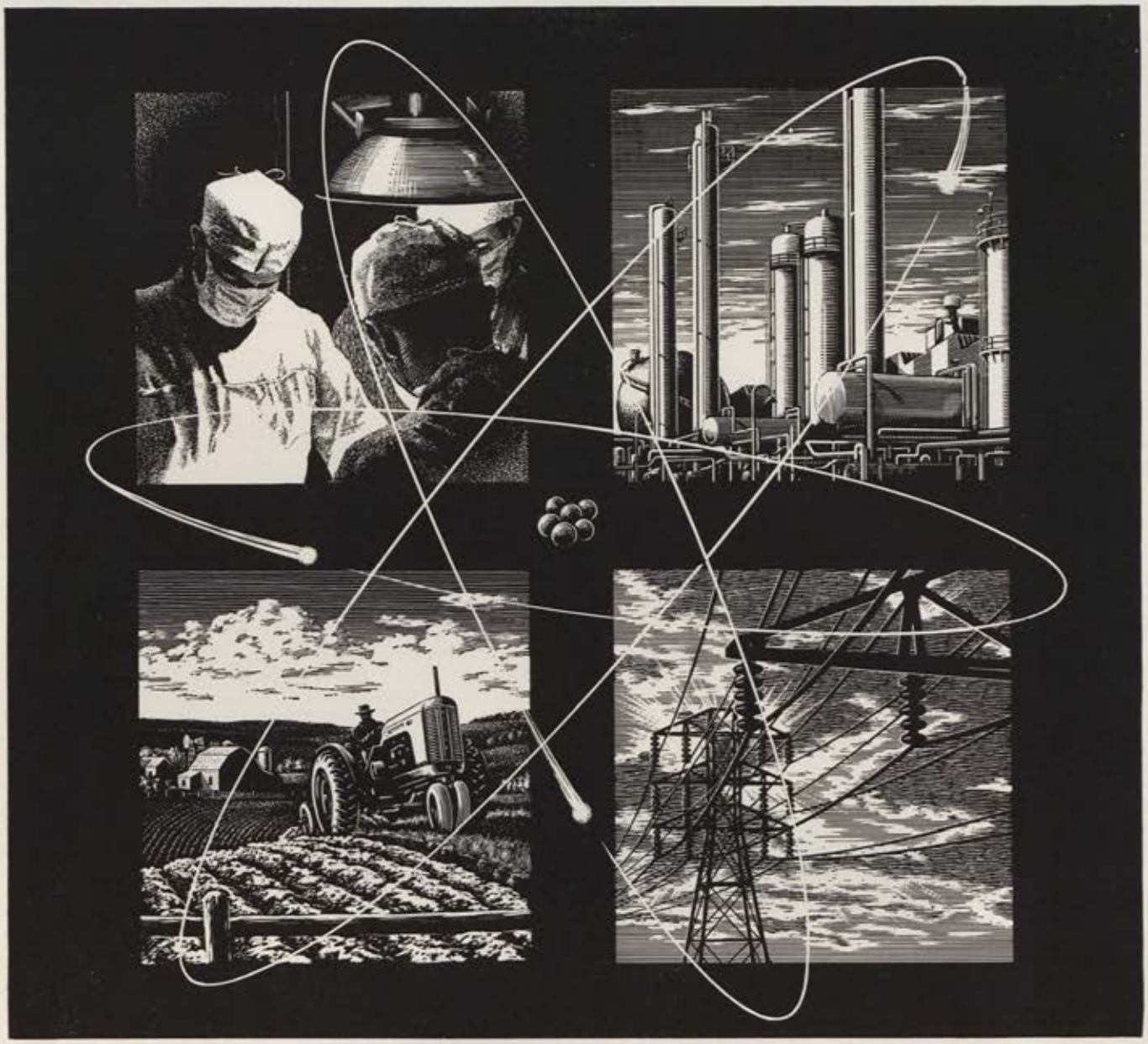
These Boeing B-47 Stratojets were photographed during a nonstop flight from an overseas assignment to their base in the U.S. Such flights, refueled by Boeing KC-97 aerial tankers, typify the global mobility of the Strategic Air Command.

The B-47 is America's front-line, high-altitude nuclear weapons carrier, and the standard medium jet bomber of the U. S. Air Force.

A product of advanced Boeing engineering, the Stratojet has, since its earliest days, set new performance records for jet-age bombers. The latest was a nonstop flight, with aerial refueling, of 47 hours, 35 minutes. During this flight the B-47 covered 21,000 miles, the equivalent of four-fifths the distance around the world.

Since the first production model rolled out in March, 1950, more than 1,000 Stratojets have been produced by Boeing's Wichita Division alone. Output has been as high as one per working day. Experienced manpower, extensive facilities and advanced management techniques enable Boeing to produce the B-47 with fewer man-hours per pound of airframe than were required for the earlier, much less complex B-29 of World War II.

While manufacturing fleets of B-47s, Boeing at the same time developed two other revolutionary airplanes, the great B-52 global jet, now in production in Seattle, and America's first jet transport prototype, the Boeing 707. The Air Force recently announced its decision to standardize on the tanker version of this aircraft—the KC-135—with the placing of substantial orders.



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North American Aviation early saw the need for development and application of the atom to peaceful purposes. Using its own funds, the company set up an organization staffed by leading atomic scientists and engineers. This Nuclear Engineering and Manufacturing organization conducts work for the Atomic Energy Commission and has initiated many new developments in nuclear applications.

This continuing effort has produced several types of research reactors. Two important examples of these, produced for the Atomic Energy Commission, are now in operation. One is being used by the company for advanced developmental study of other reactor designs, and general nuclear research is being done with the other. Other North American designed reactors for industrial and medical research will soon be in operation.

Still another example of North American's advance in this field is the "Sodium Reactor Experiment," a new reactor concept in atomic power. This development is being jointly financed by the Atomic Energy Commission and the company. From this will come many answers to the problem of producing economical electricity from the atom.

ENGINEERING AHEAD FOR A BETTER TOMORROW

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landing pad. Despite the fact that there was no wind, Wilkinson decided to try to come to a hover.

With the 'copter directly above the man, Wilkinson sent Sergeant Gray down the hoist, which was being operated by Sergeant Dawson. Looking straight down with hurried glances, Wilkinson could see Gray helping the man into the cable sling. Then the man was coming up, but Wilkinson couldn't watch because he had his own problems. How to hold the hover? What to do if the weight of three men "upstairs" and two men "downstairs" got the helicopter in trouble? Then Dawson was on intercom telling him the man was in the door. Wilkinson said: "Okay. Get Gray up fast."

Afraid the chopper was going to stall out with all the weight and no wind, Wilkinson started the helicopter moving forward slightly while Gray was still coming up the hoist. Gray later said it was "quite an experience" getting dragged through the tree tops, but he came out without a scratch.

Wilkinson started back to the lake base to spread the good news that Pittman had been found. In the cabin compartment of the H-19 Sergeant Dawson gave Captain Pittman a cigarette. The pickup had been made at 1355 Central time, Tuesday, February 15.

"Well," grinned the lanky captain as the cigarette was lit, "I've got it made." Then he looked down at his bad foot.

• • •

In the hospital at Winnipeg Captain Pittman told his story. He had just finished passing out flight lunches to McGrew, Dowdy, and Epton and was standing in the aisle by the copilot when Epton punched him and yelled for him to fasten up his 'chute. He could hear the conversation on interphone about the engines and he heard Colonel McGrew tell Dowdy, "We're on two engines."

He heard another plane's pilot say that there were white flakes coming off the underside of the wing. Then he heard McGrew tell Epton to drop the gear. At that moment the right wing blew off. Until he was rescued he had thought another plane had hit them.

When the B-47 snapped to the right, Pittman was slammed forward, his crash helmet hitting the autopilot arm and cracking open. At the same moment a flying piece of metal hit his right leg. He saw Dowdy slumped in his seat in the nose compartment and figured the navigator had been knocked unconscious.

Pittman tried to walk to him in the wildly gyrating plane, but his leg, broken in two places, folded under him, and he had to crawl forward. He tried to release Dowdy's safety belt, pull his ripcord, and fire his ejection seat, but was unable to do so, as the nose section was in a sickening, lurching spin. He ripped off his bulky survival kit to have more room to work, but, being thrown around like a ball in a box, he lost his handhold on Dowdy's chair and was catapulted toward the rear of the plane.

The next thing Pittman knew he was going out a hole that had been ripped in the left side of the plane. He pulled his ripcord immediately because he had stayed with the plane a long time and was afraid they were right on deck. He said his only thought had been to eject Dowdy and if he hadn't been thrown from the plane he would have "gone in" with it.

RCAF Nursing Sister Marion MacDonald—like an angel from heaven . . .

Capt. John Wilkinson—Korea taught him a chopper might come in handy . . .

Pittman saw the ground coming up fast and realized he was going to hit the trees, so he folded his arms across his face. The trees broke his fall, and he touched lightly. He sat there in the semi-darkness for three or four minutes trying to gather his senses. Then he realized his right foot was folded along the side of his leg to where he could see the heel of his shoe. It was not paining, but his head was bleeding profusely. He realized that he had lost all of his survival articles except his .38 revolver, a bail-out oxygen bottle, six sulfa pills that his wife had insisted he take with him because of recurring pneumonia attacks, and two matches. His first reaction was to cry, but he talked to himself and assured himself he would make it.

He then took two sticks, which he broke off in the snow, to make splints for his broken leg. He tried to tie the splints on with his shoelaces, but it didn't work so he hauled his chute down from the trees and chewed through two shroud lines, each one taking about an hour to cut. With these he fixed the splint. Then he realized he was bleeding badly, so he made a tourniquet out of parachute nylon, but the bleeding would begin each time he released the pressure.

He estimated that he was four or five hundred miles from the border, and he was sure he would be picked up in a few hours. He became so confident that he fired his revolver twice in the air hoping to attract attention. A short time later he heard a plane. It was flying a rectangular pattern and came directly over him. He became alarmed when he realized it hadn't spotted him, and he tried to find a better spot in the woods to lie, but he couldn't find one. As the day wore on his leg began to pain more and more.

Most of that day (Saturday) he watched the planes circling a spot about two miles from him, and then he realized he would have to spend the night there and his spirits dropped. It began to get very cold. He was getting hungry and thirsty, but was afraid to eat any snow as it was powdery and looked old.

On Sunday he fired at a rabbit, hitting it on the third shot. The rabbit lay only twenty feet from him but

(Continued on following page)

when he tried to recover it he became engulfed in the deep snow, nearly drowning in the underlying muskeg and almost losing consciousness from the pain caused by the attempt. That night he ignited his oxygen bail-out bottle with one of the matches when a plane flew over. It made a good flare but the plane missed it.

The third day, Monday, Pittman spent wrapping and unwrapping the 'chute from around him. When there were no planes he would make a cocoon of it, but when he heard a plane he would spread it out hoping they would see it. The third night was the toughest as his foot was frozen solid now, and he knew that even if they rescued him the leg couldn't be saved. He was losing much blood from it and still had to use the tourniquet. He debated for a long time holding his leg out in the air to let it freeze so he wouldn't lose any more blood, but decided against it. Occasionally he would press his fingernails to see if they turned red in an attempt to find out if he had enough blood left to keep going.

On the fourth morning, Tuesday, he began to get scared when it started to snow. He thought the planes might give up the search. But a short time later he heard two SA-16s and then a helicopter. They seemed to come directly to him and circle overhead. He heard himself yelling and realized he was using up strength he needed, so he kept quiet and just waved to them. Pittman prayed then, and in a few minutes he saw the helicopter coming directly at him.

When Sergeant Gray came down the hoist, Captain Pittman had his revolver in his hand. He threw his arms around Gray's neck, tears of joy streaming down his face. Sergeant Gray asked him what he was going to do with the revolver and Pittman said: "I was going to shoot you if you missed me."

It was understandable. He had been sitting under that tree, tightening and loosening the tourniquet, for seventy-nine hours.

• • •

After evacuation by the H-19 to the base camp, the RCAF Otter to The Pas (flown by Flight Officer Ed McNary), and an RCAF Dakota to Winnipeg, Pittman was placed in Deer Lodge Hospital. The doctors there were amazed at his generally excellent health (they credited the sulfa tablets he had sucked on in the forest with keeping infection down), but attempts to save his foot were unavailing. Characteristically, Pittman said, "I want to lose as little as possible."

Fate had prompted Lt. Col. William L. Gibson, commander of the 44th Air Rescue Squadron, Lowry AFB, to propose a joint rescue exercise for such a situation.

After the operation he was, as always, cheerful. His only complaint was that the amputation itched.

"That guy," said Colonel McGrew, "is the original tiger." Everyone who came in contact with the grinning Pittman agreed.

• • •

B-47 17033 was an airplane of the 19th Bomb Squadron of the Strategic Air Command's crack 22d Bomb Wing. Commanded by Col. Lloyd H. Dalton, the wing won a top place in 1954 in B-47 operational ratings throughout SAC.

Colonel McGrew's crew was one of the best in one of SAC's best wings, as evidenced by the fact that the members of the crew had recently received spot promotions which are given only for proficiency. Major Dowdy had been rated as one of the best atomic bombardiers in the B-47 intercontinental bomb program. It was said that he could drop a stick of bombs within 300 feet of any target any place in the world. A native of San Diego, Calif., he had been shot down in bombers in both World War II and the Korean conflict, but in both cases had ridden the planes down and gotten out safely. Between wars he had been graduated from San Diego State College with an engineering degree. He was given a military burial at Fort Rosecrans National Cemetery, San Diego, Calif. Surviving Major Dowdy are his wife, Aileen, and their daughters, Sandra, two; and Sharon, one.

• • •

At the windup of the search mission, Nursing Sister MacDonald and the other members of the Canadian rescue team prepared to go to Denver where another joint search exercise had long been planned. By now everyone was convinced of the desirability of this type training—especially the Strategic Air Command people, who returned from Canada confident that no matter where their high-flying B-47s cut contrails in the sky, courageous and competent search personnel would be somewhere ready in case of aerial disaster.

Nor could the Yanks quit singing the praises of the Canadians: "These are wonderful people. They just don't come any nicer anywhere," said Lt. Col. Paul Francis, commander of the squadron to which the ill-fated B-47 was attached. He had especial praise for RCAF Air Commodore J. G. Bryans, saying, "He was at the rescue camp at all times, giving personal assistance to the rescue party." Also praised for their part in the rescue, in addition to RCAF and Mounted Police personnel, were civilian pilots Bob Fletcher, John Clark, and Tom Lamb, and Doctor S. L. Carey and Alex Clark, airport manager, The Pas.

• • •

Capt. Thomas L. Pittman is recuperating at his home near Riverside, Calif. Normally cheerful, his main regret is that he was unable to get Bob Dowdy out of that 47. It also hurts that his own career as a B-47 pilot is at an end.

But he knows it could have been worse. If he had succumbed to temptation and taken that hot survival suit off in the plane . . . If his own wife hadn't insisted that he take sulfa tablets with him . . . If a sharp-eyed navigator in a zooming SA-16 hadn't seen a spot of color . . . If a helicopter pilot hadn't been eager to get in the search . . .

Well, seventy-nine hours could be a lifetime.—END

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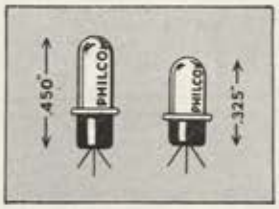

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Quote Carl Vinson, Democrat from Georgia, chairman of the House Committee on Armed Forces: "We have the finest Air Force in the world today. Probably no other single action can assure us of staying out in front than providing NACA with the tools it needs to make the airplane of tomorrow as far ahead as those of our enemy as are our planes today." Or, as Representative Carl T. Durham, Democrat from North Carolina put it, ". . . our air defense today is a projection of the work done by NACA. The fighter plane of today was a NACA experimental design a few years ago; the fighter-interceptor of tomorrow is being experimented on today by NACA. Research is their mission; adequate air defense is their accomplishment."

How does this "light-under-a-bushel" NACA operate? What are some of its accomplishments over the forty years it has been in existence?

Let's start at the top, with the seventeen-man Main Committee. This group is appointed by the President, and is composed of scientists and representatives from the various government agencies vitally concerned with aviation (including Gen. Nathan F. Twining, USAF Chief of Staff and Lt. Gen. Donald L. Putt, USAF Deputy Chief of Staff, Development). It operates in much the fashion of a board of directors of a large corporation. The members serve without pay. They establish policy and plan the research programs to be carried forward by the 7,000 Civil-Service employees who make up the technical and administrative staff of the NACA. (See roster, page 97.)

The Main Committee is assisted in its policy making and its planning by six major and twenty-three subordinate technical committees, with a total membership of more than 400. These men are selected for technical ability, experience, and recognized leadership in a special scientific field. They also serve without pay, in a personal and professional capacity.

Coordination of research is one of the biggest responsibilities of NACA. Through representation on the technical committees, other organizations carrying on research are in position to know what is being done, and the efforts to avoid unnecessary duplication of work have been quite successful.

Much of NACA's work is basic in nature—acquiring the new knowledge about the laws of nature which will enable design and construction of tomorrow's aircraft and missiles.

There is another area in which NACA is working intensively, and that is with problems affecting aircraft already on the drawing boards or in preliminary flight test. Such effort by NACA is at the specific request of the military services.

An example of the basic research is exploration of the problems of aerodynamic heating, at speeds so fast that the resulting temperatures are high enough to melt any known material. An example of the more immediate, or *ad hoc*, type of research is study of stability and control problems of one of the nation's new supersonic jet fighter aircraft.

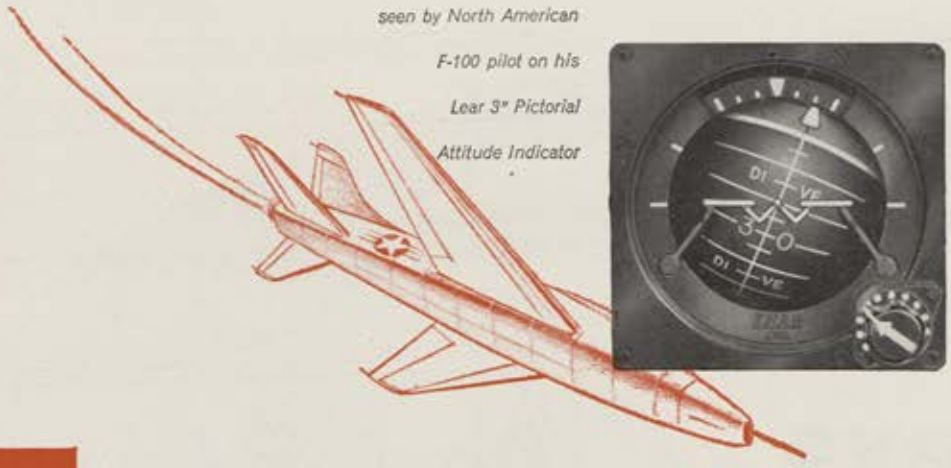
Operating head of NACA is Dr. Hugh L. Dryden. In his middle fifties, Dr. Dryden has spent most of his working life in aeronautical research, although it was not until 1947 that he was called to NACA to become director, succeeding the late Dr. George W. Lewis. Prior to that, he was at the National Bureau of Standards where he had become internationally known for his work on aerodynamic turbulence and boundary layer control.

Sharing administrative responsibilities with Dr. Dryden is NACA's Executive Secretary, Dr. John F. Victory. He

(Continued on following page)

NACA . . . Its Business Is Research . . . Its Product Is Information

This chart shows the result when NACA's basic research is translated into a product—constantly improving airpower. The Ames Laboratory shown above is but one of NACA's five plants. Besides wind tunnels, their facilities include altitude tanks, pilotless flight ranges, and the like, as well. Research memoranda, plus conferences and consultations make the new knowledge NACA gains available to the users — the services, the industry, and schools.



Diving turn as seen by North American F-100 pilot on his Lear 3" Pictorial Attitude Indicator

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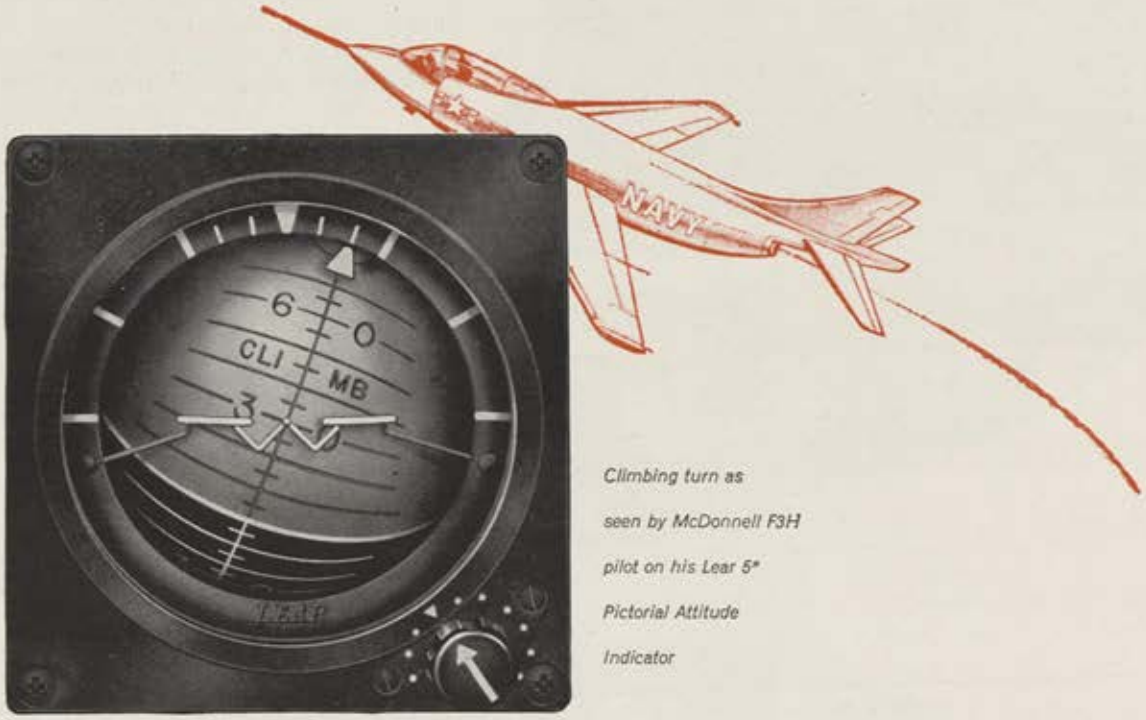
The Lear "two-tone" attitude presentations shown here are a new concept in aircraft instrumentation. As the latest development in the famous Lear line of Vertical Gyro Indicator systems, these Pictorial Indicators have been ordered in quantity by both the USAF and BuAer.



Climbing turn as seen by McDonnell F3H pilot on his Lear 5" Pictorial Attitude Indicator

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NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

NACA's service to the nation in the last forty years, and the story of the men who today seek new knowledge of the laws of nature that will lead to tomorrow's planes and missiles

A Special Report

A FEW weeks ago, Dr. Hugh L. Dryden, director of the National Advisory Committee for Aeronautics, was testifying before the Independent Offices Subcommittee of the Committee on Appropriations of the House of Representatives. NACA's budget for fiscal 1956 was under discussion, and at one point the questions and answers read as follows:

Congressman John Phillips, Republican from California: "I have looked through your justifications and I do not find a single statement of any accomplishment in the last fiscal year which you have made. Have you had any?"

Dr. Dryden: "I would like to discuss that off the record."

Mr. Phillips: "Seriously, the object of your work is to carry on investigations. . . . It seemed to me that in twelve months you might have had some accomplishments. You can discuss that on or off the record."

Congressman Albert Thomas, Democrat from Texas (chairman of the subcommittee): "Do not let him put his light under the bushel. People like to know what is being done."

What Dr. Dryden told the Congressional committee appeared, in the printed report of the hearing, as "discussion off the record." The reason—the great bulk of the research work of NACA, not only last year but ever since the beginning of World War II, has been heavily classified.

During the same session, Lt. Gen. Donald L. Putt, AF Deputy Chief of Staff for Development, told the committee, "The NACA research program is a most vital part of the national research program. It is even more vital, directly, to Navy air and the Air Force."

General Putt gave the Congressmen "a very dramatic example which has occurred within the last several weeks where research has really paid off, and pulled us out of a considerable hole. . . . I point this out to illustrate the very timely and direct application of the work which NACA does to help us." But, again for reasons of military security, the example had to be included in the discussion off the record.

Within the past fortnight, NACA observed its fortieth anniversary in the quiet, modest manner which might be expected from an organization composed of men of science. The seventeen-man group, which is "the Committee," held a regular meeting that was different only in that all past members were invited. In the evening, there was a private dinner, held in the Great Hall of the Smithsonian Institution.

Typical of NACA's research projects is this rocket model. The technician is checking the model's external booster.

Here, Chief Justice Earl Warren of the Supreme Court presented the Langley Gold Medal to Dr. Jerome C. Hunsaker, chairman of NACA since 1941. It was the first time the Langley Medal, one of the most coveted of aeronautical awards, had been presented since 1935. The last time, too, the recipient had been chairman of NACA, Dr. Joseph S. Ames.

The business of this independent federal agency, carried on with a minimum of striving for public notice that is rare among government agencies, is research, and its sole product is information—the new knowledge that can be used in the design of aircraft and missiles capable of out-performing the best of today's crop.

Compared to the multi-billion-dollar cost of constructing and operating America's airpower, the annual expense of NACA is small—$52,000,000 for the current fiscal year. And yet its influence upon aeronautics has been immense. To

(Continued on page 93)

The **194th Squadron at Hayward, Calif.**, and the **167th** at **Charleston, W. Va.**, are the first to be affected. The 194th will move to Fresno and the Hayward location will become the home of the **129th Air Resupply Group.** The 167th will move to Beckley, W. Va., and the Charleston site will house the **130th Air Resupply Group.**

In August, the **148th Fighter Squadron at Reading, Penna.**, will become the **140th Air Transport Group**, and the 148th subsequently will be relocated in Allentown. In November, the **118th at Providence, R. I.**, will be redesignated the **143d Air Resupply Group**, and the 118th number will be moved to Bradley Field, Conn.

For the moment these are the only squadrons programmed for **C-46s and SA-16s.** But it is likely that the **104th Squadron in Baltimore** will be moved out of Maryland and the **135th Air Resupply Group** activated in its place. There is a probability that the **112th Squadron at Akron-Canton Airport in Ohio** also will leave that state and personnel of the squadron will make up the 135th **Air Resupply Group.**

The **119th Squadron in New Jersey** also is having difficulty remaining in the fighter field. The squadron is based at Newark Airport, owned by the **New York Port Authority** which has refused to permit Air Guard jet operations on the field. An effort is being made to re-locate this outfit at **Monmouth County Airport in New Jersey.**

° ° °

Some **58,000 Air Guard officers and airmen,** including more than 3,000 pilots, from eighty-six tactical squadrons and supporting units in the US, Hawaii, and Puerto Rico **will train for fifteen days** in the field this summer.

Brig. Gen. Winston P. Wilson, chief of the **Air Force Division of the National Guard Bureau,** has announced that field training will be on a wing basis for the Guard's twenty-seven tactical wings. Principal training effort will be on **aerial gunnery and intercept tactics.**

The majority of the Guardsmen will train at **seven permanent ANG sites** under the watchful eyes of special advisory teams from Air Defense Command.

The number expected to train this year will exceed by 11,000 the number of officers and airmen who were in the field last summer.

The Guard movement to training sites, General Wilson said, will simulate **regular mobilization operations.** Key personnel and some materiel will be airlifted in ANG aircraft. The bulk of the movement, however, will be entrusted to military convoys and commercial carriers.

° ° °

Reservists from the **8707th "Alamo" Pilot Training Wing,** based at **Brooks AFB, Tex.**, have completed a pioneer training and **good-will flight to Mexico City.**

Brig. Gen. John H. Foster, wing commander, led the flight of nine T-28s, two C-46s, and one B-25. The operation covered more than the monthly training period for the fifty Reservists who took part.

° ° °

Notes on the back of a Form 175 . . . ANG engineer aviation units have been authorized to conduct four outdoor eight-hour drills in lieu of four armory drill periods during the balance of this fiscal year. This will make a total of ten outdoor eight-hour drill periods for the twelve months . . . A number of **ANG appropriations projects,** which apply to field training allotments, have been redesignated. Revised forms which reflect the changes will not be available, however, until next year . . . NGB says that only ten vehicles per augmented tactical squadron or fifteen vehicles per base may be taken to field training sites. The Bureau is arranging for **pooling military buses** at each permanent training site . . . NGB has issued an information guide covering **benefits for Guardsmen** who are **injured at air base drills** or in field training. The guide, in the form of a chart, is contained in a recent Bureau bulletin . . . **Three officers** in the grade of captain or major with AFSCs of 7316, 7324, or 7024 **and three airmen** in the grade of staff sergeant or above with AFSCs of 73270 or 70270 are **needed for a ninety-day tour** of active duty. They will be assigned as two-man teams to Lackland AFB, Tex., Sampson AFB, N. Y., and Parks AFB, Calif., to **coordinate training** of ANG basic airmen.—END

NIKE: PROOF POSITIVE

Nike, a tactical air-defense weapon that is rapidly being installed by the U.S. Army in and around our most strategic defense areas, has demonstrated the reliability and producibility of rocket power.

Under subcontract to the Douglas Aircraft Company, which is associated with the Western Electric Company, prime contractor on NIKE, Aerojet-General developed the sustainer rocket motor for NIKE and is producing them for Douglas in large quantities.

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RESERVE AND AIR GUARD NEWS

The **National Guard Bureau** has issued instructions to ANG wings for the second annual, **Earl T. Ricks Memorial Trophy** event, sponsored by the **Air Force Association.**

The event, a cross-country speed run, will be held **July 21** in conjunction with the **International Aviation Exposition in Detroit.**

Each of the Guard's twenty-three jet-equipped wings has been asked to nominate **one representative.** The pilot selected must hold **a valid green card,** have 500 total jet hours and 100 hours in the type of aircraft he will fly. Those units equipped with F-89s and F-94s also must be represented by an observer.

The competition will start from the Los Angeles area and efforts are being made to acquire L. A. International as the starting point. The event will be timed officially by the **National Aeronautics Association.**

Last year's inaugural event was won by **Lt. Charles J. Young of New Jersey's 141st Squadron,** who flew from Ontario, Calif., International Airport to Detroit in **three hours, twenty-seven minutes, and thirteen seconds.** Air Force Association undertook sponsorship of the event to honor the memory of the late **Maj. Gen. Earl T. Ricks,** a veteran flyer and former chief of the Air Force Division of the National Guard Bureau.

The method of selecting the winner will differ this year from 1954 when elapsed time was the yardstick. The Bureau has worked out a **handicap system** and the winner will be the pilot who gets the **best performance** from his airplane.

Each participating wing will be authorized **a support team** at the take-off point, consisting of one T-33 airplane, one pilot, and one crew chief. The wings must make their own **refueling arrangements** as they did last year. External tanks may be carried but they cannot de dropped while in the air.

Participants will be required to arrive at the starting point on **June 31.** The Ricks Trophy will be presented to the winner at the Air Force Association's **annual Convention,** scheduled this year **August 10-14 in San Francisco.**

Maj. Gen. Leonard E. Thomas, right, of San Marino, Calif., receives the Armed Forces Reserve Medal, in recognition of his thirty-six years of active and Reserve duty, from Maj. Gen. William E. Hall, Assistant Chief of Staff for Reserve Forces. General Thomas holds a Reserve assignment as the Assistant Chief of Staff for Reserve Forces.

* * *

Paid **participation in the Reserve program** is on the upswing. January brought **a boost of 2,347 officers and airmen,** followed by an increase of 3,017 in February. More than 1,000 airmen are included in the February figure.

The rise in the paid participation curve has been constant **since last July.** In the six-month period between July 1 and December 31, 1954, paid participation **increased by 16,000.** In similar vein, the number of aircraft in Reserve flying units increased by 141 to 625. Of the total on hand at the end of last year, 279 were jet aircraft of various types and models.

Col. Harvey L. Case, left, senior air advisor for the ANG in Texas, and Maj. R. K. O'Hara of the Fourth Air Force, discuss administrative procedures during a Federal inspection of the Houston, Tex., 111th Fighter Wing.

The **build-up** of the Air Force Reserve will continue at an accelerated pace **over the next three fiscal years.** A recent report issued by **Maj. Gen. William E. Hall, Assistant Chief of Staff for Reserve Forces,** reveals that some $157 million will be spent for construction at flying installations and about $65 million for construction of non-flying installations. Approximately $27.5 million is being spent in the current fiscal year for **construction of facilities** in fourteen states.

* * *

The Air Force is offering approximately **200 regular commissions** to this year's distinguished **Air ROTC graduates.**

Distinguished graduates who will receive their degrees anytime after this month are eligible to apply for the spaces. Applications must be **filed in duplicate on AF Form 17** to the appropriate PAS&T. Applications must be accompanied by a transcript of credits and must be made **before May 31.** PAS&Ts have until June 30 to forward the applications to USAF along with a letter certifying that the applicant is a distinguished graduate.

Those selected will be **notified about August 1.** USAF reports that priority in awarding the commissions will go to graduates who have applied for—and are qualified for—**pilot training** and who have degrees in engineering, basic sciences, or management and related fields.

* * *

Col. Harry D. Copland, commandant of the **2691st Air Reserve Center in Charlotte, N. C.,** since May 1954, has been named **Assistant for Reserve Affairs to Maj. Gen. George G. Finch,** commander of **Fourteenth Air Force.**

Colonel Copland, who has been flying since 1911, served in both World Wars and was acting commander of the **94th Reserve Light Bomb Wing at Dobbins AFB, Ga.,** when recalled for the Korean war in 1951. A widely-known **lecturer and writer,** Colonel Copland served as aviation editor of both the *Hartford Times* and *Boston Transcript.*

A command pilot, Colonel Copland was a member of the 1936 group which organized and developed the airways traffic control system for the **Civil Aeronautics Administration.** His civilian flying career includes tours with the CAA, organizing contract flying schools, and helping establish aviation in the Far East and in South America. His military career has been spent principally in the fields of **training and Reserve affairs.**

A long-time **Air Force Association member,** Colonel Copland also is a member of the **Early Birds, Quiet Birdmen,** and **Institute of Aeronautical Sciences.**

* * *

Four Air Guard fighter squadrons, which cannot be equipped with jets because of **inadequate runways,** are slated for conversion to multi-engine equipment.

(Continued on page 89)

RENDEZVOUS

Where the Gang gets together

434TH BOMB SQDN. REUNION: Tenth annual reunion will be held at the Grand View Lodge, Brainerd, Minn., on June 27, 28, and 29. Write *James G. Thomas, Secretary, Box L, Elizabethtown, N. C.*

325TH CHECKERTAIL CLAN REUNION: During July 29, 30, and 31 of this year, the 325th Fighter Group will hold its thirteenth annual convention at Detroit, Mich. Contact *Mr. E. G. Fraser, 2433 Mortenson Blvd., Berkley, Mich.*

DISABILITY CLAIM: Would like to contact any former crew members who served with me in 20th Troop Carrier Sqdn., 6th Air Force, stationed at Albrook Field, Canal Zone, in 1944-45 to help me establish disability claim. *Former Sgt. Donald H. Baker, P. O. Box 145, Wethersfield 9, Conn.*

WINGS OVER THE PACIFIC: In 1947 a Mr. Stewart Fern published a pictorial book about the 7th Air Force entitled "Wings Over the Pacific." This book (or books) was supposed to have been published in two volumes. I have a copy of Volume I, but did not get a copy of the second volume. Does anyone know if this book is available anywhere now? *Malcolm E. Wiley, Saint George, Me.*

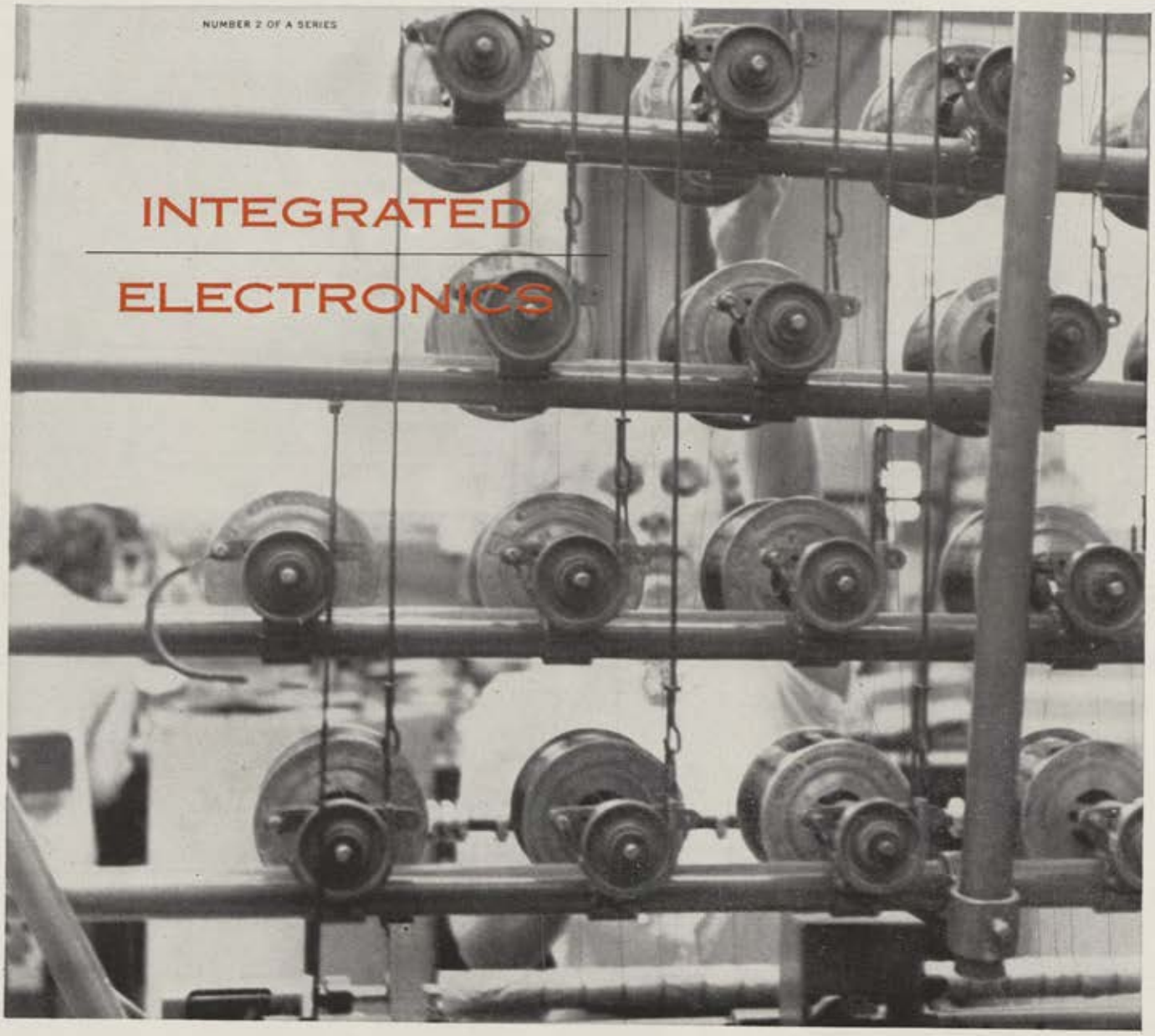
507TH FIGHTER GROUP: Anyone who was in the 507th Fighter Group, including the 463d, 465th, and 464th Squadrons and Headquarters Detachment, in the Philadelphia, Pittsburgh, New York City, and Los Angeles areas please contact *Raymond W. Stoddard, 5 South Ave., Avoca, N. Y.*

OFFICERS' WHEREABOUTS: I am interested in determining the present whereabouts of the following officers, who were stationed at the Ephrata Army Air Base, Ephrata, Wash., in 1944. The rank shown was that held by the officer in 1944: Capt. McChrostie, Capt. Benner, Lt. Docherty, and Lt. Caracino. *Otto J. Klucka, R. D. 1, Vestal, N. Y.*

WHERE'S RAY?: I am trying to locate an old friend known to be with the Air Force stationed in Texas. His name is T/Sgt. Raymond Humphreys—middle initial and serial number unknown. *William B. Duncan, 1135 Japonica Dr., Bainbridge, Ga.*

BACK ISSUES: We need copies of AIR FORCE Magazine for the following months to make up bound copies for office use: 1946—all issues; 1947—Jan., Feb., March, May, June, July, Oct., and Nov.; 1948—March and July; 1949—May. AIR FORCE Magazine, *Attn.: Mr. John F. Loosbrock, Mills Building, Washington 6, D. C.*

NUMBER 2 OF A SERIES



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was recorded at CAP National Headquarters in Washington where more than 100 such missions were recorded during 1954.

In air search alone the Civil Air Patrol wings in the continental limits of the US and Alaska flew 10,671 hours on searches requested by the Air Force's Air Rescue Service. This amounted to fifty-eight percent of the total 18,250 logged by CAP, ARS, and other agencies participating in these searches. On ten of the 110 missions CAP was delegated complete responsibility for the search. Other agencies, in addition to ARS, participated in sixty of the missions.

Information as to which agency located the object of the search was available in seventy-eight of the missions. CAP was the locating agency in seventeen searches, ARS in fifteen of them, and other agencies such as Army, Navy, Coast Guard, private citizens, state and local police, and sheriffs' parties in forty-six missions.

In addition to the actual search missions ARS records show another fifty-nine missions divided into several categories—evacuation, mercy, false, and miscellaneous. Of the fifty-nine missions, sixteen proved false alarms, one was classified as miscellaneous, and forty-two were evacuation-mercy missions. Of the forty-two evacuation missions, CAP was committed to thirty-six of them as the sole agency. CAP logged 424 of the 789 hours on these fifty-nine missions. Agencies other than ARS or CAP participated in only seven and logged 159 hours.

Last year the Civil Air Patrol flew a grand total of 11,095 hours on all types of missions in support of Air Rescue Service. All agencies participating in these missions flew 19,039 hours. CAP flew well over half.

The dog sled team of CAP's Washington Wing is used in mountain rescues.

During a three-year period ending December 31, 1954, official records of Air Rescue Service indicated that CAP's unpaid volunteers flew more than sixty-three percent of all hours on similar missions in the ZI and Alaska.

CAP seniors and cadets train strenuously for air and ground rescue tasks. Above, a team from the Ohio Wing moves a "casualty" in a lightplane "crash."

In a letter to CAP's National Commander, Maj. Gen. Lucas V. Beau, USAF, the Commander of ARS, Brig. Gen. Thomas J. DuBose, said:

"The annual statistical analysis of the Civil Air Patrol's contribution to the efforts of the Air Rescue Service has recently been called to my attention. As always, it is a pleasure to acknowledge and comment on the activities of your splendid organization.

"As you know, I have always considered the CAP the strong right arm of the Air Rescue Service. These new statistics certainly bear out that contention. . . .

"Our reliance on the CAP has increased over the years and, I am sure, will continue to increase in the future. The adaptability of your aircraft for search work and the local knowledge of your pilots are invaluable to the prosecution of our mutual mission."

CAP flight crews are not alone responsible for the organization's enviable record. During the past year CAP's ground rescue crews, many of them ARS-trained, became more numerous and more proficient.

When a Trans World Airlines Martin 404 crashed on top of a 1,000-foot mesa in February, CAP ground rescue crews of the New Mexico Wing were among the first to scale the cliffs. The crew spent a night in sub-zero temperatures guarding the wreckage and then removed five of the sixteen bodies.

Early in January, seventeen-year-old Earl Winkler went mountain climbing in rugged San Antonio Canyon near Azusa, Calif. M/Sgt. Bill Unger, Ground Rescue Officer of the local CAP unit, keeps his team of cadets on twenty-four hour call. When word came in that Winkler lay critically injured at the bottom of a 750-foot precipice, Unger's team got busy.

Taking a basket stretcher, they reached the injured youth after a perilous climb over icy terrain. The cadets administered first aid and provided the patient with hot food, and began the long trek home. Early the next morning they reached the Mt. Baldy Forestry Station from which Winkler was rushed to the nearest hospital. Unger's team was made up entirely of CAP cadets who are students at Citrus High School. Young in years, they are old in mountain rescue experience with the CAP.

In Seldovia, Alaska, the thermometer registered forty-five degrees below zero in March 1954. A tractor plowed its way through high snow drifts, dragging a sled and its passenger, eighty-four-year-old Tom West.

The tractor made its way to the local airstrip, where a CAP L-5 ambulance plane came winging in to take the seriously injured man to medical care. Although it took three hours in the sub-zero cold to start the plane's engine, CAP pilot Bob Mason flew his patient to Anchorage's Providence Hospital.

CAP's Commander General Beau sums up the operational mission of CAP this way:

"I'm an Air Force officer. Courage, heroism, and devotion to duty are no strangers to me, but I have yet to see any group of individuals any more devoted or any more courageous than the volunteer, civilian members of the Civil Air Patrol whose only reward is the personal satisfaction derived from knowing that they are serving their fellow men."—END

Courage and devotion to duty—these are the stock in trade of the Civil Air Patrol, the USAF's civilian adjunct

Volunteers All

By Frank Burnham

Brothers under the skin are the tiny single-engine planes of the CAP (center) and Air Rescue's big SA-16s and H-19s.

ON June 24, 1954, Hurricane Alice unleashed its fury on the Gulf Coast. Two days earlier Thomas Robertson and his sixteen-year-old son, Bill, of Dennison, Tex., and H. S. Watkins of Donna left McAllen for a fishing trip in the nearby Gulf. When Alice struck, almost without warning, the trio was camped on a desolated stretch of beach.

Almost in a matter of minutes they were isolated, their equipment washed away, and their new jeep pickup flooded. The pounding waves cut off their small piece of high beach from the mainland.

The two men and the boy found higher ground on a nearby dune but even then the water was up to their waists during high tide.

Without food and water for nearly two days, alternately immersed in salt water and whipped by high winds, they weakly waved their shirts as first a Navy patrol plane and then a commercial airliner roared overhead. Neither plane saw them.

Meanwhile the McAllen Civil Air Patrol Squadron had been alerted by Mrs. Robertson when her son and husband failed to return home on schedule. Alerted on Thursday night, it was Saturday morning before search planes could take off. As soon as the winds abated Maj. John Cooper, Slim Nagy and Harvey Ferguson got into the air.

In a few hours Ferguson, flying an Air Force L-5 on loan to CAP, spotted the trio. The next problem was getting them out. Vehicles could not approach within miles of the spot. Additional precious hours would be needed to go in by boat. Ferguson elected to try a landing on a tiny strip of rolling beach that was temporarily clear of water.

Using every ounce of skill at his command he brought his plane in. He left food and water for Watkins and took the Robertsons aboard. Luck was with him and the water receded another few feet, just enough to enable him to get his plane into the air.

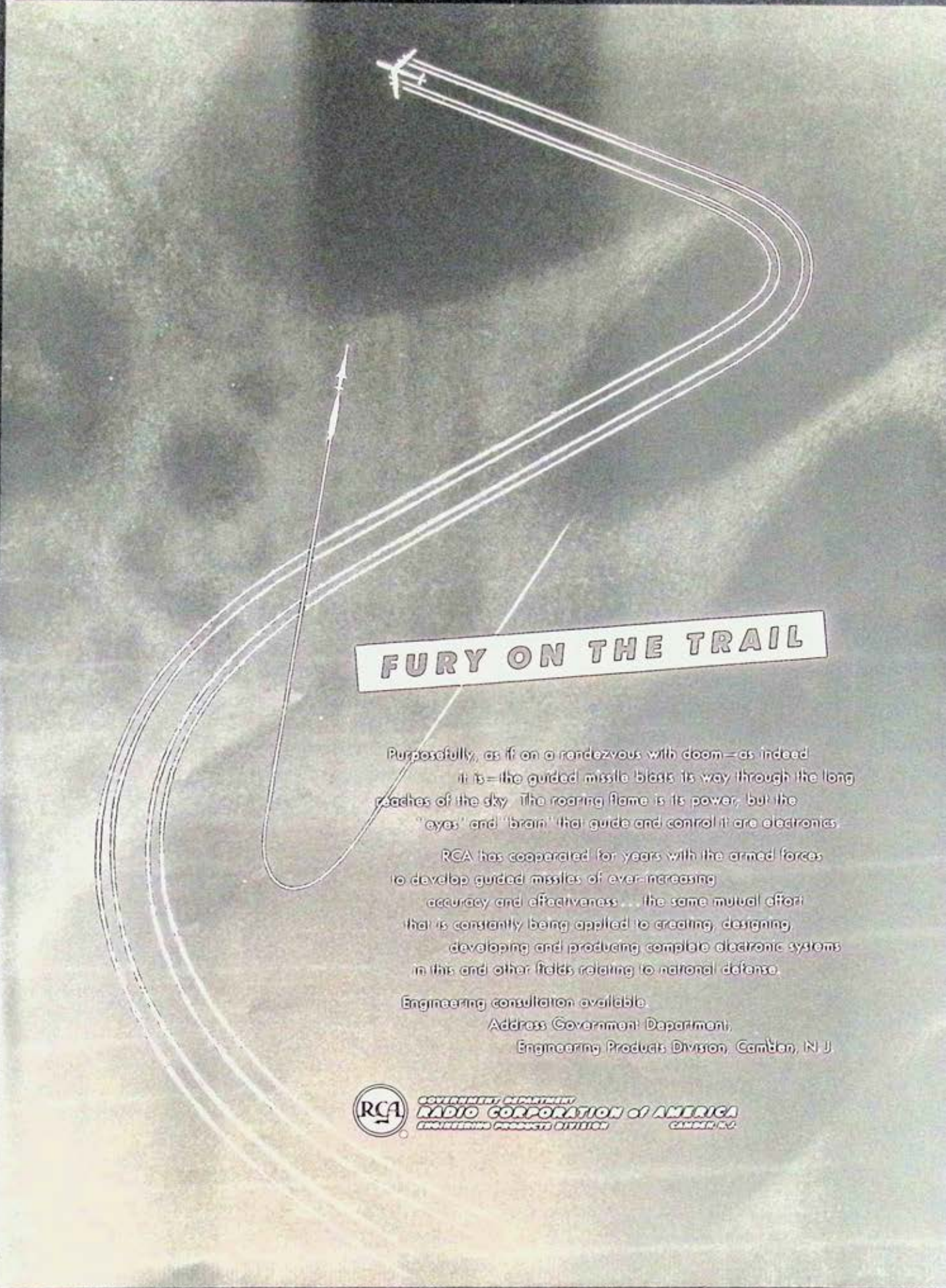
The second trip to pick up Watkins was easier. There was more solid beach available and he chalked up a "mission completed" as he winged over the ill-fated jeep which was covered with water except for one corner of the cab.

"Routine" was the way Ferguson reported the mission on his return to McAllen. "Routine" was the way it

(Continued on following page)

CAP and Air Rescue Service officers plan a search mission. The CAP's low-flying planes are piloted by men with detailed knowledge of local terrain.

Bleary-eyed, CAP communicators stick to it during last year's Iowa floods.


FURY ON THE TRAIL
Purposefully, as if on a rendezvous with doom—as indeed it is—the guided missile blasts its way through the long reaches of the sky. The roaring flame is its power, but the "eyes" and "brain" that guide and control it are electronics.
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Tom Stack
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Here's a view of world-famous Fisherman's Wharf —a spot you won't want to miss while in Frisco.

PROGRAM

Wednesday—August 10

AFA Golf Tournament ..... *Lakeside Olympic Club*
AFA Directors' Meeting ..... *Fairmont Hotel*

Thursday—August 11

Reserve Forces Clinic ..... *Fairmont Hotel*
ARDC-AMC-Industry Forums *Mark Hopkins Hotel*
USAF-Industry Luncheon ..... *Mark Hopkins Hotel*
AFA Commanders' Luncheon ..... *Fairmont Hotel*
Opening AFA Business Session ..... *Fairmont Hotel*
AFA Auxiliary Board Meeting *Mark Hopkins Hotel*
Press-VIP Preview of Airpower Panorama *Civic Auditorium*

Friday—August 12

Airpower Panorama Open to Public *Civic Auditorium*
Annual Airpower Symposium ..... *Fairmont Hotel*
Airpower Symposium Luncheon ..... *Fairmont Hotel*
Ladies Fashion Luncheon ..... *Mark Hopkins Hotel*
AFA Business Session ..... *Fairmont Hotel*
AFA Aux. Business Session ..... *Mark Hopkins Hotel*
Ladies Tour of Fashion Shops *Triangle, San Francisco*
Annual Reunion Cocktail Party ... *Civic Auditorium*
Hollywood Wing Ding ..... *Civic Auditorium*
Annual Airpower Ball ..... *Fairmont Hotel*

Saturday—August 13

Airpower Panorama Open to Public *Civic Auditorium*
Final AFA Business Session ..... *Fairmont Hotel*
Final Aux. Business Session ... *Mark Hopkins Hotel*
Wartime Unit Reunion ..... *Hotels*
Annual Airpower Banquet ... *Sheraton-Palace Hotel*

Sunday—August 14

V-J Day Memorial Day Service *Golden Gate Memorial Cemetery*
Annual Airpower Brunch ..... *Fairmont Hotel*
Installation of AFA National Officers *Fairmont Hotel*

HOTEL RESERVATIONS

Ten San Francisco hotels have set aside rooms for the AFA Convention. Reservations must be made through the AFA HOUSING BUREAU in San Francisco—not AFA in Washington. List first- and second-choice hotels. A $10 deposit is required on each room, and will be credited to your account. Requests for suites at the Fairmont and Mark Hopkins Hotels should be sent to AFA in Washington for approval and forwarding to the AFA Housing Bureau. Reservations will be confirmed upon receipt by the AFA HOUSING BUREAU.

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HOTEL	SINGLE	DOUBLE	TWIN
Fairmont	$10.50-16.00	$13.50-19.00	$13.50-19.00
Mark Hopkins	10.00-14.00	13.00-20.00	13.00-20.00
Huntington			8.00-15.00
Sheraton-Palace	8.00-13.00	10.00-15.00	12.00-17.00
Sir Francis Drake	9.50-13.50	11.50-15.50	13.00-19.50
St. Francis	8.00-18.00	10.00-15.00	13.00-20.00
Chancellor	5.50	7.50	8.50
Plaza	5.00- 7.00	7.00- 8.50	8.00-10.00
Stewart	4.50- 7.00	6.00- 8.00	7.00-12.00
Richelieu	4.50- 6.00		8.00- 9.00
Whitcomb	5.00- 9.00	7.00-12.00	8.00-12.00

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AFA's 1955 Convention

Airpower Panorama

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THE airpower meeting of the year! That's the Air Force Association's 1955 Convention and Airpower Panorama in San Francisco. It will be a combination of conferences, meetings, forums, banquets, exhibits, stage shows, and reunions — all wrapped up in one package — ideally suited for every airpower booster. At no other time or place during the year will every element of airpower be so well represented and offer so much. The date is not far off — make your plans and reservations now. Don't forget to bring your topcoats with you — it gets pretty cool on Nob Hill in August—so the San Francisco Chamber of Commerce informs us.

Once again famous wartime Air Force outfits are making plans to get together during AFA's annual national Convention. The Night Fighter Association has completed its plans for a luncheon-banquet and cocktail party on Saturday, August 13, at the Fairmont Hotel. Gil Nettleton, 1001 East Broadway, Hawthorne, Calif., is handling arrangements for this Reunion. Many other groups are expected to get together during the Convention, including the Air Commandos, Chaplains, and POWs. Groups interested in holding reunions should send details to AFA in Washington for publicity.

Don't miss this opportunity to:

- ★ Renew wartime acquaintances
- ★ Get the latest word on airpower
- ★ See AFA's block-square Airpower Panorama
- ★ Enjoy cool August breezes on Nob Hill
- ★ See beautiful San Francisco
- ★ Meet the leaders in aviation
- ★ See the latest in ladies' fashions
- ★ Participate in timely airpower forums

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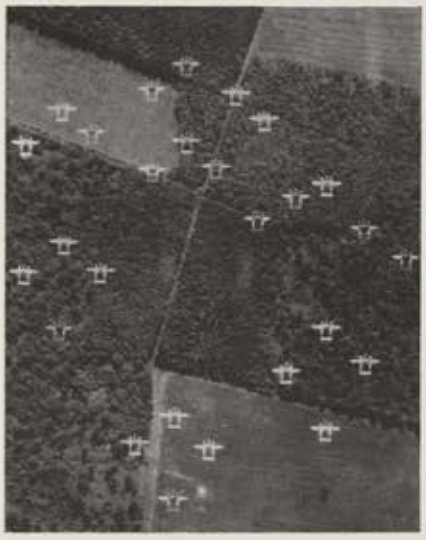
ing to be transported home, men who had been shot down over Paris, over Brunswick, over the flaming refineries of Ploesti, of Bohlen, of Magdeburg. For them the war ended the day American tanks poked their armored noses through the barbed wire that had held them captive. In the hospitals, too, were airmen scarred by flak or frostbite, some still bed patients, some ambulatory in their red GI bathrobes. For them the war had ended the day they were hurt. For them the next great day would be when they went home.

All of which is another way of saying that it's impossible to generalize about the impact of V-E Day upon individuals. It's true, for example, that the pubs and cafes and bistros of Europe were full of uniforms, but so were Notre Dame and St. Peter's and St. Paul's. It's true that the ending of war in Europe left some of the participants curiously unmoved, but to others it was a profoundly emotional experience.

We were sitting in the snack bar of a Red Cross club in London in the small hours of V-E night, drinking coffee by this time. We had been talking about the war in the Pacific and how long it might last. Some said they'd just as soon go on out there and some said they'd rather not and most of us agreed we'd end up there in any case.—END



A mighty pretty sight (the French thought so, too) was this formation of Lockheed P-38 Lightnings over Nazi-occupied France before D-Day.

At right, here's one load of Nazi ammo that never reached the front. A 9th AF Republic P-47 Thunderbolt, outlined by the explosion, has just blown up a German ammunition truck. The P-47 flew through the flaming debris and made it safely back to base.

A 12th AF Martin B-26 catches a direct hit from a flak shell in an attack on Toulon in Southern France. Wing ablaze, the aircraft crashed minutes later.

A flight of P-51s of the 376th Squadron, 361st Fighter Group, forms up for an escort mission to Nazi territory.

Heavy bombers, like this B-24, flew right on the deck to kayo Ploesti.

Below, 9th AF engineers clear German dummy planes from a field in France.

paper hats captioned laconically, "Adolf, you've had it."

Vendors sold flags and tricolored rosettes. Even the dogs wore red-white-and-blue ribbons in their collars.

London was colorful that night. She welcomed, as best she could, the American airmen who had helped bring her the victory. The Red Cross clubs would accept no money for food or drink that night: everything was on the house. AAF men who were lucky enough to be there will never forget it.

But they, after all, were only a handful out of nearly half a million men scattered over Europe, all members of the same AAF team. In the prison camp at Moosburg, Germany, there still were American flyers wait-

(Continued on following page)

D-Day. The wreckage of a Republic P-47 lies on one of the battle-scarred beaches where the Normandy landings were made in June '44.

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Famed for its combat superiority with the United Nations in the skies over Korea, the Sabre Jet is now being supplied to other NATO countries.

Twin Coach Aircraft Division was selected as a subcontractor for large and intricate machinings for the F-86 as well as for North American Aviation's other high-performance aircraft, the F-100 and FJ4.

These important assignments are typical of the way in which leading airframe manufacturers rely on Twin Coach as a source of major airframe assemblies.

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Twin Coach Aircraft Division plants turn out wing spars, main wing panels, flaps, complete center sections with plumbing and electrical wiring, and other large assemblies.

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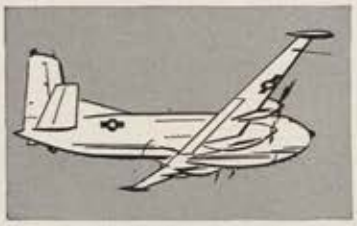
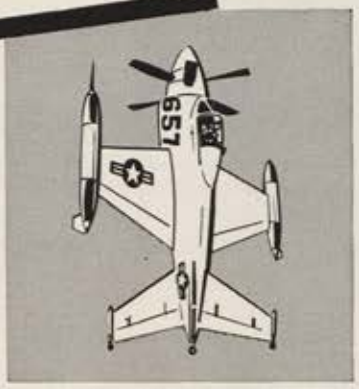


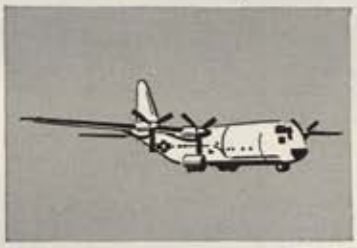
DOUGLAS YC-124B
long-range transport
for the U.S. Air Force

CONVAIR XFY-1
vertical take-off fighter
for the U.S. Navy



LOCKHEED XFV-1
vertical take-off fighter
for the U.S. Navy

BOEING KC-97J
USAF long-range
tanker transport



REPUBLIC XF-84H
USAF experimental Turbo-
prop fighter type aircraft

LOCKHEED YC-130
USAF high-performance
air freighter

BOEING XB-47D
long-range bomber
for the U.S. Air Force

McDONNELL XF-88B
USAF experimental Turbo-
prop fighter type aircraft

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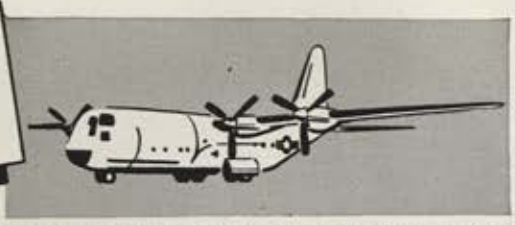

LOCKHEED C-130A USAF high-performance air freighter

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T-38 used in the XF-88B
T-49 used in the XB-47D
T-34 used in the YC-124B, KC-97J
T-56 used in the YC-130, C-130A
T-40 used in the XFV-1, XFY-1, XF-84H

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happy to be a menace, unlike the crowd of the previous day that had watched in angry silence some prisoners munching American rations.

Girls threw their arms around perfect strangers and kissed them on both cheeks. GIs kissed girls, usually on the mouth. Nobody resisted very fiercely. The cafes were jammed, and people did funny little dances in the street.

A correspondent asked a Ninth Air Force captain wearing two DFCs whether he thought so much gaiety was in order when men were still fighting and dying in the Pacific. "Good Lord, yes," said the captain. "If the Pacific war had ended with me trying to strafe some Jerry ammunition train, I'd have wanted those guys to have the best damn party on record. Some of my old gang are out there in the Pacific now. I bet when they're through with today's fighting they'll hoist one or two for me—if they have it to hoist."

In London, the city that had endured the blitz, the buzz bombs, and the rockets, enthusiasm could not wait for the official announcement. By Sunday the city was decked with flags and pennants, the British colors contrasting oddly with the dingy, unpainted windowsills and the skeletons of blitzed houses. It was as if a tired old lady had suddenly decided to put gay ribbons in her hair.

On Monday night the crowds swarmed down Piccadilly, waving flags, and singing everything from "Tipperary" to "Old MacDonald Had a Farm." They climbed lampposts and danced on the roofs of buses. The city was relatively dark that evening, but the next night—Tuesday—floodlights blazed around St Paul's and Buckingham Palace. At the palace a vast crowd waited patiently to hear the King's speech. A couple of restless mallards kept circling the palace, wings whirring, and once a C-47 went lumbering across the sky. When the royal family finally appeared on the scarlet-draped balcony, a roar went up like the sound of surf in a northeaster.

At that same moment the silence must have been deafening in the ruined streets of Kassel and Schweinfurt and Berlin.

From then until dawn the crowds milled through the streets of London. The only solemn people were the MPs, wistfully dignified in all the bedlam. There were flaming torches along St. James, and girls with

(Continued on page 75)

P-51 Mustangs of the 8th Fighter Command swoop low over English buildings as they take off to join the heavies and fly cover for them on a daylight bombing mission over Festung Europa.

Vapor trails point to victory in the air. These B-17s of the 95th Bomb Group are over Brunswick, Germany.

Bombs away, as 15th AF heavies drop a load on an ME-109 fighter plant.

B-17s of the 8th and their fighter escort bore through the sky toward Germany.

around. Not even Americans. We all know we come from a good country, but most of us fail to realize how stupendous our achievements have been. Three years ago, militarily speaking, we had nothing. Today, with our Allies, we have smashed the deadliest menace—and the most powerful military machine—that the world has ever known. There it lies, rotting, in the stench of Dachau and Nordhausen and Buchenwald . . ."

He hesitated, and a second lieutenant who looked about nineteen said, "Go on, Pop."

"There's enough glory in this victory for all the Allies," the major said. "Without the Battle of Britain, and without Stalingrad, we couldn't have brought our power to bear. But without us the British and the Russians could never have pulled the Nazis down. And when you think that in the same short time we've sunk the Jap Navy and put a hundred carriers in Hirohito's front yard, without even seriously dislocating our civilian economy, why, then the power of the United States of America seems fantastic. It's not conceit to recognize the fact. It's our duty and our job to recognize it, and maintain it, and direct it toward the good of the world. For God's sake, let's not go home after we've finished the Japs and decide we can get along without the rest of the world. Even if we could, the rest of the world couldn't get along without us." He stopped suddenly and looked around sheepishly. "Hell," he said, "I'm sorry. I talk too much."

A tall flyer drained his glass thoughtfully. "It makes pretty good sense to me," he said.

That was one reaction, but such self-expression was rare. So were prolonged demonstrations or celebrations among AAF personnel. Generally speaking, the more recently operational an outfit had been—and the closer to the front—the less hilarity there was. Perhaps the men were too tired. Perhaps they had too much to remember. Perhaps they simply felt, as one soldier put it, that it was a good day for the civilians to celebrate.

The civilians did—in most of the capitals of Europe, in Paris and in London particularly. In Paris, just before three o'clock on Tuesday, the crowds began to swarm into the Place de l'Opera. The news had been broken in French newspapers the day before, to the anguish of Allied correspondents still muzzled by SHAEF censorship. In front of the Opera the sun was bright on the flags of many nations. Jeeps crawled through the crowd, literally smothered by people, moving mounds of men in uniform and girls in bright dresses and crazy hats. A truckload of German prisoners, smiling rather arrogantly, was booed by the crowd and the guards waved their guns. But the people were too

(Continued on following page)

A direct flak burst over Yugoslavia chopped this gaping hole and severed the plane's rudder controls, but the 15th AF B-24 Liberator made it back to Italy.

Italy, December, 1944—Maj. Gen. John K. Cannon, center; Brig. Gen. Benjamin M. Chidlaw (in leather jacket); and Army Maj. Gen. L. L. Lemnitzer watch a ground-air demonstration.

Now Chief of Staff, Gen. Nathan F. Twining commanded the 15th AF when this shot was taken in Italy. Here he studies a map at a 90th Photo Recon base.

1944—A B-24 trails smoke as it gets away from a flak barrage over Vienna.

How LEWYT helps the fleet read "invisible messages" with...

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You can't see the "blinker light" flashing its message out there in the dark—but the Signalman with his Lewyt Infra-red Viewer *can*.

When radio silence is ordered, this amazing "invisible light" serves as a vital communications line.

Lewyt has been producing infra-red equipment for the last 15 years, and is ever broadening its development in this field. However, the thousands of Infra-red Viewers made by Lewyt during World War II are primitive compared with those built by Lewyt today. Rapid strides have been made in the past few years.

In 1952 the Navy awarded Lewyt the first of a number of contracts to:

1. **Design and produce an infra-red viewer incorporating an optical system specifically designed for the near infra-red spectrum. Lenses used in earlier viewers had not been corrected or coated for the infra-red wave length**
2. **Engineer a high voltage focusing circuit with completely interchangeable parts to facilitate field servicing.**
3. **Design and develop a 20,000 volt transformer power supply that would operate from the 110 volt AC power source available on shipboard.**

Lewyt engineers met the challenge—*to produce what is probably the most sensitive infra-red viewer thus far made.*

No method existed for production-line inspection of such a viewer. Lewyt engineers had to design special test equipment to insure that all units would meet the highest quality standards for resolution and sensitivity—even under adverse field conditions.

Today the Lewyt-built Infra-red Viewer and Power Supply are in regular production. They will soon be used by the Fleet for detection as well as signalling. In addition, they will be used by the Treasury Department for uncovering forgeries and by the FBI in criminology.

Infra-red is one more field in which Lewyt helps the Armed Forces keep their defenses up. Lewyt employs 1,800 trained workers at all times—busy in peace, ready for emergencies.

Lewyt-built Infra-red Viewer and Power Supply

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SURGE CONTROL—Hagan Pressure Ratio Indicators have been furnished for measuring and controlling pressure ratios for surge control of centrifugal compressors and exhausters. (Bulletin MSP-103A)

MASS FLOW MEASUREMENT—Hagan Mass Flow Meters have been furnished for measuring air flow corrected for absolute pressure and temperature variations, to indicate, record, integrate or control weight flow—or standard cubic feet per minute—or velocity. (Bulletin MSA-112)

THRUST AND TORQUE MEASUREMENT—Hagan ThrusTorqs have been furnished for measuring jet engine and rocket thrust—and cradle dynamometer load. (Bulletin 9345)

All of these systems have been designed with basic Hagan components. A system may use one or a combination of electric, hydraulic or pneumatic operating media to meet the specific requirements of the application. These systems, although designed for special applications, can be and are used in production lines. Hagan units and automatic controls bring new accuracy and flexibility to process control systems.

Hagan Corporation has its own Analog Computer for analyzing complex control circuits. Contract time is solicited for such problems as you may have.

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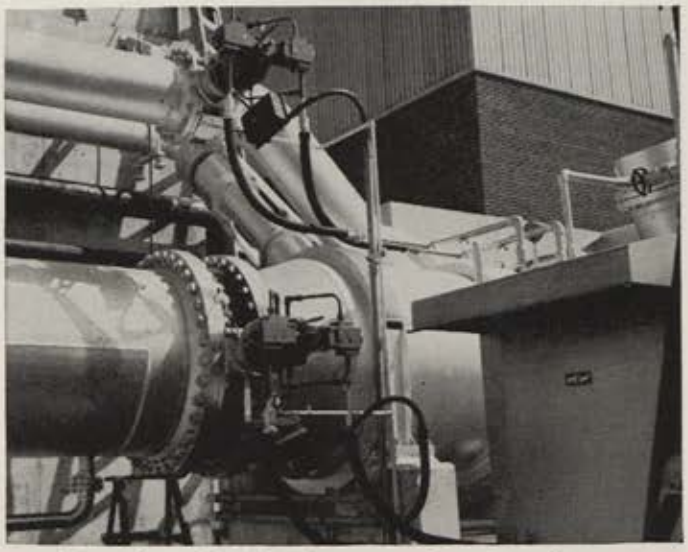
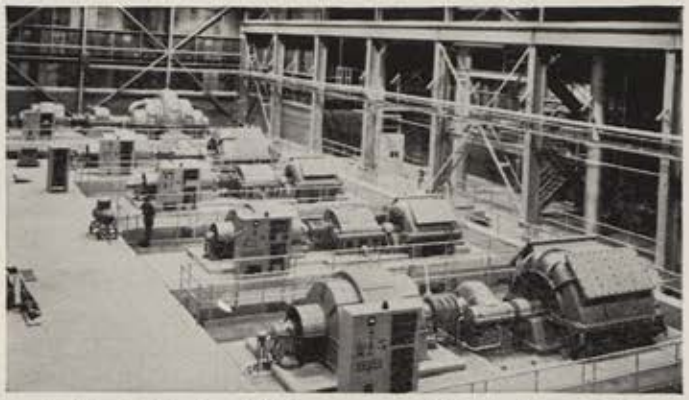
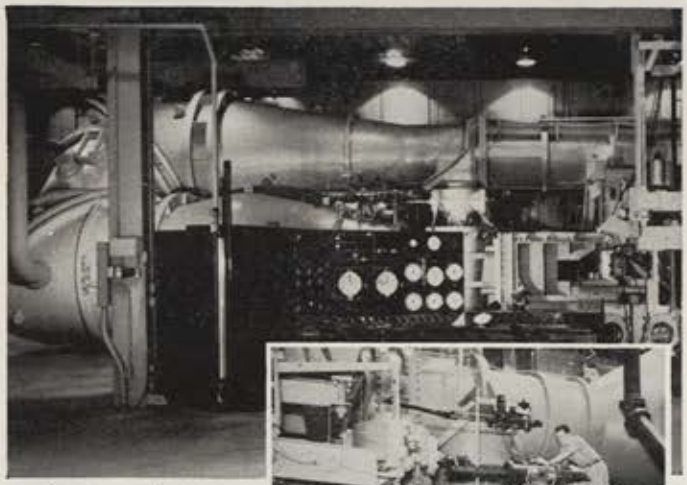


Hagan electro-hydraulic valve operators for engine test facilities



Centrifugal exhausters with Hagan surge control for engine test facility



Hagan control center for wind tunnel

Hagan pneumatic operators for wind tunnel valves

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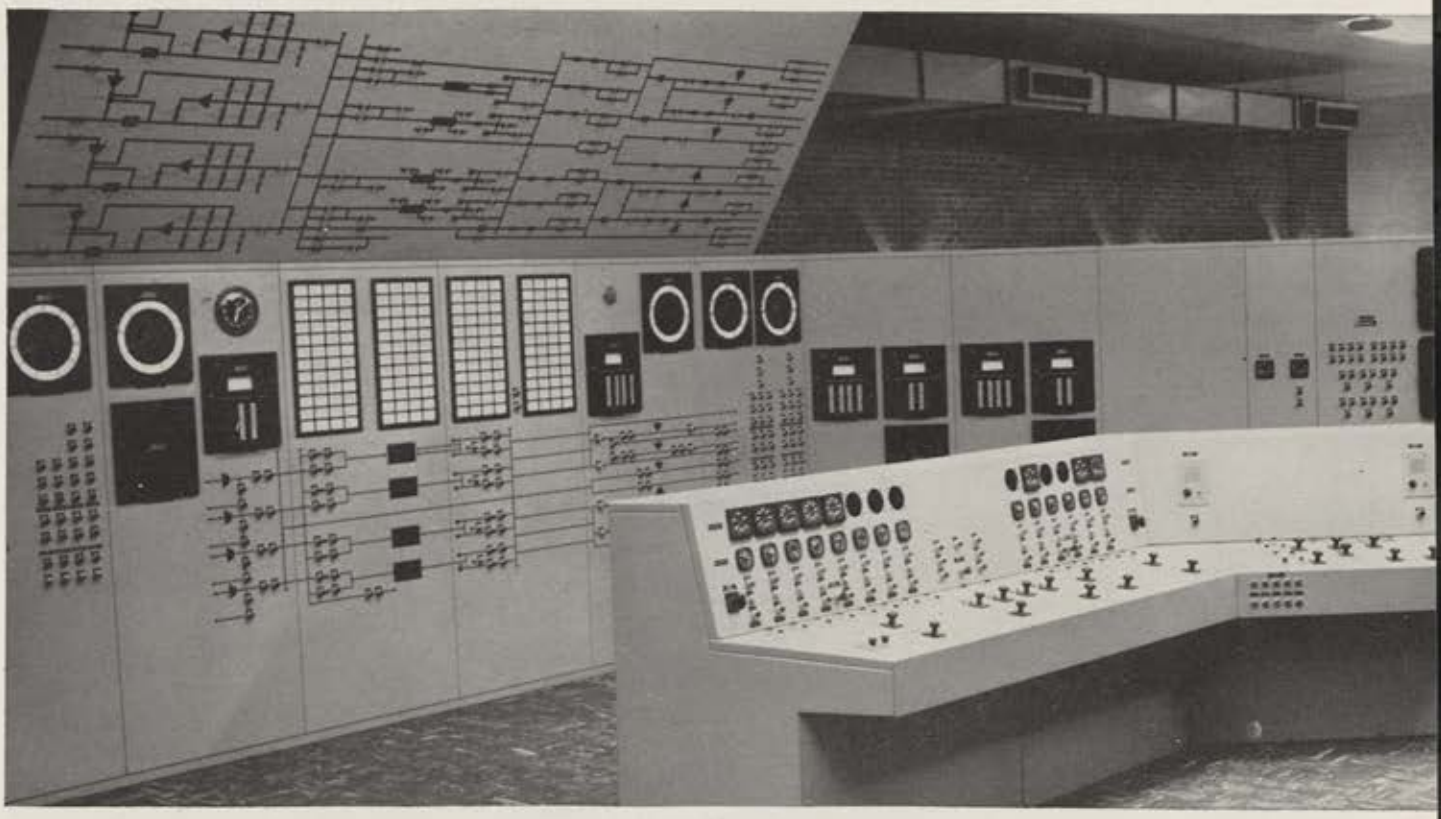
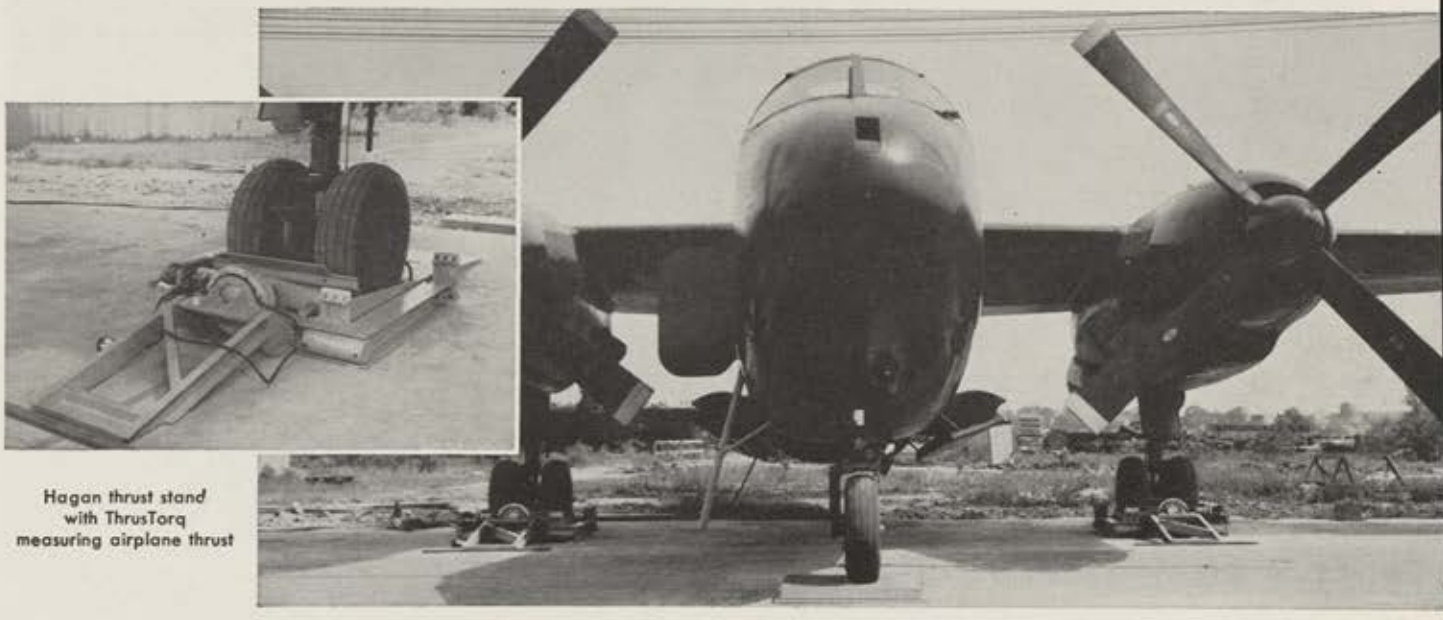


Hagan supervisory control center for engine test facility



Hagan thrust stand with ThrusTorq measuring airplane thrust

on tour...Gilfillan GCA Quadradar

A compact "auditorium on wheels" is now touring military and civil air bases throughout the United States to demonstrate the Gilfillan GCA Quadradar. Inside this streamlined, air-conditioned truck and trailer unit is seating capacity for 12 visitors, as well as the lightweight 4-in-1 Quadradar, a communications system, power unit, motion picture projection equipment and the new Gilfillan radar trainer.

GCA RADAR AND ELECTRONICS

Gilfillan

LOS ANGELES

GCA

AROUND THE WORLD

Nobody seemed to know the answers to such questions. But there was one certainty that overshadowed all the rest. The Germans were finished. On the shattered cities of the Third Reich—the Reich that was to last a thousand years—no more bombs would fall. Our fighters would still sweep the skies over Europe, but the tapes on their gun muzzles would remain unbroken. No flak would rise to meet the bomber boxes. No more airmen would be reported missing in action in this theater. There was much to be thankful for.

Even the Germans were thankful. The terror from the skies that had wrecked their homeland, destroyed their *Luftwaffe*, and—on the testimony of their best field generals—paralyzed their *Wehrmacht*, was ended. In Wuppertal, German women put on their fanciest summer dresses and picked their way through rubble-filled streets. In Munich, they passed without a glance the ruins of the Hofbrauhaus and the repaired cellar where the Nazi movement began. Their faces showed their relief, but if there was any trace of remorse, any consciousness of war guilt, the Allied conquerors could not see it.

Easter services for a 9th AF outfit in North Africa, 1943.

"Bergatroid," mascot of a B-25 squaddron attached to General Doolittle's Strategic Air Force, sweats out a chow line somewhwere in North Africa.

For the AAF men who flew and serviced the Britain- and Italy-based heavies, the urgency had disappeared from the war days before, when Allied armies biting into the shrinking Reich overran virtually all the important strategic targets. Airmen of the Eighth Air Force, their work of destruction complete, had turned to the more satisfying tasks of ferrying food to the starving Dutch or flying their faithful ground crews at low altitude over German targets to see for themselves the results of the air attacks their patient work had made possible.

At some airfields in Great Britain, all personnel were restricted to their bases on V-E Day. This did not mean that there were no celebrations. One group had hoarded 198 barrels of beer for just such a contingency. Stations were manned by skeleton staffs. Finding themselves without a war, the boys at one group fought a mock battle with Very pistols, sending colored flares arching across the late purple twilight.

En route to the target for the day, North American B-25s cast dark shadows on the North African desert.

Italy—the Abbey of Monte Cassino was demolished to drive the Germans out.

Reactions of individuals differed considerably. Some felt a curious letdown, a distinct sense of anticlimax. Others felt a sudden surge of inarticulate pride in their country and its achievement. At the bar of the officers' club at one of the oldest heavy groups in the ETO, the group intelligence officer, a major with iron-gray hair, and service stripes of World War I above this war's bars on his sleeve, tried to find the right words. He said: "I hope none of you guys will ever let anyone disparage the USA while you're

(Continued on page 71)

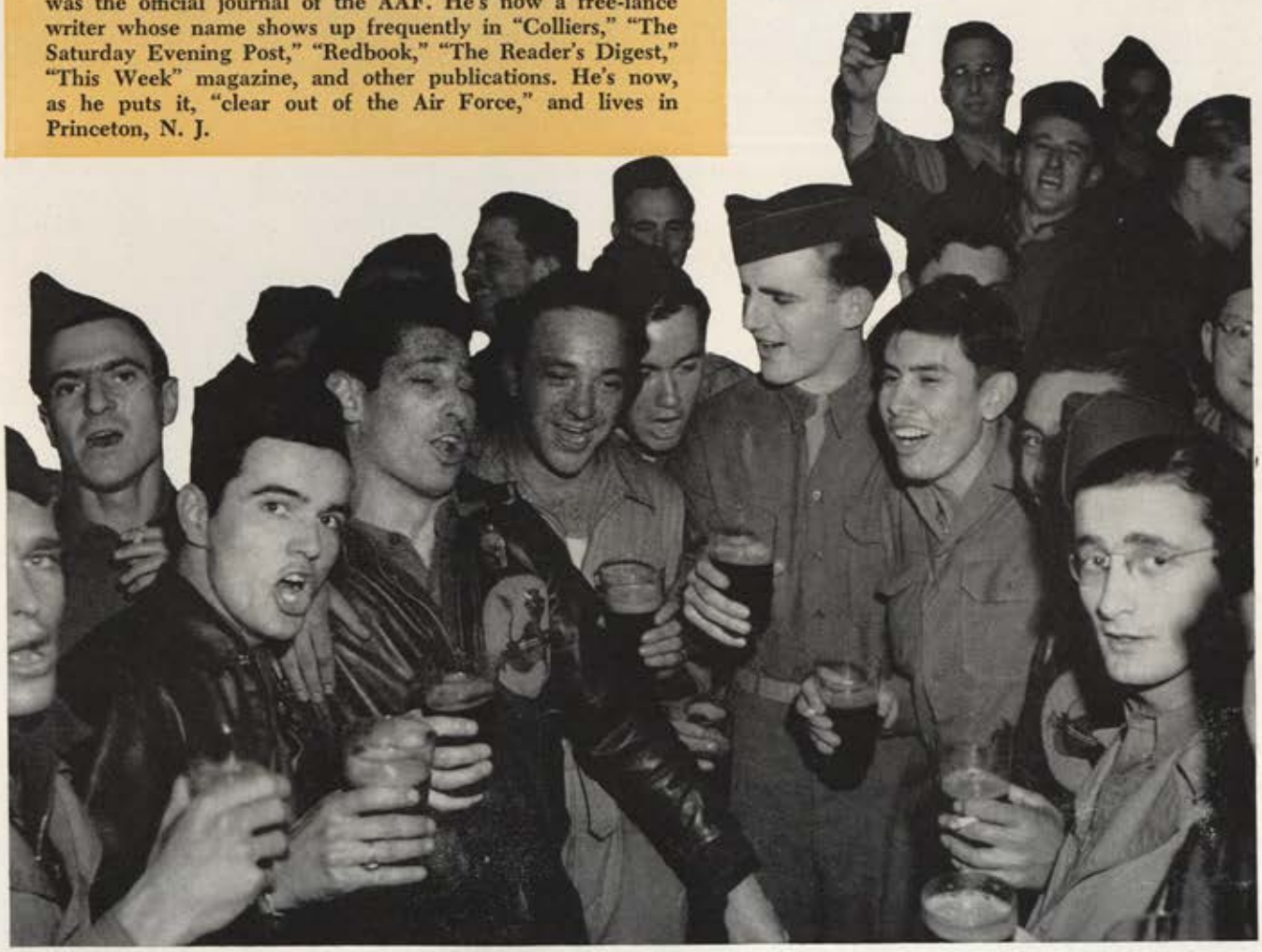
10 YEARS AGO

Victory in Europe

How the men who'd fought the air war over Europe felt when they learned the Germans had quit

● Here's an article, reprinted intact from the June 1945 issue of this magazine, by Arthur Gordon, then a major and one of the staffers in the wartime days when AIR FORCE was the official journal of the AAF. He's now a free-lance writer whose name shows up frequently in "Colliers," "The Saturday Evening Post," "Redbook," "The Reader's Digest," "This Week" magazine, and other publications. He's now, as he puts it, "clear out of the Air Force," and lives in Princeton, N. J.

By Arthur Gordon



V-E Day—May 8, 1945. Here's how one NCO club in England looked as airmen of the veteran Eighth AF whooped it up.

TO AAF men in the European theater, V-E Day seemed to come with maddening slowness. When it came, it simply made official what had been inevitable for weeks. Germany had surrendered unconditionally; the war in Europe was over.

At AAF bases from the wind-swept bleakness of Iceland to the hot glare of the Mediterranean men looked at one another with a queer finality and said in a thousand different phrases and with a thousand different inflections: "Well, it's over. *Fini la guerre.* This part of the job is done, anyway."

Often they said it rather flatly. The edge was off the news. There had been too many rumors, too many conflicting reports, too many false starts. In most minds, moreover, there was still a large question mark about the future. "Now what?" they asked one another. "Most of us will get a crack at the Japs—that's sure. But do we go direct, or do we go home first, and who will be tagged for occupation?"

(Continued on following page)

MATS SERVICE TEST PROGRAM BOOSTS TURBO-PROP POWER

FIRST Turbo-Prop powered aircraft delivered to a U.S.A.F. operating unit are rapidly accumulating time and experience with the Military Air Transport Service. Assigned to the newly established 1700th Test Squadron at Kelly AFB two Convair YC-131C airplanes spend hours in the air over San Antonio, Texas and en route to MATS bases on east and west coasts.

The twin-engined aircraft are powered by Allison YT56 Turbo-Prop engines and Aeroproducts propellers.

With flight records of 10½ hours on one aircraft in a single day, the crack pilots and ground crews of the 1700th are rapidly becoming aviation's most enthusiastic boosters for Turbo-Prop power.

This Air Force flight testing carries forward a Turbo-Prop flight test and evaluation program begun almost five years ago when Allison began flying another Convair passenger-type airplane powered by earlier model T38 engines. This airplane has also been used extensively for demonstration purposes and has made more than 600 flights, carrying approximately 3600 passengers.

To date, Allison Turbo-Prop engines have powered in flight 21 aircraft of 9 different types—all independent of any other power. This is more experience with Turbo-Props than the total for all other U.S. Turbo-Prop engines.

It is superb background for introduction to commercial service of the new Allison Model 501 Turbo-Prop engine. The T56, its military counterpart, will have accumulated two years of production and operating experience prior to commercial availability for regularly scheduled passenger service.

These new Allison Turbo-Props, for both military and commercial use, reflect the knowledge Allison has gained in designing and building gas turbine engines that have flown more than five-and-one-half million hours. These engines are daily flying the equivalent of one hundred trips around the world—*experience where it counts most—in the air.*

ALLISON DIVISION OF GENERAL MOTORS — Indianapolis, Indiana

GM GENERAL MOTORS AIRCRAFT POWER

Allison TURBO-PROP ENGINES

AMERICAN BUILT FOR THE NEW ERA IN AIR TRAVEL

WESTERN GEAR

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a

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The design and manufacture of gears, gear drives and specialized equipment for aircraft use is a major activity at Western Gear. Since the first days of mechanized flight, Western Gear designers and engineers have played an increasingly important part in the production of components for mechanical or automatic operation of aircraft.

Virtually every major military or commercial aircraft today utilizes one or more Western Gear units. We are proud to be known as an important supplier to practically every major aircraft manufacturer. Our staff of engineers and designers are nationally regarded as experts in the field of aircraft mechanical power transmission.

Our plant facilities are unequalled and we are equipped for all types of machining and manufacturing operations, including experience with such new metals as titanium.

a Airborne cable drum type hoist, hydraulic or electric drive. Holds 150 feet of cable, lifts and lowers 800 pounds at 50 feet per minute.

b Cable drum type actuator: spooling capacity 20' of ¼" cable. Maximum cable pull 6500 lbs. Variable speeds available. Hydraulic motor powered. Direction, reversible.

c Turbine powered auxiliary power unit: one of the many types of turbine powered designs produced by Western Gear engineers. Unit shown provides main reduction with integral accessory drive pads.

d Generator drive: mounts on gas turbine driving two generators for auxiliary power supply. Utilizes self-contained pressure lubrication system.

e Horizontal stabilizer actuator unit: AC and DC powered providing three speeds for manual, autopilot and coarse control.

f Rotary actuator: one of hundreds of basic designs. Unit illustrated powered by both hydraulic and electric motors.

g Radar equipment: typical example of Western Gear precision unit made specifically for radar equipment.

h Fine pitch precision gearing: designed and produced for electronics, aviation and rocketry.

i Starter drive: one of our probe type starter drives developed to reduce airborne equipment weight.

j Accessory drive gear box: for use in conjunction with starter shaft for transmitting starting power to engines.

Sixty-six years of experience in the production of gears and special machinery, whether prototype or production line unit, can be invaluable to you in the solution of your problem. This store of knowledge is available for immediate help without obligation. Feel free to call on us at any time for information. Address inquiries to Executive Offices, P. O. Box 182, Lynwood, California.

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Temperature and Humidity Tests provide vital performance statistics that insure optimum performance of Du Mont equipment even in steaming jungles or polar ice caps.

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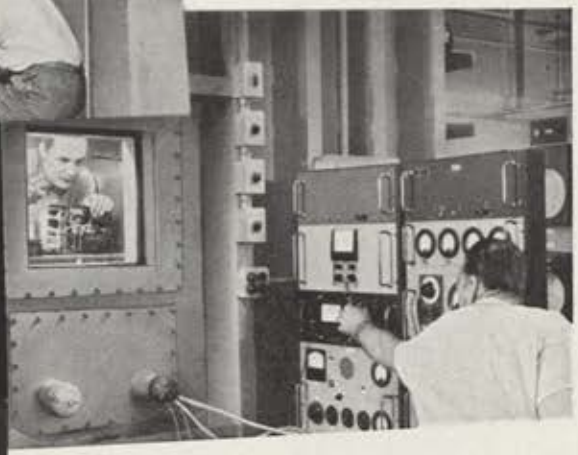
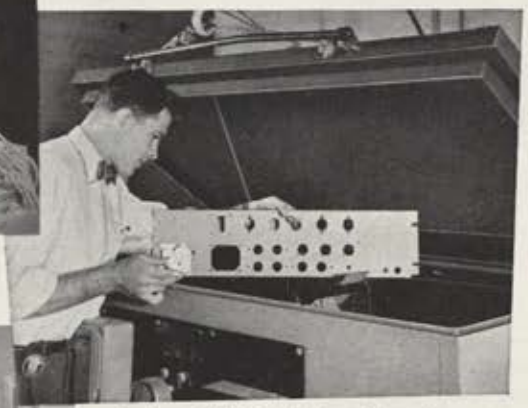
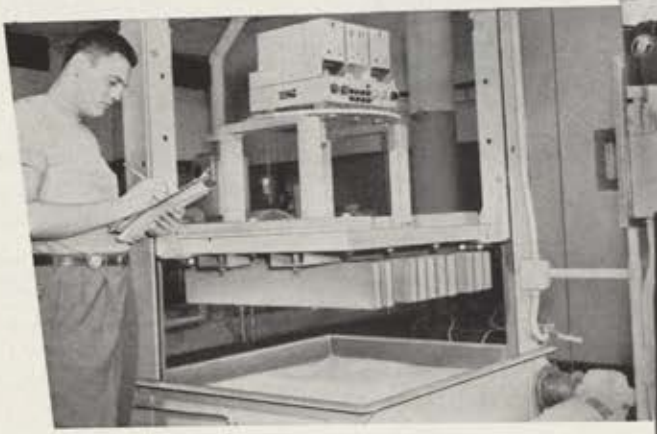


Altitude Test Chamber simulates atmospheric pressures and temperatures to prove superior performance of Du Mont equipment for high altitude flying.

Here, Du Mont equipment undergoes vibration tests to guarantee its operation under extreme conditions.



Sea-borne Du Mont electronic gear also receives exhaustive tests like this salt spray which establishes the fact that Du Mont equipment will perform under such extremes of exposure.



Grueling Drop-Shock tests prove that Du Mont equipment will continue to operate under extreme stresses and strains.

Explosion Chamber tests of Du Mont equipment verify its safe operation in the presence of explosive fumes.

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Allen B. Du Mont Laboratories, Inc. Executive Offices, 750 Bloomfield Avenue, Clifton, N. J.

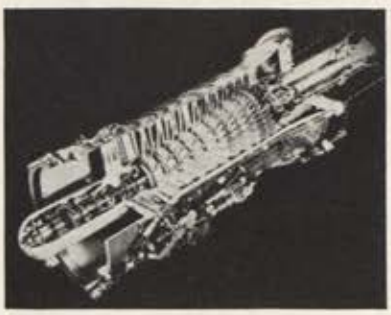
The time, place and vehicle remain classified—Westinghouse turbojet engines have flown faster than any turbojet engine in the world.

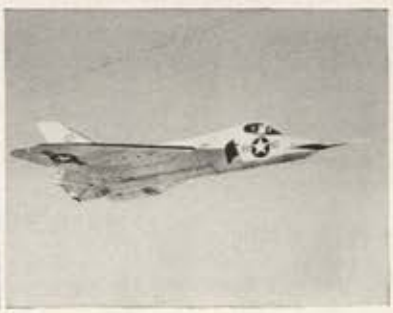
Such record-making comes from more than a decade of Westinghouse experience in the design and construction of axial-flow turbojets. And this experience is constantly at work producing new applications, new ratings, new efficiencies—for use in missiles, fighters and bombers.

You are urged to take advantage of this experience—and the research, development and production facilities behind it. Whatever your airframe or weapons system application may be, let Westinghouse help you bring tomorrow's aircraft . . . One Step Closer.

Aviation Gas Turbine Division, P. O. Box 288, Kansas City, Mo.

J-91023





"FASTER THAN YOU THINK" is the title of a new movie about the Westinghouse family of turbojets. It presents features of Westinghouse engines which have set records for speed, endurance and availability. This includes scenes of the XF4D-1, world's record holder; and the J34 turbojet, having best specific fuel consumption in thrust and weight class. If you'd like to see the 17-minute film, check with your Westinghouse AGT representative.

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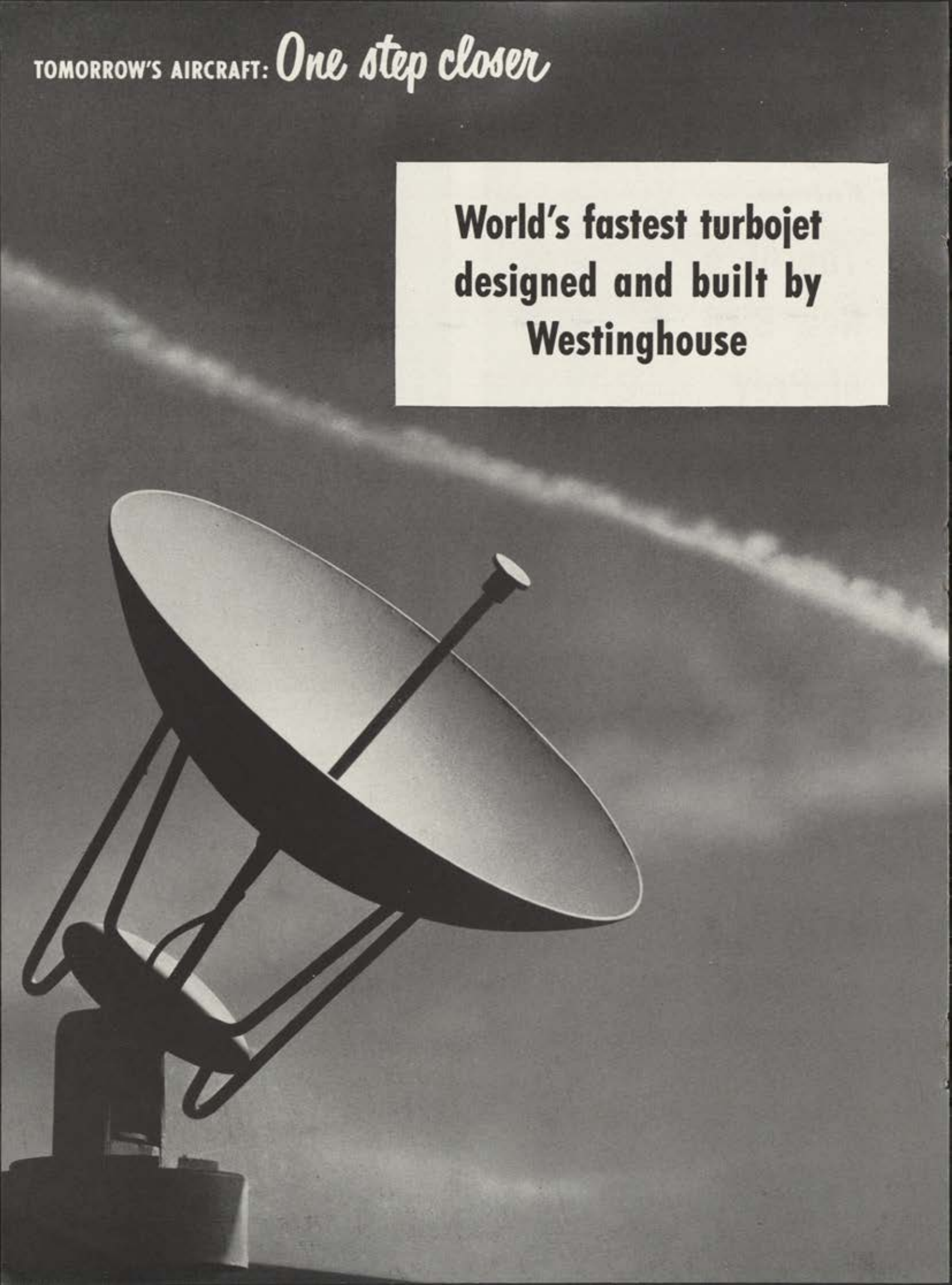
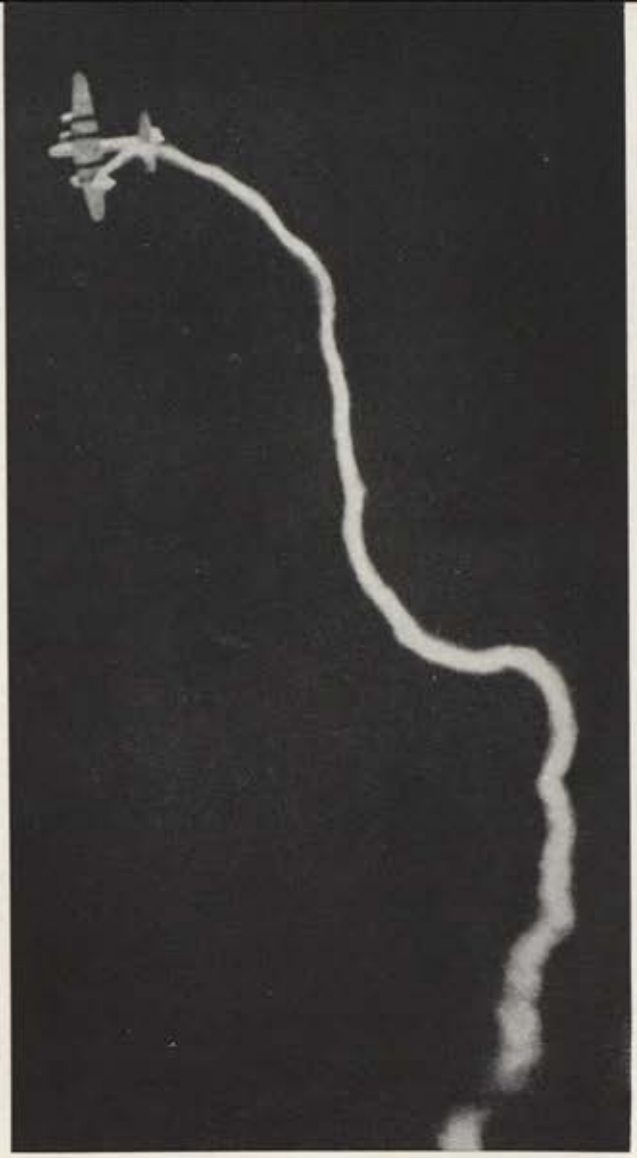


Hughes Falcon

The AF's New Bird of Prey

Swooping up from below, a Falcon missile scores a direct hit on a drone bomber.



Smoke trail left by the weapon demonstrates how it can anticipate and track down a maneuvering drone aircraft.

THE Air Force has lifted some of the secrecy from its newest air defense weapon, the GAR-1 (guided air rocket) Falcon.

Described as the only air-to-air missile with a brain of its own, it's small enough to be carried by fighters and can track down and destroy a dodging target. The Falcon, which the Hughes Aircraft Co. designed, is now being produced for the Air Force and will soon be supplied to the all-weather fighter-interceptors that guard the air approaches to North America.

As seen in the picture below, the new weapon is relatively small—slightly more than six feet long, six inches in diameter, and weighing only 100 pounds. But despite the missile's size, the Falcon's power plant provides a launching thrust "greater than that of an F-86 Sabrejet," according to Howard Hughes, president of Hughes Aircraft Co.

A big advantage of the weapon, according to Hughes, is the fact that it can be launched from beyond the reach of an enemy bomber's defenses. He also said the weapon would save time because it could be launched from a climbing interceptor, far below the bomber's altitude, and that it was extremely accurate.

The missile has electronic "eyes" and "brains," and once a target has been pointed out to it, the Falcon tracks it down at a speed faster than sound. Development of the weapon, according to Hughes, required a team of more than 1,000 men and six years of effort.—END

The six-foot, 100-pound Falcon is the smallest guided missile in production. It can be carried in small fighters.

In the high sky, a new high-performing trainer

Cessna T-37. . . Designed for Jet Training

Today's air age demands that our Air Force pilots be masters of the turbojet airplane. Jet age training requirements call for an airplane able to deliver outstanding performance at all altitudes. Also, an efficient jet trainer has to be maneuverable, safe, easy to handle—with a slow landing speed.

The T-37 performance will permit high altitude training for cadet pilots at an earlier phase of their training schedule. And, this means training cost economy.

* * *

CESSNA was given the responsibility of developing this new trainer. We are proud and privileged to join with the Air Force in planning its training program for the jet age.

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Be an Aviation Cadet.
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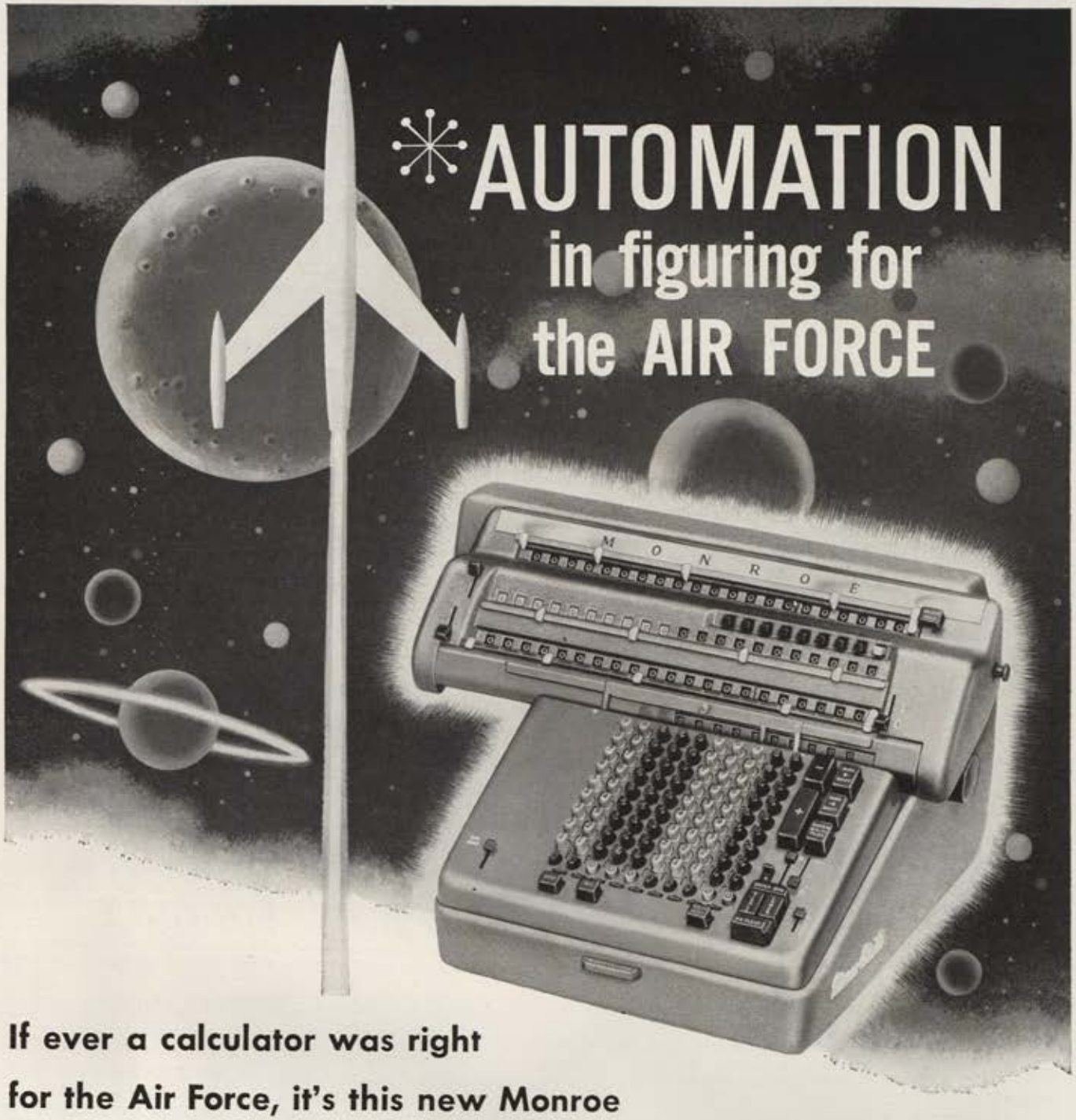


If ever a calculator was right for the Air Force, it's this new Monroe

Think of what it means to an Air Force Officer responsible for producing a figure load *fast* to have a calculator that adds as it multiplies, adds as it divides! This new Monroe Duplex Adding-Calculator reduces the job merely to feeding figures . . . pushing buttons. Now you can speed through FIA chores like supply vouchers, shipping documents, stock change vouchers, price change vouchers in a fraction of the time it used to take because this new Monroe checks line extensions and automatically and *simultaneously* totals them. And the same efficiency applies to checking invoices in the finance office, inventory in the commissary section, payroll in the civilian personnel office—everywhere there's figuring. Best of all, this most automatic of calculators is so simple that anyone—yes, anyone—can be taught to operate it in minutes. See how! You can, quickly, by calling in the nearest Monroe representative. Monroe Calculating Machine Company, Inc. General Offices, Orange, N. J. Branches everywhere.

OPERATORS WHO KNOW... PREFER **MONROE** *CALCULATING, ADDING, ACCOUNTING MACHINES*

qualify for jet training. Why not take these pilots and change their primary duty to that of jets?

I hear your question—So where do we get pilots for the transports?

Answer—From Air Force culls!

As one of the culls (and my case is rather typical), perhaps I can clarify this term. Having an intense desire to fly, I volunteered for the cadet program and after passing all examinations, met the board. The board recommended and urged that I return to college and complete my last six months. While I was following this advice the cadet program was closed to married men. Still wanting to be in the Air Force, I went though OCS, and then applied for the radar observer program; qualified, and waited. Suddenly the program was closed and all applications canceled.

In the meantime I was in a service-connected fire-explosion and suffered some loss of vision. Now I need not only a waiver for being over-age but one for sub-standard vision, too. Studies of present-day jet aces indicate that the majority are in their thirties, yet the late twenties is too old for the "prop" program. Many a senior pilot is wearing "specs," but even contact lenses won't help us culls to break into the game.

Furthermore, there are rated personnel who desire to be removed from flying status yet are not permitted to do so. In the final analysis it would be better to utilize personnel with the desire to fly and with some slight defect, than use those without defects but with little or no desire to fly.

Why isn't it possible to screen the several hundred or thousands of personnel in the Air Force who want to fly but can't because of some minor defect? Then place them in a present-day contract school and give them the normal training leading up to a multi-engine rating. The years of service in these people may be well worth the effort.

And even if the culls can't be utilized as pilots, what really prohibits their being used as a chair-bound flying observer in one of our B-29s or B-50s?

First Lieutenant
APO, New York, N. Y.

LET'S HAVE YOUR JET BLAST

In "Jet Blasts" you can sound off on any subject you want. We'll pay a minimum of $10 for each "Jet Blast" used. All letters must be signed but we'll withhold names on request. Keep letters under 500 words.

It Pays to Take a Second Look

Although the national pastime seems to be changing from baseball to criticizing the Air Force, I find the transition a bit difficult to make. It seems that many of us who wear the Air Force blue are too quick to find fault with the hand that feeds us. True enough, the art of criticism probably started long before Adam and Eve raised Cain in the wilderness, but why can't we also see the advantages and opportunity as well as the shortcomings of this young arm of defense? The question I ask is: "Are we fair with ourselves and the Air Force when making personal observations?"

A recent conversation I had with an aircraft mechanic might serve to better illustrate my point. During our conversation, I asked whether or not he planned to make a career of the Air Force. His reply was as brusque as it was immediate: "Hell, no. The sooner I get out of this damned outfit the better." After picking myself up from the floor and sitting down again, I ventured to ask why. His reply was this: "I can go to work for an airline company doing the same thing and get three times the money."

At this moment I find myself in no position to make any generalizations about the merits of Air Force opportunity vs. civilian. That is an evaluation each indidividual must make for himself.

But I would like to look at the situation involving the aircraft mechanic for what it really is. Here is a man who is leaving the Air Force as soon as he can because he is just plain bitter. Now let's see who is at fault—the airman or the Air Force. He came into the Air Force with no skill and no particular goal in life. The Air Force sent him to a technical school where he learned to be an excellent aircraft mechanic. Sure, it was a bit cold there that winter and he had to pull KP once a week, but at the same time he was getting the very education which he planned to use in civilian life.

Now, let us challenge his statement about the money deal. Will the aircraft company pay all his medical bills for himself and his family? Will he and his wife buy cigarettes at seventeen cents per pack—or go to the latest movies for twenty-five cents each? And how about the commissary, the reduced rates at the NCO Club, the $10,000 life insurance policy free of charge? I could go on and on, but I think by now I have surely illustrated my point. We talk before we think. We are too quick to discover the ills and ignore the advantages.

The Air Force undoubtedly has its share of shortcomings. I think all of us will admit that. It would be impossible for an organization so vast and complex to be perfect. Granted, constructive critimism is healthy for any organization including the Air Force. But, in our evaluation let's be fair when we total up the debits and the credits.

Instead of thinking in terms of what's wrong with the Air Force, let's take a look at what's *right* about it. In the first place, we do not maintain the world's strongest Air Force just for the sake of having it. We have learned through experience the only way to obtain peace is to be prepared for war. To meet this challenge it has become necessary to call upon the youth of America as we have always done in the past. Before, our young men were called out to win a war. Today, we are here to preserve the peace. The difference is simply this: Many of us soon get the feeling of insignificance because we are showing no accomplishment. By accomplishment I mean we aren't winning a physical war. The pilot trains rigorously to learn battle maneuvers, but doesn't go into battle. The gunner studies hard to learn the art of shooting down an enemy plane but never gets to try his skill. It's like training a football team to perfection and never putting it into action. The players soon forget what they are training for and begin complaining about the plays, the coach, and virtually everything else.

The same thing seems to be happening with the personnel of the Air orce. I'm sure none of us wants war but we hunger for accomplishment. For the personal satisfaction that comes from seeing tangible results. Consequently, to let off the tension and steam we are inclined to find fault with just about everything we come in contact with.

Now that we have established the necessity for our existence, let's take a look at our existence. Is it unfair to give a man a month's paid vacation a year plus a three-day pass once a month? Is it a "raw deal" to have our dependents accompany us overseas? Sure, some bases don't have adequate medical facilities. Some of us have been victims of a frozen career field and failed to get our promotions as we deserved them. But, do we not allow the Air Force time to grow? What can we expect overnight? I think if we all look into our past just a few months we can see marked improvements in the things most discomforting to our everyday military lives. Are large complex civilian firms without similar shortcomings and disadvantages? I think if we all will be honest with ourselves, we'll find that we are not dissatisfied, we are only anxious to find perfection. A typical American trait.

Digging a bit deeper into this matter, let's look at it for its face value. For the young man who is interested only in meeting his military obligation and then returning to civilian life, there is untold opportunity. To start with, he will probably go to one of the Air Force's technical schools and learn a skill which would cost him a great deal of money if he were to pay for it by himself. After school he will spend at least three years in this skill, gaining the experience needed to bargain with commercial competition. He gets paid for learning and he gets paid for practicing. He goes back to civilian life with bargaining power—experience with a cash value!

For the career men, there's the best retirement plan in the business. After a few years' service, his salary, counting his many benefits, is commensurate with that of his civilian counterpart. During a twenty- or thirty-year stint, he and his family will probably have the opportunity to live on half the continents in the world, expenses paid. The Air Force is like everything else. You get out what you put in. You get what you pay for.

I say, let's continue to offer constructive criticism. Let's continue to grow. Let's continue to have the best Air Force in the world. But, let's also be fair in our analysis of the situation. Let's see the Big Picture!

Sergeant Claar
Wright-Patterson AFB, Ohio

Place for Culls

There is one field of manpower waste in the Air Force that still remains to be checked—and perhaps remains even to be thought of!

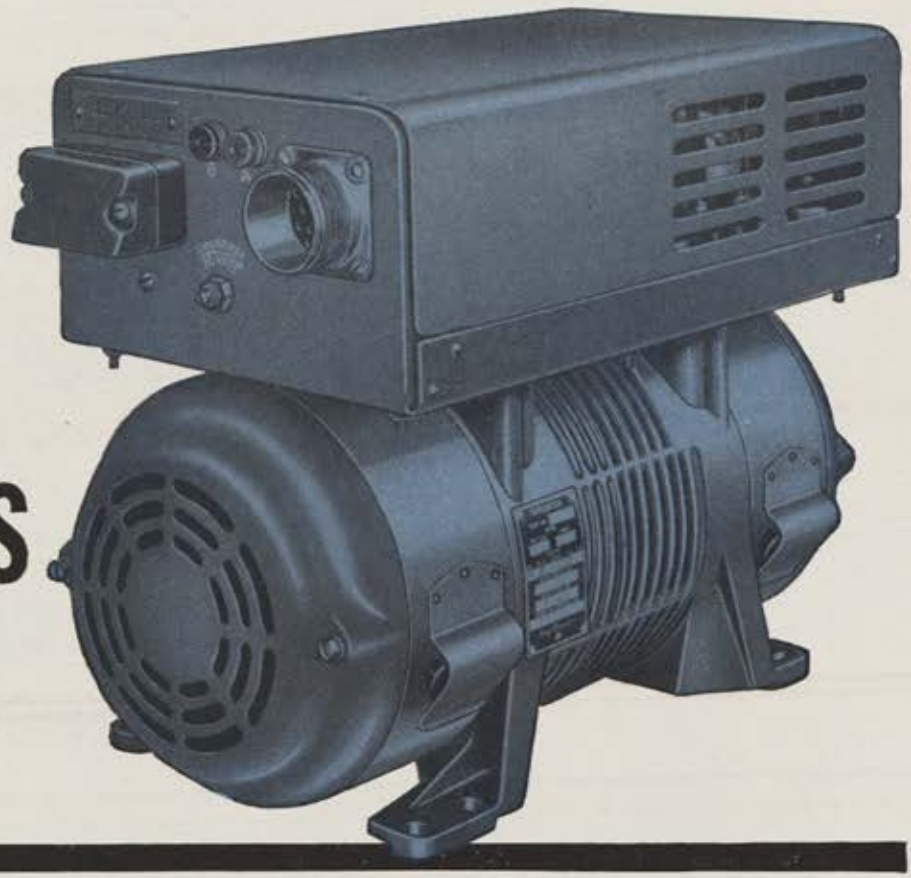
As the Air Force expands, there arises a need for more pilots and rated personnel. What to do? Well, here is one man's solution. It seems evident that the Air Force will always need multi-engine pilots for transport type (C-47, C-54, C-119) aircraft. Yet many of these ratings are now held by pilots who are or could

(Continued on following page)

New 3-Phase

HIGH ALTITUDE INVERTERS

deliver full load at 50,000 feet!



Truly effective, upper altitude performance

The new Jack & Heintz inverters, Models F138-1 and F148-1, deliver full-rated load up to 50,000 feet, half-rated load up to 65,000 at +20°C ambient! Performance is increased; size and weight reduced . . . with diversity of outputs available as shown in the table below.

Unrestricted air flow solves heat problem

Self-ventilated and self-contained, these inverters utilize a large commutator with staggered brushes. Air flows freely over commutator and through the unit. Fans are mounted on each end of the rotor to cool the a-c and d-c sections separately. Partial bleeding of this air cools the control box.

Installation and maintenance advantages

A single, compact, plug-in control unit combines both frequency and voltage controls. New two-stud d-c terminal block for d-c input connection is provided . . . plus an AN connector for a-c power output. This connector and voltage adjustments are mounted on d-c end of control box for easy installation and maintenance.

Jack & Heintz builds special high altitude inverters or other electrical equipment to meet your *specific* needs. Write Jack & Heintz, Inc., 17640 Broadway, Cleveland 1, Ohio. Export Department: 13 East 40th Street, New York 16, N. Y.

OPERATING CHARACTERISTICS	F138-1		F148-1	
	Three Phase	Single Phase	Three Phase	Single Phase
Output Rating				
Full Load va, Sea Level to 50,000 Ft	1500	1250	2500	2250
Full, 50,000 Ft to 65,000 Ft	750	750	1250	1250
A-c Voltage—Volts	115/200	115	115/200	115
Voltage Range—All Environments	110-120/190.5-208		110-120/190.5-208	
Frequency Range—All Environments (cps)	390 to 410		390 to 410	
Power Factor	90% Lag to 95% Lead		90% Lag to 95% Lead	
Input Voltage—d-c (volts)	26.0 to 29.0		26.0 to 29.0	
Ambient Temp Limits at Sea Level—F. L.	−55°C to +85°C		−55°C to +85°C	
Ambient Temp Limits at 50,000 Ft—F. L.	+20°C Max		+20°C Max	
Drawing Specifications	54A38806		54A38807	
Design Specifications	AN-I-10b		AN-I-10b	
Weight—Lb	43		60	

Military specification numbers as used herein are for purposes of product identification only and do not necessarily imply specification conformity.

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Start on your way up with Avro Aircraft

AVRO AIRCRAFT NEEDS THESE ENGINEERS NOW

Aeronautical engineers for work on structural and mechanical design, structural systems testing; stress; aerodynamics; flight testing.

Mechanical engineers for work on mechanical design; structural and systems testing; structural analysis; thermodynamics.

Civil engineers (structural). Openings for recent graduates to work on aircraft structural analysis.

Electrical engineers and engineering physicists for work on aircraft electronic systems engineering (telecommunications; radar and fire control; aircraft stabilization); electronic instrumentation development; automatic computors; servo mechanism development; telemetry; flight test.

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Take time today to write to the Personnel Manager, Avro Aircraft, Box 4004, Terminal "A", Toronto, outlining your qualifications. Your application will be kept in strict confidence.

Our expanding development program at Malton on the most important aviation projects in our history assures you of an excellent salary and a future with Canada's foremost aeronautical enterprise. Contributing to that security are extra benefits . . . opportunity for further education . . . retirement income scheme . . . generous health, welfare, hospitalization and group life insurance, etc.

AVRO AIRCRAFT LIMITED

MALTON, CANADA

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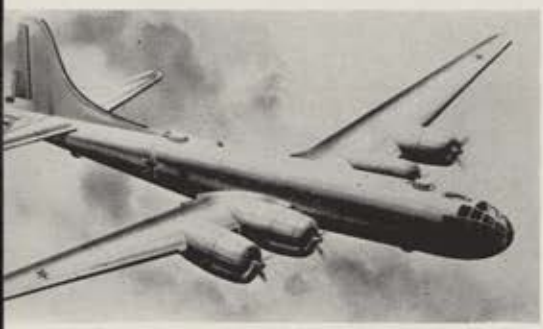
Member of Hawker Siddeley Group

Japanese steel mill in Manchuria and when he developed engine trouble, he knew he couldn't make it back to base, but Russia was an ally and he could reach Vladivostok easily. With two bombs dangling precariously in his bomb bay, Jarrell gave an order to destroy the Norden bombsight, then brought the plane down intact near Vladivostok. He was given a hero's welcome. But while the American crew went on a cross-country tour, crack Soviet designer A. N. Tupolev went to work and copied the Superfort.

By 1947 the Soviet Air Force had its first ten-plane squadron of Tu-4s—translation: B-29s. As the cold war got



Tu-4, Russian copy of our B-29, is still the backbone of the Red strategic air arm, though new long-range jet bombers are now in production.

hotter and Russian nuclear weapons grew bigger and heavier, the old Tu-4 was modified, worked over, and improved. There was also a troop-carrier version of the Tu-4, a reported fighter-escort mother plane with two fighters hooked under the wings, and a photo-reconnaissance version.

While the Bison could probably reach the continental US targets from Siberian bases, the Russians apparently do not rely on the "heavies" entirely. The development of their medium and light bombers received enough encouragement from the planning echelon to produce the Badger.

Believed to be in the 3,000-mile combat radius class, the Badger is probably the counterpart of the B-47. The general lines of that graceful twin jet bomber bear the trademark of Iliushin. The modified crescent wing has a little lower aspect ratio than that of the Bison. It has four flow fences and two peculiar streamlined bumps, one on the trailing edge of each wing. One report claims that these bumps are housing for main landing wheels that retract backward. Another source suggests that the bumps are rocket motors for assisted take-off from small advanced bases and for extra bursts of speed in combat. Neither of the reports has been confirmed at this writing although the latter seems to make more sense. Of course, there is another possibility—the bumps may be just external fuel tanks.

Following the Russian practice of arming their fast bombers to the hilt, the Badger has a manned tail turret with two 20-mm. cannon and radar gunsight. What the fuselage armament is the report does not state, but there is one central remotely controlled gun turret and one dorsal turret immediately behind the crew compartment.

Power is supplied by two 15,000-lb. static-thrust jets buried in the wing roots. The turbos are said to be the same type that push the Bison along and are credited to Soviet thermodynamicist Andrei Kostikov.

In the same class as the Badger is the controversial Type 150. Reports from Russian and satellite sources mentioned Dr. B. Baade, a German plane designer, as being in charge of the development of the Type 150. The story of Type 150 typifies Russian methods of exploiting slave brain and brawn. At the end of the war, Dr. Baade had been responsible for the development of an advanced Junkers design at Leipzig-Mockau plant. Plant and personnel fell into Russian hands. Russian technical intelligence had strict orders to protect *all* enemy equipment and to root out the scientists, engineers and mechanics. Immediately upon the occupation of Leipzig, Dr. Baade, twelve technicians and two test pilots were rounded up and shipped to Moscow, together with the prototype of the Junkers EF-125—Dr. Baade's latest jet medium bomber.

When the Type 150 took to the air, it had the unmistakable Junkers fuselage, a "T" tail, and two jet pods each housing a Lulkov-4, 11,200-pound static-thrust turbo. Unlike its predecessor EF-125, the Type 150 had swept, shoulder-high wings which gave it a high critical Mach number and a reported speed of 600 mph at sea level. The plane carried a three-man crew and an unspecified bomb load.

Before the appearance of Bison and Badger, the Russian airmen leaned heavily on tactical bombers, some of which were pressed into long-range work. The most popular light bomber is the Iliushin-28—the Butcher. In the same class as our RB-45, the twin-jet, straight wing, swept empennage, IL-28 lacks range, but there undoubtedly is feverish Russian action on refueling techniques.

Russian standardization of equipment makes for fewer types and simplifies production schedules. The MIG-15, for example, appeared as a prototype in May 1949, and a year later the fighter was in squadron service. This was made possible by the tight control of the aviation industry by the Kremlin and by the total disregard of labor problems. The Russian aviation industry reportedly employs more than 500,000 workers plus about 100,000 slave laborers. A western aircraft manufacturer has to take time to work out new schedules and taper off the old model production as the new one is being eased in. Russian production czars handle the problem differently. Production of an old model stops, surplus workers are laid off, and the work on the new model begins immediately. Entire plants are known to have been shut off without a day's notice. Thousands of workers have been loaded on freight trains and shipped to a new location thousands of miles away.

These ruthless though effective methods must be taken into consideration when we try to figure out the lead time on a new Russian model. The lead time is the time elapsed from the Air Force "okay" of a new model until reaching a reasonable production volume. Under pressure of war, the lead time on the F-80 was just over two years while without any particular pressure, the MIG-15's lead time was about one year. The same applies to heavier aircraft, and if the public appearance of the Bison and the Badger in May 1954 can be regarded as the Kremlin's approval, we might expect the production to be in full swing in about two years. It means that by the spring of 1956, the ADD could be ready to strike. Of course, Russia might not strike in 1956, or ever, but we cannot afford to gamble or guess.—END

ADD MEANS SAC — CONTINUED

They put flat glass panels wherever they could and placed them at right angles to the pilot's line of vision to avoid refraction.

However, the crew of the Bison need not depend on vision alone. A large radome under the plane's "chin" suggests full radar equipment. A small bulge under the tail probably houses radar gunsights for the two tail cannons.

There is disagreement as to dimensions. Quoting German sources, US publications have given the Bison span as 165 feet; length, 150 feet; and weight, 250,000 pounds. Swedish sources, on the other hand, suggest lower figures—span, 120 feet; length, 110 feet; weight, 180,000 pounds. Personally, I favor the higher dimension figures.

The shoulder-high position of the wing and its thinness suggest an undercarriage similar to those of the B-47 or B-52. The main wheels probably retract into the fuselage while the outrigger wheels might fold into the wing. To reduce landing speeds, Fowler-type flaps are reported in use, as well as a parabrake. However, one eyewitness reports two landings of a normal length of ground run and without parabrake. This might indicate that the flaps are efficient enough and that the parabrake is carried for emergency landings only.

The Reds' most popular light bomber, the Butcher, first appeared in 1950.

Latest reports say that the Bison, whose Russian name is *Molot*, or hammer, is already in limited production. Meanwhile, the Tu-4 units train the combat crews for the new, long-range jets. To get accustomed to the ten- and twelve-hour missions the jets will fly, the crews are sent on twenty-four-hour training missions. Crew members can rest and sleep aloft although there are no galleys for hot meals. Standard cold rations are carried and, occasionally, hot tea is provided in thermos bottles.

In the summer of 1944, an AAF captain unwittingly provided the Russians with the nucleus of their strategic air. Flying his B-29 out of a Chinese base, Capt. Howard Jarrell bombed a

(Continued on following page)

TWINING — CONTINUED

soon as the crews complete training, these units will be combat-ready again. . . .

Our medium bomber units have been almost completely converted from propeller-driven B-29s and B-50s to jet B-47s. By early 1956 this conversion will be completed. During this year we will begin to replace the B-36 with the B-52, heavy jet bomber. We will further increase the performance of our bomber units by the use of jet tankers. . . .

The jet tanker will enable our jet bombers to be refueled at high speed and at high altitude. Since these conditions are the most efficient for jet aircraft, use of jet tankers will give us a considerable increase in the range of our jet bombers. . . .

We require considerable airlift to make these combat forces mobile. It is our responsibility to furnish airlift to the other services. This is done by the Military Air Transport Service. The allocation of MATS airlift to the various services and to overseas commands is decided by the Joint Chiefs of Staff. . . . In addition to MATS and the wartime Civil Reserve Air Fleet, we have a number of medium troop carrier wings for tactical airlift of the Army. . . . Our plans for the future provide for a fifty percent increase in total Air Force airlift by 1960.

All of these increases in size and the improvements in combat readiness are predicated upon our present program of base expansion and construction. . . . In modern war, an air force must be dispersed to withstand attack and be able to strike back. When we have to crowd our bases we are offering a potential enemy a more profitable target.

Housing is directly related to our base program. It also affects our expansion and our combat readiness. For example, a shortage of housing on or near the base limits the effectiveness of our air defense forces. If we have an all-out alert, it takes off-duty personnel far too long to get to their planes and stations. . . .

The main challenge we must meet to keep our readiness high is that of quality. This means quality in both men and equipment. The new military pay bill . . . will be a great help in attracting and retaining highly qualified men. . . .

In this age of revolution and great advance in air weapons . . . it is [essential] to maintain our technological lead over the Communists. However, I sometimes feel that the difficulties we face in research and development are not altogether understood. . . .

[For example,] at sea-level speeds of less than 1,000 miles an hour, aluminum gets so hot that it loses its strength. At this speed, our plexiglas canopies have softened and lost their shape. This means that we must find new materials or new ways of using old materials. . . .

A second problem is range. Once we get high-speed aircraft that can stay airborne for long periods of time, many of our operational problems will become much easier. . . . We are making good progress toward our goal of unlimited range—the nuclear-powered airplane.

Nuclear power revolutionized air weapons. We believe that nuclear propulsion will revolutionize flight. It will be a big job. Fitting a nuclear power plant into the design limitations of high-speed aircraft is one of the most difficult engineering projects we have ever tackled.

Another very important research and development area is in the field of missiles. Guided missiles are becoming an increasingly effective element in Air Force weapons systems. . . . We now have three intercontinental missiles under development. These are the Navaho, the Snark, and the Atlas. The most important of these is the ICBM—the Atlas. It will be powered by rocket motors and develop speeds of several thousand miles per hour. . . .

It is one thing for us to demand technical superiority and another to achieve it. We cannot be successful without highly qualified scientists and engineers and they must be given the resources that modern research and design require. The qualitative battle of any World War III is being fought right now in our laboratories. Whether we like it or not, we are in a technological race that we cannot afford to lose.—END

Freedom's Team

At outposts of freedom near the Arctic Circle–made possible by our agreements with other governments which stand with us against aggression – U.S. Air Force men are now standing around-the-clock, around-the-calendar guard. Backing them up are the resources of American science and industry which have produced the Northrop Scorpion F-89 all-weather interceptor. The F-89 is America's heaviest-armed fighter. Wing-tip "hornet's nests" which carry 104 rocket projectiles are coupled with the latest electronics to make the F-89 a deadly aerial destroyer, capable of striking a bomber 45,000 feet and more above the earth. These jet home defenders are one of many modern weapons created by the engineering and production complex of Northrop Aircraft, Inc., since 1939 America's first company in the vital design, development and production of all-weather and pilotless aircraft.

NORTHROP

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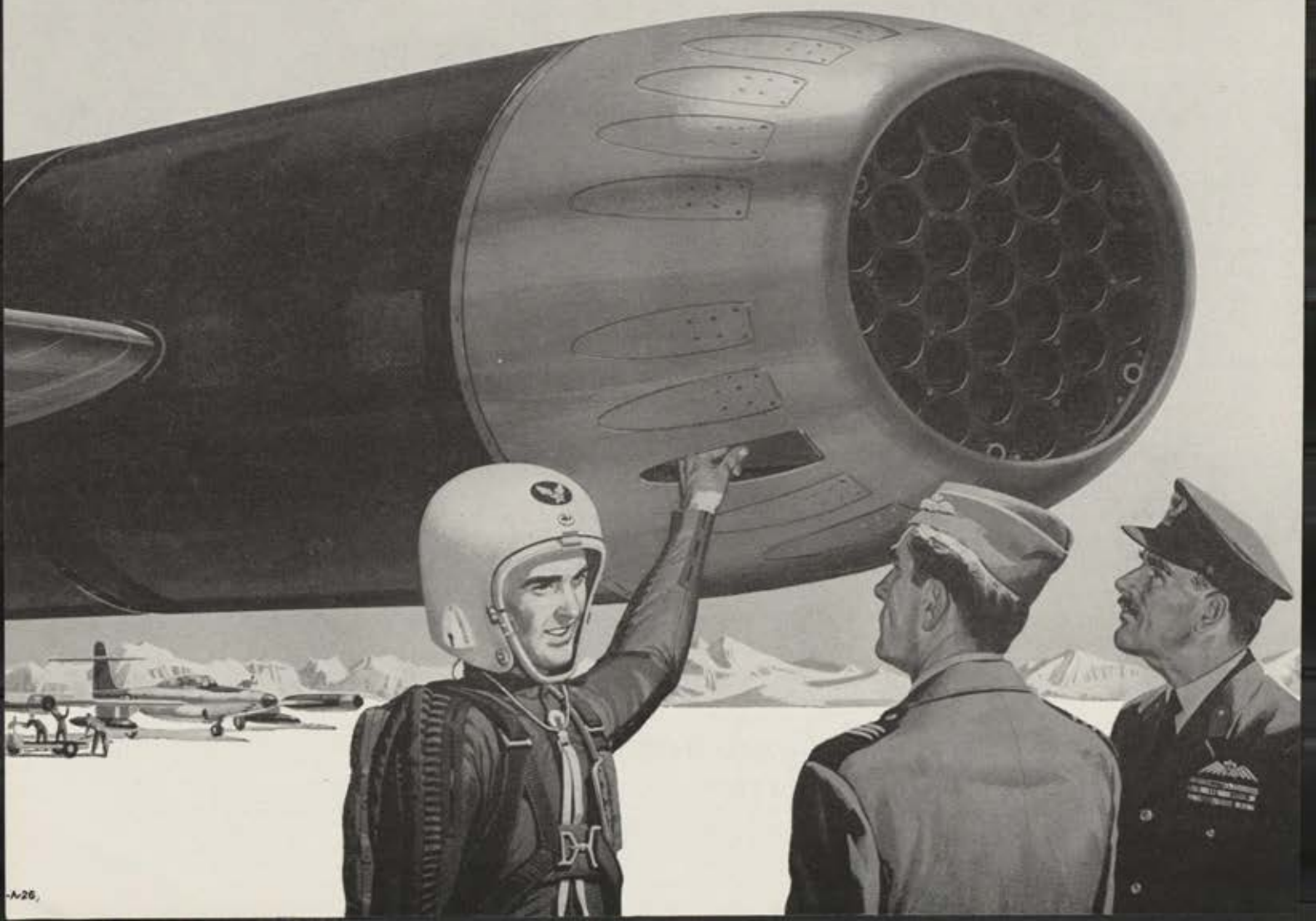
Pioneer Builders of All Weather and Pilotless Aircraft



A-26

One of a series telling how the producing companies of General Precision Equipment Corporation are contributing to America's progress.

advanced techniques & resources

The producing companies of General Precision Equipment Corporation are engaged in the development, production and sale of advanced technological products. Each of these companies specializes in particular areas of advanced competence and possesses highly developed techniques and resources in its particular field or fields. These are the building blocks of GPE Coordinated Precision Technology, through which GPE serves more than a dozen important industries.

The chart at the left shows the areas in which each GPE Producing Company works. But it cannot show the high degree of specialization and the important position each GPE Company occupies in its field or fields.

Take **TELEVISION,** for instance, and the work of General Precision Laboratory Incorporated, the GPE leader in the field. GPL's research, development and manufacturing activities in TV are concerned with quality equipment for theatre, studio, business, industrial, institutional and military TV and do not relate to the home TV field. In all the areas in which GPL operates it has played an important part in the making of television history.

¶ GPL equipment was used for all video recording of the Coronation, both U. S. and Canadian. It is used by 90% of the studios equipped for video recording.

¶ The first appearance of a President on closed-circuit TV—President Eisenhower speaking from the White House to distinguished guests at the dedication of the Ford Research Center in Dearborn—was projected via GPL equipment.

¶ High quality portable projection equipment, newly developed by GPL, enabled guests assembled in several separate ballrooms of the Waldorf-Astoria to see and hear the Queen Mother at two New York dinners last Fall; made possible the historic 53-city TV hook-up which was a feature of GM's fifty-millionth car celebration. This equipment played a key role in the recent nationwide "heart-video-clinic"—the largest meeting of its kind ever held—attended by over 20,000 heart specialists in thirty-five cities. It is rapidly making closed-circuit TV a practical, everyday business and institutional meeting medium.

¶ Many broadcast studios, including CBS's famous TV 61—the largest in the East, are exclusively equipped with GPL cameras and control equipment.

¶ New uses are developing steadily for GPL's "Bullet," the new, portable, easily operated, industrial television camera: in banks to speed service, eliminate congestion and reduce personnel costs; in railroads to better control and speed train make-up and freight car loadings; in industry to monitor and improve manufacturing processes, for surveillance and security, and to view hazardous operations.

GPL is a leader in military TV with its special and exacting requirements for airborne, shipboard and under-water uses and is also at work on color TV. A color film camera chain of high quality, for studio use, is in production and additional color equipment will be announced in 1955.

A broad description of the work of GPL and the other GPE Companies is contained in the GPE brochure, "Serving Industry Through Coordinated Precision Technology." For a copy, or other information, address:

The "Bullet" TV Camera; for industrial, institutional and educational use. Produces useful pictures under conditions of poor light; feeds any TV receiver or monitor; unique packaging permits placement in ordinarily inaccessible areas; unitized construction with plug-in component chassis minimizes maintenance requirements.

Projection TV System; projects bright, clear pictures on screens from 3' x 4' to 9' to 12'. Completely self-contained; easily transported; set up in matter of minutes; does not require skilled operator. Designed especially for closed-circuit meetings in hotels, clubs, auditoriums.

Remote Control TV Camera; for broadcast and industrial use. Pre-set control permits memory of 6 different shots. Mounted on servo-operated pedestal, provides complete remote control of lens selection, iris, pan and tilt. Highly useful for observing dangerous phenomena; permits broadcasting without use of camera man.

General Precision Equipment Corporation

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GPE

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serving industry through coordinated precision technology

● Manufacturing
●● Manufacturing and product development
●●● Manufacturing, product development and research
□●● Pilot manufacturing, product development and research

	KEARFOTT COMPANY, INC.	INTERNATIONAL PROJECTOR CORPORATION	BLUDWORTH MARINE DIVISION	GENERAL PRECISION LABORATORY INCORPORATED	THE GRISCOM-RUSSELL COMPANY	LINK AVIATION, INC.	THE HERTNER ELECTRIC COMPANY	THE STRONG ELECTRIC CORPORATION	J. E. McAULEY MFG. CO.	ASKANIA REGULATOR COMPANY	AMPRO CORPORATION	LIBRASCOPE, INCORPORATED
PRECISION MECHANICS, OPTICAL DEVICES, CERAMICS	●●●	●●	●●	□●●	●●	●●●	●●	●●●	●●	●●	●●	●●●
ELECTRICAL EQUIPMENT and COMPONENTS	●●●	●	●			●●●	●●●	●●	●	●●	●	●●●
ELECTRONICS	●●●	●●	●●●	●●●		●●●	●	●●		●●●	●●	●●●
HYDRAULICS, LIQUIDS PROCESSING, HEAT EXCHANGE		●●			●●●					●●●		
TELEVISION *Studio, Theatre, Educational, Business, Industrial*	●	●		●●●		●				●		
INSTRUMENTS, SERVOS, CONTROLS *Hydraulic, Pneumatic, Magnetic, Electronic*	●●●	●	●●	□●●		●●●	●●	●●		●●●	●	●●●
AIRCRAFT and MISSILE GUIDANCE, CONTROL, SIMULATION	●●●	●		●●●		●●●	●			●●	●	●●●
AUTOMATIC COMPUTERS and COMPONENTS	●●●	●	●	□●●		●●●				●●●		●●●
RADAR, MICROWAVE, ULTRASONICS	●●●	●	●●	●●●		●●		●		●		
MOTION PICTURE and AUDIO EQUIPMENT		●●●		□●●			●●	●●●	●●●		●●●	
NUCLEAR POWER COMPONENTS and CONTROLS	●●●				●●					●●		●●●
SYSTEMS ENGINEERING *Aeronautical, Naval, Industrial*	●●●			●●●	●●●	●●●				●●●		●●●

THE GPE PRODUCING COMPANIES

No elephant guns were used on rabbits when pilots of the Far East destroyed 1,210 bridges, 963 locomotives, and 82,920 supply vehicles, not to mention 1,020 enemy aircraft, 839 of which were MIG-15s; while in air combat only fifty-eight USAF Sabrejets were lost. This represents an over-all ratio of over fourteen MIGs destroyed in the air to the loss of one Sabre!

Supply movements were a nightmare for the enemy, to paraphrase Secretary Talbott, and 266,000 enemy troop casualties were inflicted. Only victorious air battle would have permitted this punishment of the enemy.

The last two years of the war, according to General Weyland, and as supported by Gen. James A. Van Fleet, was a politically enforced stalemate on the ground. Surface forces were prohibited from advancing because of the fear that such an advance would extend and enlarge the war. The only extended offensive activity open to UN forces was air action between the front lines and the Yalu, using World War II types of munitions.

This limited air action was vigorously undertaken until rail traffic in North Korea was cut to five percent of its prewar level. Truck and A-frame transportation were able to keep the dug-in Communist horde supplied for defensive stands, but denied them the supplies necessary for a general offensive. Since, according to Van Fleet, political restrictions prevented our ground forces from taking the offensive, a stabilized front obtained for two years. The UN objective was *not,* then, to take and hold ground. The objective was unquestionably to force the Communists to come to terms acceptable to us. The cost of the war to them caused by attrition through our air attack was what led directly to the conclusion we sought.

Could this have been done without ground troops and the heartbreaking American losses of American infantrymen? In all probability the precise effect could have been achieved. True, South Korea would have been punished as sorely as North Korea. But the North Korean bombing was suffered by people who had come under the yoke of Communism through no fault of their own. Many are undoubtedly friendly to democracy and it is unlikely that bombing will turn them to Communism unless they are already disposed to lean in that direction, any more than our bombing of France in World War II caused Nazi converts. We might bear in mind here that only fifty percent of all bombing in Europe during the Second World War struck on German soil. Most of the other fifty percent hit objectives in countries where the populations were friendly to our cause.

We bombed North Korea without compunction because only in that way could we make the Communist masters suffer. This is war, air or ground. In retreat, we would destroy our own transportation, supplies, industries, and communications to prevent them falling into the hands of the enemy—even though we leave behind thousands of Americans to suffer. The Shenandoah Valley campaign and Sherman's march through Georgia attest to this. Russia's scorched-earth policy in the last World War provides another example of a common military necessity. Yet many contend that air action is too destructive to be used in limited war except to support surface forces. It seems rather shortsighted to point the accusing finger at airpower when it performs necessary and traditional functions of war with greater facility and at less cost to the user.

Can airpower be *too* effective in war? Is it because not enough airmen are killed in proportion to the offensive effects of air attack that some people condemn this mode of warfare and prevent it from being fully exploited? The French military philosopher Ardant DuPicq wrote that the first principle of war was to "attempt to overcome the enemy with least possible self-injury."

A single A-bomb planted on this North Korean airstrip would have done the job better than mission after mission by the workhorse B-29s, which knocked out enemy strips with "conventional" bombs.

What warped thinking inspires some people to want our *own* troops to be slaughtered as a necessary condition of war? If machines in the air overcome the enemy with least self-injury to the crews, is not this what we want? In the world condition we face today, do we not wish to find an antidote for the huge manpower opposing us?

We have the antidote in our technical proficiency. But if we fail to fully exploit this technical capacity, the antidote will be neutralized by a progressive enemy who eventually will fully integrate the most advanced mechanization with his tactics and strategy. It is a never-ending race of progress in the military art. We must not only stay in the lead technically, but we must lead, also, in the application of technology to strategy.

Air forces provide the ideal weapons for limited war, but to be most effective, the political restrictions applied to a limited war must favor the air weapon rather than favor enemy manpower. Obviously, no restrictions should be placed on the kinds of munitions which are best applied from the air. One atomic bomb, for example, could eliminate an enemy airfield. Why not use it instead of trucking in TNT day after day to do the same job?

Nor should any air sanctuary be permitted. Hot pursuit of invaders should not be halted at an arbitrary line and enemy airfields and supply depots used in the limited war should all be fair game. Let us hope our statesmen will consider these inherent advantages of superior airpower in limited war. The profits possible from achieving air superiority can then be realized, and the enemy paid in full.—END

FLYING HIGH (80,000 Feet)

. . . AT GROUND LEVEL

In the development of tough, dependable jet engine components for America's most advanced military aircraft, flying high at ground level is standard operational procedure in CECO's up-to-the-minute laboratories. Special equipment such as this altitude chamber simulate in-flight conditions under complete laboratory control. By creating pressures ranging from sea level to 80,000 feet, this test chamber subjects prototype jet engine controls to the same high altitudes and rarified atmospheres found in actual flight . . . thus accurately predicting in-flight performance.

It's engineering like this — starting from the ground up — which enables CECO to produce jet engine controls of the highest efficiency for America's defense program . . . and which can develop <u>your</u> basic ideas from blueprints through finished production.

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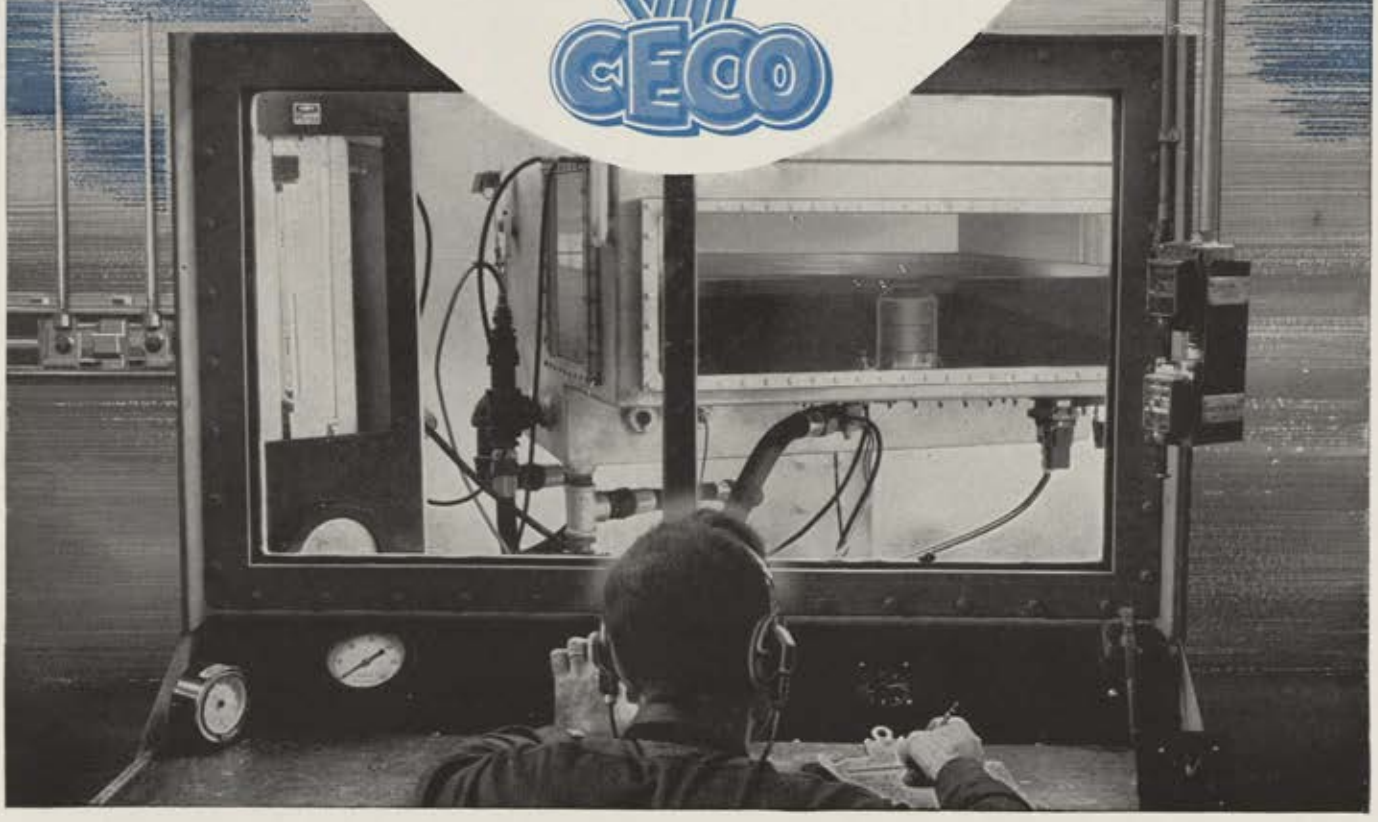


Shown here is a giant step
toward tomorrow.

Conceived and developed
by a team of Martin people
who have been working with
Navy scientists since 1946,
Viking 12 is the latest of a series of
high-altitude research vehicles.

It was designed to explore the
problems of controlled flight
in the near-vacuum conditions
of the outer atmosphere and
at speeds in excess of 4,000 m.p.h.

In this long-range Viking program,
technical problems are
continuously being solved
which support advancements that
are now being made toward the next
frontier of flight—rockets having
intercontinental ranges.

And beyond that lies space itself!

MARTIN

BALTIMORE · MARYLAND

sented a short step in the direction of using airpower as a persuasive force to attain limited objectives." The cumulative effects of simultaneous attacks on enemy air forces, surface forces, supplies, communications and control systems, including industrial, social, and political control systems, in conjunction with propaganda, provide the psychological effect which will in time terminate a local war.

Such an air siege is predicated, however, on air victory, and air victory is not fully consummated until fighting has ceased. Air battle, as opposed to air siege, is the process of overcoming enemy air opposition to the degree that air siege can be undertaken without debilitating losses. The objective of air battle is the opposing air force which must be subdued to a degree that will permit concentration of our own air force upon the later objective of bringing the enemy to accept terms. Thus, as in land operations where the opposing army must be defeated before invasion and capture becomes possible, air operations must concentrate on enemy airpower before full weight can be applied to air siege. This sequence of priorities applies to something less than absolute war, however, for in absolute war it is conceivable that siege can be made so devastating with massed nuclear weapons that air battle might be avoided.

Air battle is not decided in a few great clashes, but over a long period of time when attrition and discouragement eventually cause one side to avoid the invading air force. Like the trench warfare of the First World War, the effects of air battle are not readily discernible. Still a time comes when, through many clues and a marked reduction in losses, one side senses it has achieved air superiority.

After the successful operations of Allied air forces over Germany in February 1944, known as the Big Week, Gen. Carl Spaatz, who commanded the United States strategic air forces, sensed that air superiority had been wrenched from the enemy. In the space of six days, massive and deep penetrations had been made to fifteen large industrial areas throughout the enemy nation by some 6,000 bombers. Bombing accuracy was excellent, but it was inconceivable that bombing results would have had any immediate effect on the *Luftwaffe*. Allied losses, however, were far less than had been expected, amounting to about six percent for the six-day battle. As a consequence, Allied morale soared while enemy morale plummeted. Extensive bomb damage caused consternation among the leaders of German industry, and the obvious inability to halt these massive Allied depredations left all Germans with a feeling of futility. Industry was dispersed and reorganized under Albert Speer. By dint of feverish activity it recovered within two months. This indicates that the material effects of Big Week were far from crippling. Yet the emotional effects were decisive enough to cause a turning point in the war.

Claims of enemy aircraft destroyed totaled 600 for American forces, which according to captured German records was an accurate figure, and these records also indicate a decided upturn in German losses for subsequent months.

An abrupt change in German strategy occurred. "The enemy now refused to commit himself to a policy of full-scale opposition" to the bombing campaign. It was a policy of "conservation of strength and it conceded to the Allies the vital point of air superiority." This change in attitude was apparent in the subsequent behavior of enemy fighters. They more often concentrated on stragglers and cripples, letting the main forces go unscathed. On at least one occasion an enemy pilot was seen to bail out when an American fighter approached, and this occurred before the American fighter pilot had fired a single round of ammunition. Such clues added to the evidence that the enemy air force was psychologically beaten.

Dominating an enemy air force in this way, however, requires a sustained effort. An enemy air force can seldom be totally destroyed, and our will must continually be exerted to keep it subdued. Consequently, the anti-air objective of air battle can never be entirely relinquished until the armistice. But when air superiority is sensed, as after Big Week, the emphasis of objectives may be shifted to air siege or air support of surface forces if that be the prescribed strategy.

Dual objectives are pursued concurrently by air operations—anti-air to achieve air superiority, and air siege. There is no sharp dividing line between these objectives in point of time, and each complements the other. Bombing which threatens sensitive enemy establishments induces air defenders to rise for battle. Thus both objectives are being prosecuted on the same attacks. As with the surface doctrine of Clausewitz, overpowering of enemy air forces must be the prerequisite to any other air activity. Air forces must be assured of "living in the air" before they can concentrate on other operations.

American troops on parade. Would the use of tactical A-weapons in Korea have reduced our heartbreaking losses?

In September 1950 Red jets began to appear in Korea. The build-up of Communist airpower was most phenomenal in its proportions. This occurred because the bombing of Operation Strangle was punishing Communist surface forces and seriously restricting their offensive capabilities. So the enemy was to challenge our air superiority. The Communists began to build a number of jet air bases in North Korea for their plan to break the grip of Operation Strangle. We systematically bombed these bases until the end of the war as a preventive feature in the air battle, and the swarms of MIGs were confronted by our outnumbered F-86s over the Yalu. By the end of hostilities, the ratio of individual victories was over twenty to one in our favor. Although the enemy force was not destroyed, it was so morally dominated as to assure us acceptable air superiority.

The charge that air forces are only able to conduct all-out war of the atomic type, that limited wars must be handled exclusively by troops on the ground, cannot be upheld by the facts. Such a false representation of airpower capabilities insidiously undermines American strength by having us believe in and adopt methods of warfare which will give Communism an advantage.

Handicapped by the unrealistic restrictions placed on air operations during the Korean conflict, air forces nonetheless succeeded in being the crucial influence in that war. The true story of these air operations has been told by Gen. Otto P. Weyland, then Commander, Far Eastern Air Forces, in the *Air University Quarterly Review*.

(Continued on page 47)

AIRPOWER in LIMITED WAR

By Brig. Gen. Dale O. Smith

General Smith is one of our more regular authors. His last article for us was "Get Out of Town" in February '55, which dealt with civil defense. He's a member of the Operations Coordinating Board, Washington, D. C. For this article he drew on material from his forthcoming book, "U.S. Military Doctrine—A Study and Appraisal," which will be published May 17 by Little, Brown & Company, and Duell, Sloan & Pearce. The views expressed in this article are General Smith's own and should not be construed as reporting official or unofficial policies of the US Air Force.

Tactical A-bomb in Nevada. Failure to use new weapons returns warfare to the concept of multitudes.

"LOCAL defenses will always be important," Secretary of State John Foster Dulles has cautioned. "But there is no local defense which alone will contain the mighty land power of the Communist world. Local defenses must be reinforced by the further deterrent of massive retaliatory power."

The strategy of counter-attack loses its surprise value when directed at the strength of the aggressive attack. But when an aggressor nation is unable to foresee from which quarter a counter may materialize, it will probably be constrained from initiating an aggression in the first place. No nation is strong everywhere, and a counter-attack directed at vulnerabilities would be most unwelcome. It is this factor of uncertainty for the aggressor that can switch the initiative to the defender. We cannot let the potential aggressor, as Mr. Dulles also said, "prescribe battle conditions" that give him the advantage. If he is "glutted with manpower" it would be a course somewhat less than sensible to follow a strategy dependent upon manpower.

No celerity in our retaliation would be possible, however, if we were to place sole reliance on a devastating strategic attack. This would be but one method of retaliation, and hence an inflexible strategy. All-out strategic attack is likely to be the last method that would ever be used, and then only if our survival were gravely threatened. Hence the necessity for having lesser military forces designed to achieve limited objectives.

As Chairman of the Joint Chiefs of Staff, Adm. Arthur W. Radford, has said, "Our planning does not subscribe to the thinking that the ability to deliver massive atomic attack is, by itself, adequate to meet all our security needs." American salvation can be achieved by lesser means than total war, but for this to be possible it is absolutely mandatory that we have the capacity to gain swift victory in total war. Thus the major focus for our military policy must be related specifically to survival and hence this has become the "basic decision" of the National Security Council.

No decision ever made by our government in peacetime has faced a vital national defense problem so squarely. By adhering rigidly to moral principles, by carefully weighing the clear issues, and by taking full account of the military art, a policy was promulgated which is in harmony with advanced military doctrine. People, however, are eager for specifics. Just how can a limited threat be handled without plunging the world into atomic war?

With the development of atomic weapons, fire power can be packaged to provide almost any degree of force desired. From the .45 caliber shell of the pistol to the thermonuclear bomb which is equivalent to several megatons of TNT, a whole spectrum of weapons is appearing, each one yielding a different degree of fire power. No longer are hosts of men necessary to achieve concentrated fire power at any one place. Selection of the appropriate weapon for the task will permit the desired fire to be laid with relatively small military organizations as compared to the past. Arbitrarily restricting the use of nuclear weapons will obviously return warfare to the concept of multitudes and give a distinct advantage to that nation able to mobilize the greatest manpower. If, for example, the English at Agincourt had agreed not to use their deadly longbow because the French had not yet acquired knowledge of its employment, the French with their preponderance of numbers would have assuredly won the day.

The spectrum of weapons with varying explosive yields promotes military efficiency in any conceivable military task. The so-called tactical use of airpower, where the objective is to destroy a specific surface force, can be greatly enhanced by free selection of any weapon from the spectrum. There are, of course, certain world public opinion deterrents which must be overcome before nuclear weapons can be used, but these are not insuperable.

Even the tightly circumscribed air war fought in Korea opened new doors to the employment of air forces in wars where terms favorable to our side is our sole object. "The war to date," wrote Gen. Otto P. Weyland, "has repre-

(Continued on following page)

NEWS BULLETIN.. *Defence*

NEW 'TROUBLE SHOOTER' FLIES BETWEEN YOU AND ATOMIC ATTACK

The days when a war started with an official declaration are gone for ever. Very likely the first we shall hear about the next war will be the noise of an atom explosion or the news that an atomic attack has been repulsed.

In cold fact, the security of the free world now lies in the efficiency of radar networks and the speed of interceptor fighters. This is why news of a successful new type of all-weather day and night fighter is news that vitally concerns you.

The capabilities of the Gloster Javelin day and night fighter are a powerful deterrent against sneak 'knock-out' raids. The Javelin is a real 'pilots' plane – tough, compact and easy to handle. It carries a two man crew because of the complexity of its radar system which needs the attention of a full time expert. This big hard hitting fighter solves an acute defense problem and has already given a new look to Western Europe's role in the event of trouble.

Full details of this remarkable fighter are still secret. It is sufficient to say here that, from the word 'go', the Javelin can be up fighting at over 50,000 ft. in a very few minutes. And that refuelling and reloading are similarly a matter of minutes.

No other day and night all-weather fighter in service today has such speed or destructive firepower. No other all-weather fighter made anywhere has such development potential. The Javelin is made by Gloster, who made the first successful turbo-jet aircraft, (one of the remarkable Hawker Siddeley Group of companies also responsible for the Hawker Hunter fighter and the Avro Vulcan four-jet Delta-wing bomber).

GLOSTER AIRCRAFT CO. LIMITED

GLOUCESTER, ENGLAND

DAY AND NIGHT ALL WEATHER FIGHTER

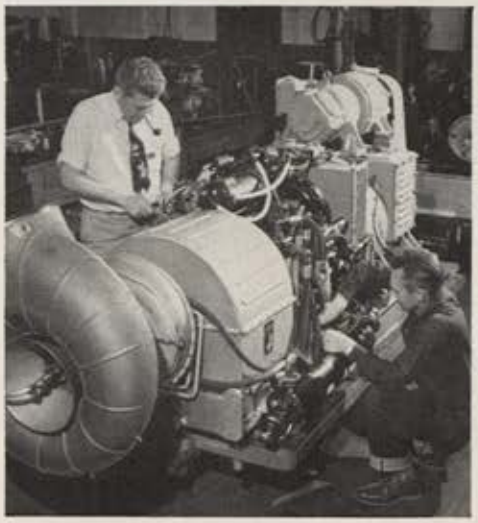
Gloster Javelin

Member of the Hawker Siddeley Group/Pioneer . . . and world leader in aviation

A Primer of Gas Turbine Engines

What is the man above holding?

He is holding a Solar "Mars" gas turbine engine. Its power output runs to 50 hp, but it weighs less than 100 lb and is smaller than a two-foot cube. It achieves this remarkable power-to-size ratio by running at a high speed: the shaft in this engine turns at 40,000 rpm!



Where are gas turbine engines being used?

Gas turbines today are finding an increasing variety of uses: in boats, where compactness is important; in airplanes, where light weight is essential; in remote pumping stations, where portability counts; in electric power plants, where reliability must be assured.

What gas turbines are made by Solar?

Today in addition to the 50 hp Mars gas turbine, Solar is producing the 500 hp Jupiter gas turbine (photo above). Its weight installed is under 900 lb—less than one fourth that of a comparable diesel engine!

Mars engines have been adapted to many applications such as fire pumps, starter carts, and welding equipment, and they are in volume production for auxiliary generator sets used on the Douglas C-124C and Lockheed C-121C. Both constant speed Jupiter engines for generator sets and variable speed engines for ship propulsion have been built for the U.S. Navy.

Solar gas turbine engines used in aviation are running up thousands of trouble-free hours. Write today for more data on these proven, reliable units!

ENGINEERS WANTED. *Unlimited opportunities in Solar's expanding gas turbine program! Write today, giving your experience, to the address in coupon below.*

What advantages do small gas turbines offer?

Gas turbines are extremely light and compact. They permit smaller space envelopes and easy transportation, so important in such applications as portable fire pumps and airborne generator sets (photo above). Gas turbines are simple and rugged, and can be started quickly and reliably. They need no cooling system and will operate on a variety of fuels.

SOLAR AIRCRAFT COMPANY — SAN DIEGO, DES MOINES

DESIGNERS, DEVELOPERS AND MANUFACTURERS OF METAL ALLOY PRODUCTS

This is What Solar Offers You

Solar specializes in the manufacture of precision products from alloys and special metals for severe service. Solar's experience since 1927 is unduplicated in this field. Solar skills and facilities range from research, design and development through to mass production. Wherever heat, corrosion or difficult specifications are problems, Solar can help you solve them.

PLANTS. *In San Diego (photo above) and Des Moines. A total of 1,400,000 sq ft of floor space. Approximately 5,000 employees. Annual sales over $65,000,000.*

EQUIPMENT. *Production equipment for all types of metal fabrication—forming, machining, welding, brazing, casting, coating. Extensive laboratory and testing equipment. Facilities for development, prototype, limited or mass production.*

SERVICES. *Research, design, development, tooling and production engineering staffs. Experienced with all alloy steels, stainless alloys, super alloys, and titanium and its alloys. Government source inspection and Solar quality control meet rigid aircraft and commercial standards.*

CONTRACT PRODUCTION

Current orders include aircraft engine and airframe parts, alloy castings, pneumatic ducting, atomic energy components. Customers include some of the most honored names among aircraft and industrial companies in the U.S. and Europe.

SPECIAL PRODUCTS

Bellows. *"Sola-Flex"® bellows and expansion joints in many designs from ½ in. up to the world's largest, 28 ft in diameter.*

Gas Turbines. *Solar "Mars" 50 hp engines for auxiliary generator sets, ground carts, portable fire pumps; Solar "Jupiter" 500 hp engines in variable and constant speed models.*

Ceramic Coatings. *"Solaramic"® is the Solar trade mark for a family of coatings that protects metals from heat, corrosion, galling and abrasion.*

Controls. *Complete control systems utilizing the new Solar "Microjet"® principle for control of gas turbines, jet engines and pneumatic devices.*

FURTHER INFORMATION
Your inquiry regarding any Solar product or service will receive prompt attention. Address
Solar Aircraft Company
Department B-10
San Diego 12, California

zine *The Aeroplane* commented: "The only people so far who have been able to get something like accurate results from wind-tunnel experiments are the workers at the experimental station at Langley Field, which is run by the National Advisory Committee for Aeronautics. . . ."

During the thirties, NACA continued its lead. The work it had done in the late twenties and early thirties in developing a low-drag cowl; in learning that the best position, aerodynamically, for engines was about mid-point on the leading edge of the wings; and in pointing up the large drag reductions to be had from use of retractable landing gear—such work was reflected in the Martin B-10 which has been called the first of our modern bombers.

More than a hundred wing sections or airfoils were developed during this period. The "two-thirty" series of wings were among the most successful, and became the most widely used wing sections in the world, appearing

An NACA engineer readies a dynamic model equipped with hydro-skis for a test run in the Towing Tank at Langley.

on military and commercial airplanes in the United States, and on commercial aircraft of foreign nations. In the years since, NACA has continued to develop improved wing sections providing improved performance in the transonic and supersonic speed ranges.

By the beginning of World War II, NACA had developed low-drag airfoils with laminar flow characteristics. In 1940, North American Aviation, Inc., was so favorably impressed with preliminary reports on the work that one of the new air foils, slightly modified, was incorporated in a new airplane which was to make a proud record over the battlefields of Europe, the P-51 Mustang. By the end of 1944, wings of the new airfoil family were in use on the Bell P-63 Kingcobra; the Douglas A-26 Invader, and the jet-propelled Lockheed P-80 Shooting Star and the Bell P-59 Airacomet.

During World War II, for the most part, NACA had to switch its program from fundamental research projects to specialized research on problems to bring about immediate improvement to military aircraft already designed. Fortunately, NACA's word had resulted in accumulation of a considerable backlog of technical information awaiting use. High-speed propellers, new devices for maintenance of stability and control, improved systems for cowling and cooling engines at high speeds, and advances in knowledge of structural elements—the results of basic research on fundamental aeronautical problems carried on for twenty years—all were available for ready use.

Working around the clock, seven days a week, NACA between December 1941 and December 1944, made design studies and tests of 115 types of airplanes. In this work NACA functioned in close collaboration with the technical branches of the military services, and with the engineering staffs of the aircraft and engine manufacturers. Month by month, the work-load increased until, in July 1944, NACA had seventy-eight different airplanes under simultaneous study.

As a result of work done in NACA facilities, the Curtiss P-40 Kittyhawk had its speed increased from 330 mph to 360, while another airplane had its performance boosted from 336 to 382 mph. The top speed of the Bell P-39 Airacobra was boosted from 340 mph to 392 mph.

During World War II, development of the turbojet and rocket engines for aeronautical use presaged an aeronautical revolution which found most dramatic expression in the supersonic research airplane conducted jointly by the Air Force, Navy, aircraft industry, and NACA—working as a team. The first supersonic flight was by an Air

(Continued on following page)

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(At presstime there was one vacancy on this committee)

Missile design problems are studied in the supersonic wind tunnel at NACA's Ames Laboratory in California.

Force plane, the Bell X-1, on October 14, 1947, and for this achievement, John Stack of NACA was co-winner of the Collier Trophy. In the citation he was credited with having conceived the program of the high-speed research airplanes. The two other co-winners were Lawrence D. Bell, president of the company that designed and built the X-1, and Maj. Charles E. Yeager, USAF, who flew the airplane. Since then, the speed frontiers have been further increased, with Scott Crossfield, one of NACA's aeronautical research scientists, being the first to exceed a Mach number of two, in the Douglas D-558-II. Yeager soon after, in December 1953, reached 1,650 mph in the Bell X-1A.

Since World War II, NACA has been pressing forward vigorously on two fronts: gaining the new aeronautical knowledge that will lead to development of aircraft and missiles of even higher performance; and providing the information, needed today, which can be used to exploit the performance possibilities of jet and rocket and other forms of power. Research facilities with a total cost of approximately $300,000,000 are used to carry on this important work.

Some examples of research accomplishment since World War II, examples which have been declassified, follow:

● Even before the end of World War II, the need for improved methods of protecting aircraft against the perils of icing had become apparent. By 1946 NACA had demonstrated the practicability of using heat for deicing, and for this achievement the Collier Trophy was awarded to the NACA's Lewis A. Rodert. The citation read: "For his pioneering research and guidance in the development and practical application of a thermal ice-prevention system for aircraft." Today, an increasing number of airplanes are equipped with thermal de-icing equipment.

● For nearly a decade NACA has been conducting basic research on problems involved in an airplane which can take off and land, vertically. The development of the turbojet and turboprop engine has made such an aircraft, with all the advantages which vertical rising provide, an object of great interest. The Lockheed XFV-1 and the Convair XFY-1 embody basic information, especially concerning stability and control, which NACA provided. So do other VTO aircraft under development.

NACA engineer at Lewis Laboratory, Ohio, studies shock waves of a thrust augmentation bleed-off turbojet engine.

● Beginning in 1945-46, scientists at NACA's Lewis Flight Propulsion Laboratory began fundamental pioneering work on the principle of after-burning. By burning additional quantities of fuel, aft of the turbine in a turbojet engine, power increases of as much as one hundred per cent are possible. The gains can be attained with only slight increases in weight of the engine. Today, many of the transonic and supersonic military aircraft utilize the afterburning principle.

● The all-movable tail, generally agreed among airplane designers as necessary to provide adequate control of an airplane flying at supersonic speeds. The poor control obtained with a conventional tail results from the decrease of control effectiveness of a hinged flap, combined with the increase in airplane stability at supersonic speeds. With a thin, all-movable tail, the decrease in control effectiveness is largely avoided. Such an all-movable tail was first suggested by NACA's R. T. Jones, about 1941. The first installation of a tail of this kind, incorporating a servotab suggested by R. R. Gilruth of NACA, was about 1943, and was on an XP-42. The all-movable tail has been used on the North American F-86 Sabre, and appears on most of the newer airplanes.

Other important, basic research, since World War II, has included such projects as a transonic compressor which makes possible turbojet development with higher inlet velocities and greater mass flow of the air, resulting in increased engine thrust; development of new wing sections which are more efficient at transonic and supersonic operation; determination of the most efficient inlet designs. This is especially important in the case of aircraft like the Republic RF-84F, where the nose of the airplane is packed with radar and photographic gear. Basic research in hydrodynamics has resulted in development of aircraft equipped with hydro-skis, fast aircraft capable of landing and taking off from water, sod, or snow. In hydrodynamics, also, research has led the way to development of flying boat hulls with a greatly increased length-beam ratio, resulting in higher performance.

Finally, in the words of Congressman Robert Wilson, Republican from California, one more example of the way NACA contributes to the development of our nation's military aircraft:

"In San Diego, California, the Convair Division of General Dynamics is building the F-102. The F-102 is a new Air Force interceptor airplane. It was designed to fly at supersonic speeds. On a given date, the F-102 design was necessarily frozen on the basis of the most current research information available in the country. Subsequent to the freezing of the design, new research information produced by NACA on the drag at transonic and supersonic speeds indicated the need for design changes if the required speeds were to be obtained.

"At about this same time a new design concept was evolved from NACA's basic research program which pointed the way to the solution of the drag problem on this airplane. A comprehensive series of tests was immediately undertaken by NACA using one transonic wind tunnel, three supersonic wind tunnels, and rocket-powered flying models. As a result of NACA's work, Convair was able to incorporate modifications into a production prototype.

"The F-102 has successfully flown at supersonic speeds approximately 100 mph in excess of the original design and at altitudes appreciably higher than the original design.

"NACA's work on this airplane is one of many examples of the vital nature of their work. Their efforts in large measure determine the quality and success of our military aircraft."—END

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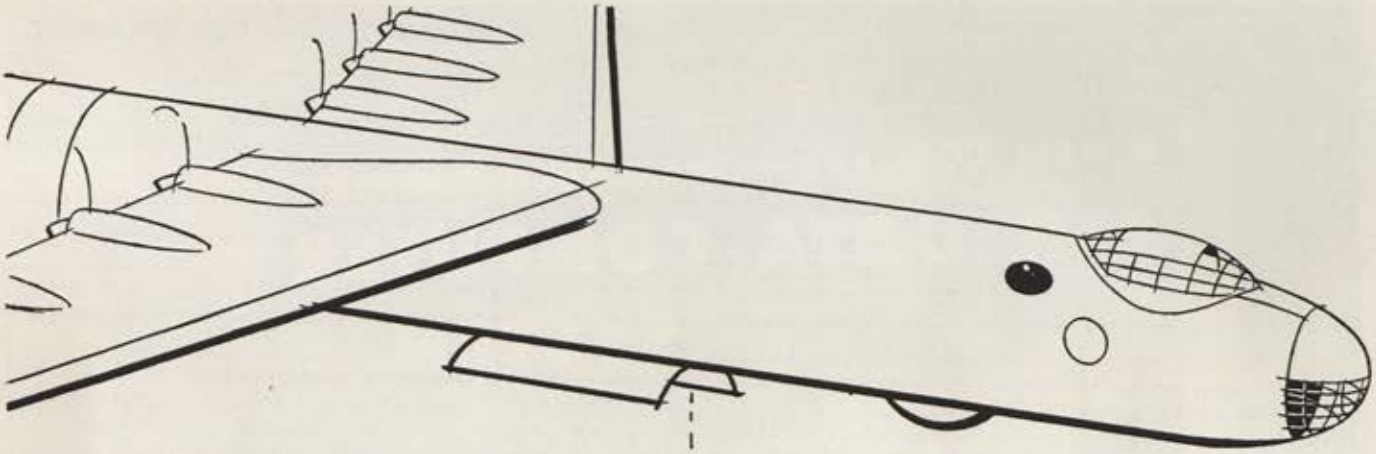

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MATS Flight Service

Helping Hand in the Sky

TO THE man on the street, the words "Flight Service" have no special meaning. But to thousands of United States military pilots, the 600 officers, airmen, and civilians who make up the organization are a bunch of angels. A support service of the Military Air Transport Service, with headquarters at Orlando AFB, Fla., Flight Service's mission is to make military flying safer in the US.

Strategically located throughout the nation, Flight Service's men keep an eye on all military flights twenty-four hours a day, seven days a week. If a plane is lost or fails to reach its destination in a reasonable period after the estimated time of arrival, FS men swing into action to find the plane. A pilot who becomes lost or is low on fuel simply radios the service By means of radio fixes, they can plot his position and direct him to the nearest airfield. In 1954 alone, the helping hands of Flight Service brought in a total of 334 lost airplanes to safe landings.—END

Airmen in a Flight Service office keep track of planes in their area.

A Flight Service officer and airman plot the position of a "lost" plane.

Operations section of the March AFB, Calif., Flight Service center. Messages are carried from one position to another by rotating belt above the table.

Tech Talk

By Lee Klein

A new flight-opening cargo door is being flight-tested on a Fairchild C-119.

The **effects of cosmic radiation** on mice (it turns their hair gray) and the comfort of air travelers (more women suffer motion sickness than men) were among subjects discussed at the Twenty-sixth Annual Meeting of the **Aero Medical Association** in Washington in March.

Medics and scientists from the military, industry, schools, and other nations gathered at the Statler Hotel and heard thirty-three papers and speeches during the three-day meeting.

Complex circuits of a new remote control system in an AF Lockheed QF-80C.

Some of the highlights:

• Recent tests indicate that a pilot can remain in a present-day jet fighter cockpit for **fifty-six hours** without suffering major physiological stress. At **Wright-Patterson AFB** four subjects were confined that long in F-84 cockpits and were tested under simulated flight conditions. Time was broken up into **three periods**—a period of **low performance,** followed by one of **high performance** and another of **low performance**—corresponding to the flight to target, action over target, and the long cruise back home. During low performance periods, subjects operated equipment only **fifteen minutes of every hour** and could sleep the rest of the time except for the three ten-minute emergency tests in both of these periods. During the high performance period of **nineteen hours,** the subject operated the test equipment continuously and had to remain **as alert as possible.** Chief complaint of the subjects—the uncomfortable oxygen mask. The men were enthusiastic about the "G (anti-gravity) suit," which can be used to massage legs and thighs, and the pneumatic cushion, which pulses to combat compression fatigue.

• In a **new ejection seat** for vertical take-off aircraft, the pilot's safety belt is opened as the seat rises on its rails, then the **seat is snubbed** momentarily when it is out of the cockpit. With the subject separated from the seat, the parachute is opened by a **static line.**

• An experimental **sealed cabin** of the type that would have to be used above 80,000 feet where pressurized cabins would not work, has been installed at the **USAF School of Aviation Medicine at Randolph AFB, Tex.** Sealed cabins would **carry their own air supply** and could not pump it from the outside. Air Force is trying to determine what types of climatic changes take place and how to cope with these changes when persons occupy the cabin.

• A study of **motion sickness** indicated that more persons become ill **during daylight** hours than at night, more become sick in two-engine than in four-engine planes, and **more women than men** are affected. Children are least susceptible. One interesting sidelight: There was a higher incidence of sickness for passengers seated by the left side windows than for those on the right. This was attributed to the fact that most turns and banks are made in that direction.

• In high-altitude (up to 95,000 feet) **balloon experiments** by the **USAF Aero Medical Field Laboratory,** black mice exposed to cosmic radiation showed a significant increase in **frequency of gray hairs.** Mice, rats, hamsters, rabbits, and monkeys were used in the tests. Except for the graying effect, the tests revealed no unexpected effects of primary cosmic radiation.

A **cargo door** that will **open in flight** has been installed in a **C-119 Flying Boxcar** and is undergoing flight tests at **Fairchild's Aircraft Division.** The doors were developed to answer the need for a system which could be opened and closed in flight and would **not have to be removed** for paradrops. The bottom section of the system can be retracted into the top section to provide an opening, or the entire end of the fuselage can be raised (see cut) to drop heavy equipment. The flight-operable doors are **operated hydraulically** from either the pilot, co-pilot, or cargo compartment positions. Fairchild plans to install the doors on more than 100 Boxcars.

One of the features of a new **remote control system** for jet fighter aircraft is an **electronic "brain"** that takes over if the control signals should be interrupted

(Continued on page 104)

Grumman S2F carries radar and a magnetic boom for detecting submerged subs.

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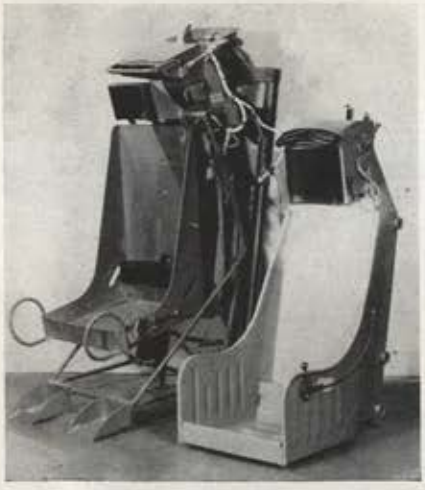
It was quite a month for EJECTION SEATS

Great Britain, the Air Force, and the Navy report new developments

A life-size dummy is ejected at ground level at speed of 130 mph.

A few seconds later, the parachute canopy has opened and the dummy—now out of the seat—floats down.



Present F7U-3 seat (left) weighs 130 lbs. New one weighs only thirty lbs.

or shut off. In the event of a **signal failure,** the brain would put the plane into an orbit at a safe altitude. For instance, if the plane is below a preselected altitude when "carrier" signals are shut off, the brain puts the plane into a **full-power, seven-degree climb,** retracts dive flaps if these were extended, and goes into a climbing left turn at 200 mph until the proper altitude is reached. Then it goes into a **left turn level orbit** at 265 mph until the signal is restored.

Developed by **Sperry Gyroscope Co.** and the **ARDC,** the new UHF (ultra-high frequency) system provides **automatic take-offs** and landings with **split-second control** by radio and radar at all times. Guidance supplied from either ground "beeper" stations or from accompanying "director" aircraft is said to be **more precise** than older systems. The new system has been designed as a standardized production version.

It was quite a month for **ejection seats.** Three variations in the art of ejection came from the British, the Air Force and the Navy.

Last September, we reported in this department that England's **Martin-Baker Co.** had developed a new ejection seat that would enable a pilot to escape from a crippled airplane at altitudes **as low as fifty feet.** From the looks of tests now being conducted, it appears that first reports of the gear were not optimistic enough. The company has tested the equipment **on the ground** using a life-size dummy, ejected from the rear seat at a pre-take-off speed of 130 mph (see cut). The new system has a **split-second timing** device that releases the seat and opens the parachute automatically.

A new, **simplified ejection seat** has been developed for the Air Force by **Republic Aviation Corporation.** Ejection with the new seat requires **only two operations,** lifting the leg braces and squeezing a hand-grip trigger. **Lifting the leg brace** raises the arm rests, locks the shoulder harness, jettisons the canopy, arms the catapult trigger, and performs other pre-ejection functions. Then a **squeeze on the trigger** ejects the seat, disconnects oxygen and electrical connections, and sets a delay device. This **delay releases the seat** from the pilot at the height of its arc.

For the Navy, **Chance Vought Aircraft, Inc.,** announced a simplified **thirty-pound-seat** that cuts 100 pounds off the weight of previous seats. It **eliminates many features** once considered essential, but which jump experiences have proved superfluous, according to Chance Vought. Eliminated were the leg braces and foot stirrups and the parachute to stabilize seats in the air. There is **no pre-ejection handle.** To eject, the pilot pulls the face curtain downward. This locks his harness and automatically jettisons the canopy during the first part of the travel and then fires the seat. When the seat reaches the end of the ejection rails, an automatic system releases the lap and shoulder harness. The pilot also has a manual release.

During the Korean war, we donated **thousands of pounds of aluminum alloy** to the Communist stockpile in the form of **wing-tanks** dropped over their lines. For this reason, and because aluminum becomes a **scarce metal** during a war, **plastic droppable fuel tanks** have been developed and are now in production by **Molded Products Corp.,** a **Division of Admiral Corp.** The tanks, being produced for the Air Force, are **heavier** (115 pounds for a 225-gallon tank as opposed to ninety-nine pounds) than the aluminum

An altitude of 9,565 is shown on Kollsman's new altimeter. Two digit counter registers thousands of feet.

ones, but engineers believe that they will be able to bring this weight down.

Latest in the trend toward **simplifying controls** and instruments in cockpits is a new **counter altimeter** developed by the **Kollsman Instrument Corp.** A two-digit counter in the center of the dial shows the altitude in thousands of feet while a large pointer makes one revolution for every thousand feet on a dial graduated at fifty-foot intervals (see cut). Most pilots will agree that it is a **vast improvement** over the old altimeter with its three pointers.

The recent announcement by the **Defense Department** and the **Atomic Energy Commission** regarding **atomic anti-aircraft weapons** reminded us of an AIR FORCE article of almost three years ago (see "A-Bombs for Air Defense," July '52). At that time we reported that a revolutionary **new air defense system** utilizing nuclear weapons was being considered at the highest policy levels. Evidence that the **concept has progressed** further than the planning stage was clear when it was revealed that a nuclear device would be fired miles high over the Nevada proving ground. Observers recalled that during the March tests in Nevada, a non-atomic blast was set off **in the midst of a smoke grid** laid out by planes flying so high they could not be seen. It was presumed that a similar grid would be used in the atomic test and the **effect of the blast** on the smoke trails compared with the smaller explosion. Some experts believe that a shock wave set off by an atomic explosion—even at extreme altitudes where these waves dissipate faster—would be **strong enough to knock** a formation of enemy airplanes **out of the sky.**—END

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U.S. AIR FORCE

'General Baker Day' in New Jersey

AFA UNITS JOIN JAYCEES IN HONORING AN AMC OFFICER TO HELP OUT AF RECRUITING

On February 12, the state of **New Jersey** paid tribute to a native son, Air Force **Maj. Gen. David H. Baker,** head of the Directorate of Procurement and Production for the Air Materiel Command, Wright-Patterson AFB, Ohio. Baker hails from Paterson, N. J. State **Governor Robert D. Meyner** proclaimed his support of "David H. Baker Day," while the **Mayor of Paterson** issued a similar proclamation. A luncheon at the Alexander Hamilton Hotel brought together **more than 600** friends and admirers of General Baker's Air Force career.

The affair was sponsored by the **Junior Chamber of Commerce** as part of its nation-wide promotion of **"Operation Top Flight,"** a program designed to help **Air Force recruiting** through airpower education. **Edward P. Schinman,** President of Bogue Electric Manufacturing Company, was general chairman. Co-sponsors with the Junior Chamber were the **New Jersey Wing of AFA** as well as AFA's **Passaic-Bergen Squadron** and several **AFA Industrial Associates.**

AFA Director **John Currie** was general vice chairman and headed the hard-working committees, one of which, publicity, was led by **Haig Kafafian,** who is "Top Flight" chairman for the Paterson Jay-Cees.

Brig. Gen. Arno H. Luehman, Commander of the 3500th USAF Recruiting Wing, was honorary chairman. He expressed his gratitude to the sponsors for bringing the important airpower message to the state. As a result of the program, at least fifty men were recruited for the Air Force in the three-week period immediately following.

Among the **honored guests** were Roy T. Hurley, President, Curtiss-Wright Corp.; Michael Stroukoff, President, Stroukoff Aviation Corp.; Sen. Clifford P. Case; Rep. Gordon C. Canfield; Maj. Gen. Lyman P. Whitten; Brig. Gen. Chester A. Charles; Mrs. Blanche Scott; and Capt. Robert B. Twining (USN, Ret.), brother of USAF Chief of Staff Gen. Nathan F. Twining.

Billed as **"youth education,"** but actually more of a general aviation education program, a project of the **Queens, N. Y., Squadron** is rolling along in high gear. The unit, which received an Exceptional Service award at AFA's 1954 National Convention, has enlarged the scope of its activities this year and is engaged in **Civil Defense work.**

Members of **Air Explorer Scout Troop #257,** sponsored by the Squadron, make calls in their neighborhoods looking for prospects for the **Ground Observer Corps.** Acting on the results of this canvass, Squadron members then follow up the visits and enlist GOC "spotters" and other Civil Defense workers. In order that they might be better able to put across the program, the Scouts have been taken on tours of Filter Centers and Observation Posts.

In February, the Troop and members of the Squadron took an **orientation flight** over Manhattan in an **American Airlines** Flagship. Later, a similar trip is scheduled in one of **Trans World Airlines** new "Super G" Constellations. **National Airlines** has also helped out the Squadron's educational program. On one occasion, the air line held up an engine overhaul and did the work at night, so the members could see how the job was done.

Organizational efforts of many individuals and groups have paid off dividends in the last month in the form of **four new squadrons.**

California now boasts fifteen active Squadrons, with the latest addition the **Air Harbor Squadron** in **Hawthorne.** Santa Monica members formed the nucleus of the original organization committee. **James F. Czach** was elected Commander of Air Harbor. Other officers are Carl Brinke, Al Bazis, William Dorsett, Warren Sparks, Thomas Dardis, Lee Matthews, Duane Cooper, and M. W. Hooper.

At the other side of the nation, **Bangor, Maine,** received a Charter for its new Squadron. **Martin Cantor,** 58 Jefferson St., Bangor, was the sparkplug in the original activity, and was elected first Commander. His officers are Dennis Lombardi, William Wells, Fred Hill, Neil Sawyer, John Geagan, George Warren, and Paul Riley. An immediate aim is a membership drive at nearby Dow AFB.

Some thirty members gathered in **Cincinnati** on March 15 and applied for a Squadron Charter there. **Dean S. Rood,** who recently moved from Akron to Cincinnati, was named new Commander. He was also partially responsible for the reactivation of the Akron Squadron. Clay Hill, Joseph Grabsch, Paul Schwartz, Ber-

(Continued on following page)

SQUADRON OF THE MONTH

The Passaic-Bergen, N. J., Squadron

CITED FOR

co-sponsoring a highly successful program that not only paid tribute to a local dignitary but also increased interest in the mission of the USAF and developed better public understanding of that mission.

Alan Cross, Miami Squadron Commander, crowns Miss Judy Brown Aerorama Queen during a recent aviation festival.

Maj. Gen. David H. Baker accepts plaque from Edward Schinman, general chairman of Baker Day program.

Speaker's table at recent observance of Baker Day in Paterson, N. J., when 600 attended luncheon honoring Maj. Gen. David H. Baker, who is seated in center of picture. AFA and Junior Chamber of Commerce sponsored program.

Officers of Santa Monica Squadron accept Air Explorer Charter. From left, Tom Gregory, Lester Vetter, Jim Czach, who is the Squadron Commander, Harold Barlow, Percy Woodford, Howard Crookes, and an unidentified Scouter.

nard Bockman, Alvin Nurre, James van Ribber, and Arthur Osmond are officers.

Oklahoma City has also received a Charter for a new Squadron. **Mace Spangler,** Principal of Northeast High School, is Commander. Officers are Grey Wyman, James Bankhead, Maj. Gen. Fred Borum (USAF, Ret.), Hardin Masters, and Doyle Haspie. Masters was head of the organization committee, and headed the committee which planned the charter dinner. **Maj. Gen. William O. Senter,** Commander of nearby Tinker AFB, spoke to the group on Air Force-AFA partnership.

Another in the fine series of programs sponsored by the **New York Wing,** and supported by the combined membership of all Greater New York Squadrons, was held in March. **Col. Bernard Rose,** Commander of the New York Air Reserve Center, spoke on the Reserve program. **Wing Commander David Levison,** presided and introduced the guests, among them Bob Johnson, past AFA President; and former Brig. Gen. Robert Condon.

Before the meeting the Council discussed the "**incentive**" **plan** recently approved by the Wing. A perpetual trophy has been obtained and will be awarded to the Reserve Wing within the 1st Air Force judged best in recruiting. **Maj. Gen. Roger J. Browne,** 1st AF Commander, has appointed a board of officers to review all training and recruiting activities, and it will select the unit to receive the New York Wing's award.

At the same time as the formation of the new Air Harbor Squadron in **Hawthorne, Calif.,** an **Auxiliary Unit** was also organized there. Sixteen members signed the charter application, which was approved on March 24. **Mrs. Grace Brinke** is President. Other officers are Helen Bazis, Vivian Hooper, Jeanne Czach, Jane Dorsett, Helen Henderson, Billie Farson, and Mary Cooper.

Another new California Auxiliary Unit

(Continued on page 111)

Advisors and three members of Penn State University "Angel Flight" inspect a J-33 turbojet engine. Jo Groesbeck, Nittany Squadron Commander, and Mrs. Daniel Riva, who are both Flight advisors, are second and third from left.

Another turboprop first by Aeroproducts!

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Aeroproducts turbopropellers made flight history again February 24 when they helped power the Navy's giant R3Y Tradewind on the first cross-country hop of a turboprop seaplane. The 80-ton Tradewind flew non-stop from San Diego, California, to Patuxent River, Maryland, in six hours.

A cargo transport, the R3Y sets the trend toward wide use of turboprop engines and turbopropellers. This pioneering flight also marks another first for Aeroproducts. In 1945, an Aeroproducts turbopropeller was used on a Convair F-81 in the first flight of a turboprop-powered plane in the United States. In fact, Aeroproducts turbopropellers have more flight time than any other American-made turbopropellers.

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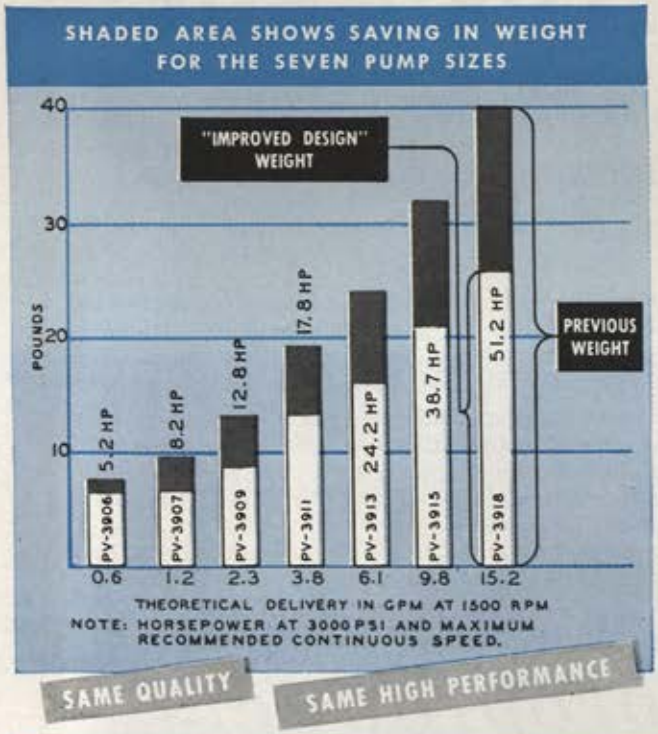

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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

is also being formed by the **Northbay Squadron.** Details will be announced later.

The National Auxiliary **Board of Governors** met in Los Angeles in March to discuss several major items of importance, among them plans for the 1955 National Convention. A new revised **national Auxiliary constitution** was approved, and several national programs adopted.

Mrs. Nancy Scherer, National Auxiliary President, presided at the meeting which brought together seventeen Auxiliary Governors and guests, among them AFA President **John R. Alison,** who reported to the ladies on the latest AFA Board of Directors meeting.

AFA's **Nittany Squadron,** University Park, Penna., has assisted in the formation of an Angel Flight to supplement the **Arnold Air Society Squadron** at Penn State University in that city. The idea for this program originated with a visit to the campus of Omaha University, where the first Angel Flight was organized. The Angels are coeds chosen for their appearance, personality, and interest in Air Force activities. They assist in the promotion of Arnold Air Society programs, and in most instances have uniformed drill teams which march in official AAS Squadron activities.

At Penn State, **fifty-five girls** are in the Flight. Advisors are Miss Josephine Groesbeck, AFA Squadron Commander, and Mrs. Daniel Riva, wife of the Professor of Air Science.

The April issue of "AFA News" erroneously said that the Air Explorer Scout Troop sponsored by the **Santa Monica Squadron** was the first such unit in California. The first actually was the **Pasadena Squadron's Troop #51,** now in its third year.

CROSS COUNTRY . . . Commander **Fred Goulston** of the **Ohio Wing** presided at a meeting of the Ohio Executive Committee in Akron recently. All four officers from the Wing and the Commanders of all active Squadrons attended . . . **Fran Dolin,** California Deputy Wing CO, is bragging about **his daughter Sheron,** who was recently named Captain of the Rangerettes, precision riding troupe . . . **Fresno Squadron's S. S. Boghosian** is also proud of his brother Sam, who recently was awarded **AFA's Silver Medal** at UCLA . . . Model planes constructed by boys at the **McKinley Home, Van Nuys, Calif.,** will be flown in a meet this month. Judging will be done by members of the **San Fernando Squadron,** which donated the kits to the boys at Christmas-time . . . **Col. Francis Gabreski,** former AFA Wing Commander, who's now stationed at Maxwell AFB, will address the organizational meeting of the **Mobile, Ala., Squadron** . . . A novel approach to the officer-installation idea was successfully tried **in Chicago** in March, when the officers of all area Squadrons were installed on the same night at a dinner meeting at **O'Hare AFB Officers Club.**—END


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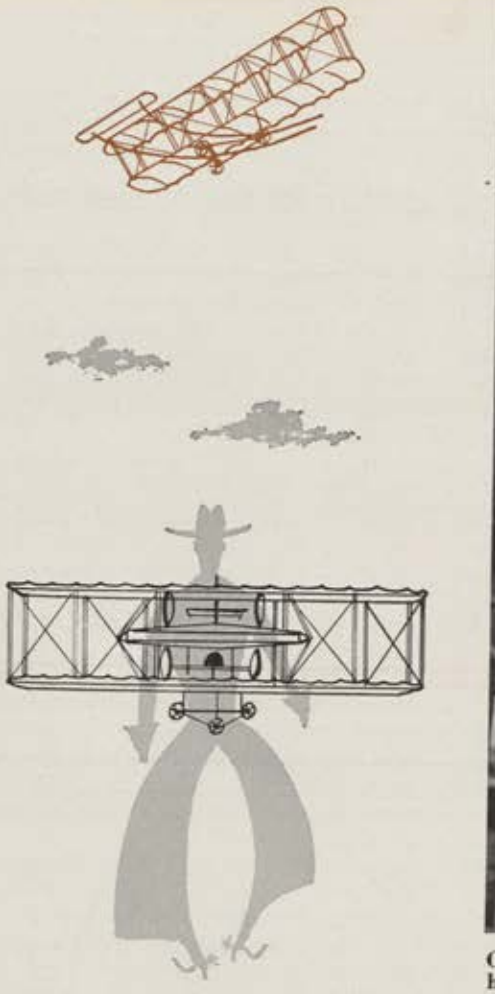

Colonel Sam Cody at the controls of his famous "Cathedral" biplane in which he gained the principal award in the British military air trials of 1912.

England's Flying Cowboy

How a rough and ready showman from Texas opened British eyes to the coming age of aviation

By Samuel S. Whitt

A WILD and woolly, fancy-shooting cowboy from Texas was the first man to fly from British soil. He built Britain's first military airplane and became England's first test pilot. The cowpoke's name was Samuel Franklin Cody.

Sam Cody was born in what is now part of Fort Worth, in 1861. Like Buffalo Bill Cody, he was a cowpuncher, an Indian fighter, and a Wild West showman.

Though not related to Bill Cody, Sam affected the same flowing hair, goatee, and ten-gallon hat.

After touring the United States with a Wild West show, Sam Cody—billed as "King of the Cowboys"—amazed Europe with his fancy shooting and daredevil horsemanship. His wife, Leila Marie, was a Texas sharpshooter and rider he'd met with the Wild West show. Their three little boys—Vivian, Frank, and Leon—were troupers of the first order. Their hectic road-show life turned out to be a real proving ground for future hardships when Cody became airminded.

It was in London in 1901 that Cody began his first experiments with man-lifting kites on the grounds of the huge Crystal Palace, center for early British aeronautical activities. All the Cody family shared the risks. The boys made many flights, and Mrs. Cody went aloft as early as 1901.

Cody's experiments included a voyage from Calais to Dover in a small boat towed by his kite. The British government became interested and asked for a demonstration before Admiralty and War Office officials.

The ponderous wheels of British officialdom ground into motion. Memoranda between the War Office and the Admiralty piled up to dimensions that no Cody war kite could ever take aloft. Finally, after two years, Cody signed a three-year civilian contract as "Chief Instructor in Kiting" at the Royal Balloon Factory at Farnborough.

In 1906, when Cody joined the staff, the Royal Balloon Factory had already accumulated sixteen years of experience in military ballooning and was destined to become the Royal Aircraft Establishment, the present-day "Wright Field" of the RAF. Shortly after Cody reported for duty, a Colonel Capper became superintendent. Capper had visited the Wright Brothers in America and was enthusiastic about heavier-than-air machines.

Soon after Cody arrived, Colonel Capper asked War Office permission for his new employee to convert a kite into a flying machine. This was refused, so as an alternative, Cody was given the job of building and flying a dirigible.

The factory already had a dirigible, the two-year-old *Nulli Secundus*

(Continued on following page)

("Second to None"), but it had never flown. With this for a starter, Cody went to work on the design, suspension, and layout of the car, and most important, the power plant—a fifty-horsepower Antoinette gasoline engine. By herculean efforts plus mechanical genius and pure necromancy, Cody coaxed the cantankerous engine to run satisfactorily for *Nulli's* first flight, in September 1907. On this flight he successfully navigated over Farnborough, but bent a structural member in a turn near the ground.

Within a month, with Cody at the controls and Capper as passenger, the repaired *Nulli* set a world's record for dirigibles—three-and-one-half hours aloft. This flight was not a tame test maneuver over Farnborough commons. Cody drove her straight to London, circled Buckingham Palace, the War Office (stronghold of reactionary resistance to aeronautical progress), and St. Paul's Cathedral at 750 feet. The Antoinette motor never faltered, and all London seethed with wonder. But when it was time to go home, a strong headwind sprang up and it became evident that the fuel would not last to Farnborough.

They decided to land on the Crystal Palace grounds, and Cody turned back to negotiate the tricky landing. Once again his practical genius asserted itself. He had mounted a large klaxon horn in the car for just such an emergency. As they neared the ground, Cody kept the horn going full blast, and a large crew assembled to man the mooring cables for a safe landing.

After a three-day wait for the wind to die down, the crew deflated *Nulli* and returned her to Farnborough by wagon. She never flew again. But despite her short career *Nulli* paid for herself many times over by stimulating increased appropriations for the Balloon Factory and awakening the British public to the possibilities of aerial navigation.

The dirigible had scarcely returned to Farnborough before Cody was hard at work on a heavier-than-air flying machine, thriftily utilizing *Nulli's* engine. For the next year he worked like a madman, making new parts himself when they could not be purchased, testing controls, improvising where necessary (the pilot's seat consisted of a discarded metal plow seat), and never once losing faith that his contraption would fly.

At last he began flying tests. Cody's plane was a monster compared to the smaller Wright Flyer, and had more than double the horsepower of the Wright machine. He made a few taxi runs across the rough stubbled field, then gingerly lifted the craft into the air. October 5, 1908, marked the first flight of a heavier-than-air machine from British soil. On the last of several short flights, Cody turned to avoid some trees. A wingtip hit the ground, the plane cracked up, but fortunately Cody was not seriously hurt.

At an Aeronautical Society meeting, Cody gave this account of the adventure: "I have accomplished one thing I'd hoped for very much, that is to be the first man to fly in Great Britain. . . . I made some five flights in all, and the last flight came to grief. . . . I think that I flew at about twenty-eight miles per hour. I had fifty horsepower in the engine. . . . That side of the machine struck, and it crumpled up like so much tissue paper, and the wing spun round and struck the ground, and the framework was considerably wrecked."

Cody repaired his flying machine and made another try about three months later. Once again the plane was wrecked, but not badly. Back it went to the repair shop, and the next month, on February 22, 1909, Cody flew 400 yards, negotiated a successful ninety-degree turn and landed safely. Within three months he succeeded in flying a mile. This latter flight aroused so much interest that the Prince of Wales (later King George V), who was at nearby Aldershot, hurried over for a repeat performance. Unfortunately for the momentous occasion, Cody had to turn shortly after take-off to avoid some troops and mushed into an embankment, demolishing the tail.

When the plane had been put together again, he began making longer flights, and on July 21 he flew four miles. On that occasion he buzzed the Farnborough Hotel, railroad station, and other places nearby, causing so much excitement that a London paper sent a reporter for an interview.

Within the month Colonel Cody carried his first two passengers, Colonel Capper and Mrs. Cody, the latter being the first woman to fly from British soil.

On September 5, 1909, Cody flew more than forty miles in an hour and three minutes—then a world's record for cross-country flight. The next day he carried five passengers on local flights. For these outstanding achievements the Aeronautical Society awarded him its Silver Medal.

In the midst of these successes, the War Office decided Cody's experiments cost too much. His contract was not renewed. The War Office gave Cody the plane, less engine, after pronouncing it "useless to the Military Service."

But this didn't stop Cody. He simply built a shed on Laffan's Plain, near the Farnborough Balloon Factory, hired an assistant and went to work at his own expense.

When he started to work for the War Office, Colonel Cody quit his Wild West shows, but he didn't stop acting. More often than not, he appeared at the kiting exercises on horseback, toting pistols and wearing a ten-gallon hat. A frequent "extemporaneous" exhibition was shooting toy balloons from the sky while galloping on a horse at breakneck speed. Such pranks delighted the reporters of Fleet Street. But this exuberant disregard for dignity probably delayed recognition of Cody's more solid achievements by such organizations as the Royal Aero Club, which did not accept him as a member until 1909, and the Aeronautical Society, which he joined in 1903. More important, his irrepressible flair for showmanship may have played a part in the War Office's failure to renew his contract.

At the new workshop successes and failures came in rapid succession. He fitted the old airframe with a sixty-horsepower Green engine, and improved the flight control mechanism. The airplane had a wheel control for elevators, rudder, and wing warping. A foot pedal operated the throttle. This plane, the largest of its day, weighed more than a ton, twice the weight of the Wright machine. It had two two-bladed pusher propellers rotating in opposite directions at 600 revolutions per minute. They drove the craft at a speed of thirty-seven miles per hour. Wingspread was fifty-

(Continued on page 117)

About the Author

Samuel S. Whitt has been an Air Force Intelligence Specialist since early in World War II, and assigned to Hq., USAF for nearly ten years. In WW II he was a Combat Air Intelligence officer with the 7th Bomb Group and later served in the C-B-I theater. His hobbies include flying and research in early aviation, as amply demonstrated in this article. He's married and is the father of four children.

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two feet, with a total wing area of 780 square feet. By his own admission, Cody liked large airplanes, the bigger the better.

In the fall of 1909 Colonel Cody agreed to fly in Britain's first aerial display at the Doncaster race course. He was to receive 2,000 pounds and was paid 500 pounds in advance. But the Royal Aero Club refused to sanction the meet. That august body had to approve all applications for participation in aerial meets and competitive flights. If Cody went through with his bargain, he might automatically be barred from future events. A serious issue, for his future income largely depended on these activities. Nevertheless, the Texan had contracted to fly and fly he did.

As it turned out, on his first take-off he went into a spin and crashed. He wasn't hurt, but his plane was a total wreck. His participation had been so brief that the Royal Aero Club did not bar him from future competition.

It was at this meet, wearing a rig that was a cross between an English sportsman and a Texas cowboy, that he used the back of the town clerk as a desk to sign British naturalization papers.

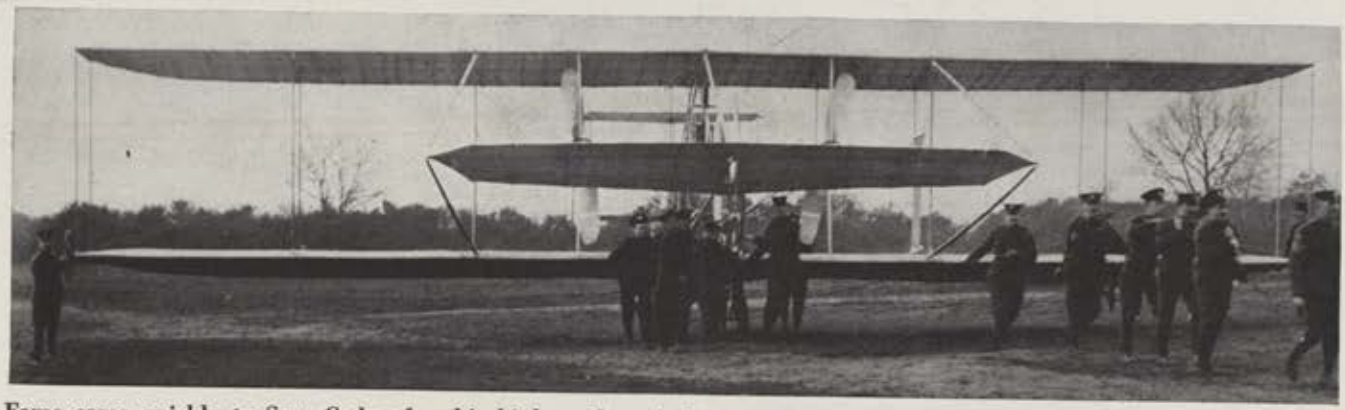
In 1910 Cody flew in many important meets, winding up the year on December 31 by capturing the famous Michelin Cup and its 600 pounds for flying the furthest distance non-stop. In 1911 Cody flew in a race which he did not win, but which won him ovations from the British people and personal congratulations from King George V. It was the *Daily Mail* contest which offered 10,000 pounds to the winner in a race around the British Isles. The length of the course, from Brooklands up the east coast to Edinburgh, across to Glasgow, around the coast to Manchester, Bristol, and Brighton, and back to Brooklands, was 1,010 miles. Nineteen aviators started. Four finished. The winner was a Frenchman, Beaumont, flying a Bleriot monoplane. Cody finished last but whereas the winner had a large staff and ample financial backing, Cody's only help came from his son, who acted as mechanic. Within the same month he flew 125 miles in three hours, six and one-half minutes, to win another Michelin trophy for speed. And then he won still another Michelin prize for the longest sustained flight.

In 1912 the British government opened a competition for the best all-around military airplane to inventors of any country caring to compete. Twenty British, one Austrian, one German, and ten French planes entered the trials which were held at Salisbury Plain not far from Stonehenge.

Each airplane had to carry 350 pounds in addition to fuel for four and one-half hours, fly nonstop for three hours reaching a height of 4,500 feet, and fly one hour at 1,500 feet. It had to climb 1,000 feet at not less than 200 feet a minute. Speed had to be not less than fifty-five mph, and its pilot was required to shut off his engine at 1,000 feet and glide 6,000 feet before alighting. It had to demonstrate its ability to rise from long grass, clover, or harrowed land, and land without damage in a plowed field. It was also required to pull up after a normal landing within seventy-five yards of the point where it touched the ground. The planes had to be fitted in packing cases—unpacking and assembly to be made under official observation against time.

Cody entered his famous "Cathedral" biplane, a refinement of his original machine. A newspaper reporter had christened the plane when he overheard Cody explaining that the upper wing had cat-hedral (opposite of dihedral) and assumed that Cody called the plane "Cathedral" because of its tremendous size. The Cathedral weighed more than one and one-half tons and was powered by a 120-hp Austro-Daimler engine—by far the largest plane of any of the competing models.

Cody's victory was spectacular, far surpassing his nearest competitor. He climbed at 280 feet a minute, flew at a top speed of 72.4 mph, and a slow speed of 48.5 mph. In the pulling-up tests he came to a standstill in fifty-six yards after alighting—thanks to an ingenious braking device consisting of a length of chain looped over the landing skid and made to slide down the skid and bite into the ground at the right moment.



Fame came quickly to Sam Cody after his biplane, here being towed into position, won the British military air trials.

As a colorful aviator, Cody's fame had already been won. The military trials victory assured his reputation as an engineer and technician. The Royal Aero Club awarded him its highest honor, the Gold Medal, and he became an Associate Fellow of the Aeronautical Society. His prize money totaled 5,000 pounds. His Majesty's government purchased his machine, and the "Cathedral" became the first military airplane of the Imperial Forces.

This same year the British government settled litigation over war kite patents, awarding him 4,000 pounds. With a tidy sum at his disposal, Cody promptly formed the Cody & Sons Aerial Navigation Co., Ltd., and began work on a huge biplane that would fly the Atlantic.

When the *Daily Mail* offered another prize of 10,000 pounds to the first man to circle Great Britain in a water-based plane, Cody entered his sixth, and last, aircraft. Powered with a 100-hp "Green" engine, the wings covered with Irish linen, it was designed as a seaplane. For the flight tests, however, he installed landing

(Continued on following page)

skids. During these tests King George V visited him, showing great interest in the plane and—very important to Cody—addressed him as "Colonel." Cody's self-arrogated title was now official.

On August 7, 1913, two aviation enthusiasts, a Mr. Evans, a young diplomat on leave, and his friend, a Mr. Kayser, motored over to ride in Colonel Cody's flying machine. They drew straws for the first ride. Kayser won and was treated to a series of shallow dives and climbs which Cody called "steeple-chasing." When they had landed, Evans took his seat behind the pilot. After an eight-minute flight the wings buckled at 200 feet, and both passengers catapulted to the ground. Death was instantaneous. Cody was fifty-one.

Public sorrow was nationwide. Important personages sent condolences and the King instructed his Chief of the Imperial General Staff, Field Marshal Haig, to "convey to Mrs. Cody and her sons my sincere sympathy with them in their sorrows. . . ."

An estimated 100,000 mourners lined the two and one-half mile route from Cody's home to the Aldershot military cemetery to pay their last respects. The newly formed Royal Flying Corps sent every available member and representatives from every unit of Aldershot Station were there. The road was filled with the mile-long procession headed by pipers of the "Black Watch."

At his death Cody was practically penniless. All his earnings had gone into experiments. A memorial fund accepted contributions to support his widow, and the Aerial League held a memorial day at the London Hippodrome. Proposals were made in Parliament for a pension for Mrs. Cody, and later funds were approved for a memorial.

Cody left his own memorial. His sons continued to work for the Balloon Factory and its successor, the Royal Aircraft Establishment at Farnborough. In World War I, Frank Cody joined the Royal Flying Corps and gave his life for his country. By the end of World War II, Leon Cody and his son were still at Farnborough.

Near the Operations Building there's a tree, gnarled and scrawny now, which bears a bronze plaque asserting that Cody used to tether his airplanes there. During the war many Americans saw this memorial, and reflective souls must have pondered that our greatest contribution to our mother country's Air Force may well have been this Texas cowboy whose spirit is yet alive in the RAF.—END

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