



AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

February 1956 • 35c

The Race for The Intercontinental BALLISTIC MISSILE

ALSO IN THIS ISSUE:

Sweden—NATO's Missing Link

A Look at the New Air Force Budget



CHANCE VOUGHT'S F8U-1 *Crusader*, newest supersonic Navy fighter, depends on Hamilton Standard air conditioning systems, fuel controls, and other vital equipment. Currently in use on 40 different turbine-powered military aircraft, Hamilton Standard products play an important role in achieving more efficient aircraft and power plant performance. For superlative engineering, years of production experience, outstanding facilities for research and development, aviation in the jet age continues to rely on Hamilton Standard.

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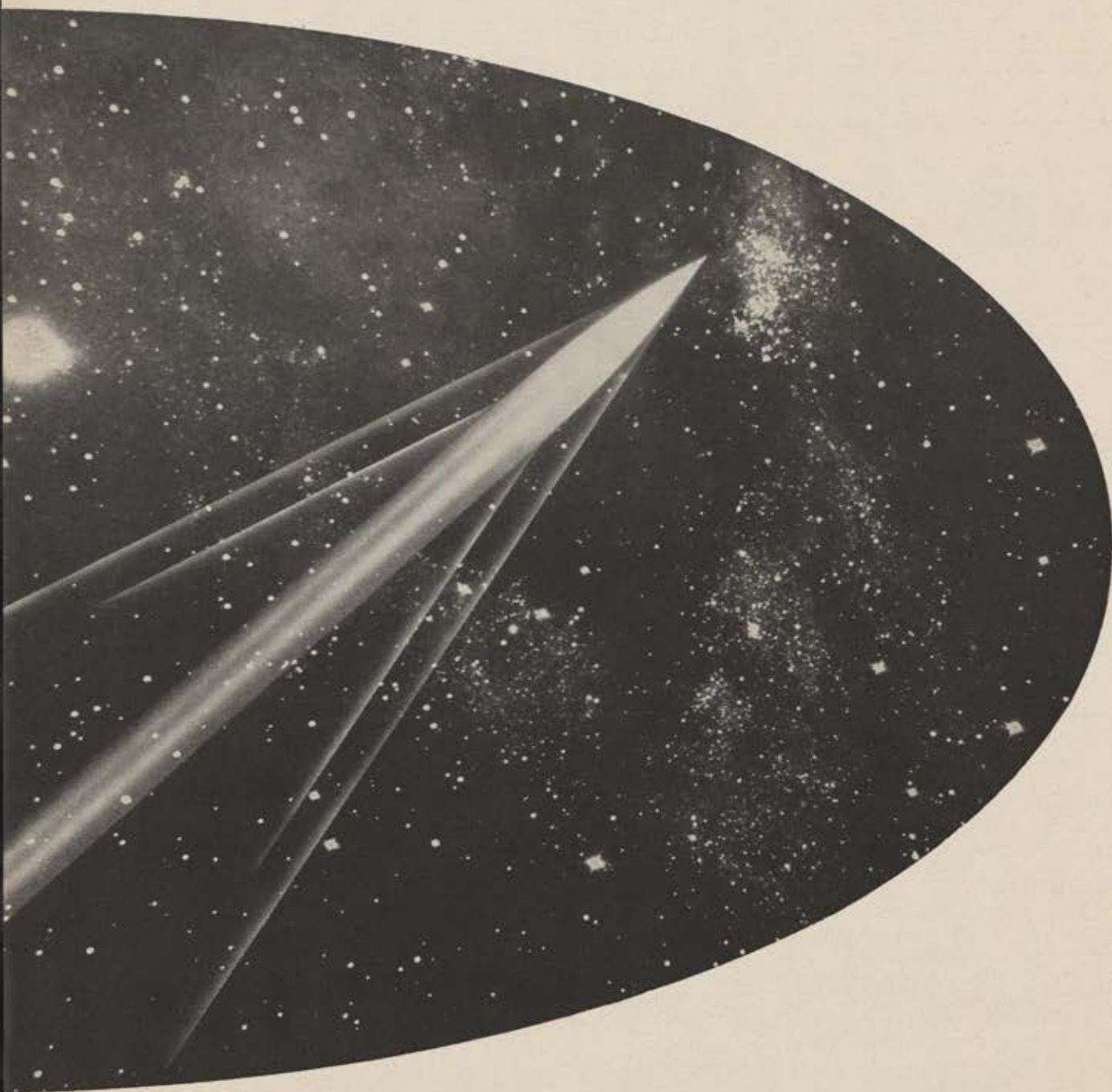


SUPERSONIC TODAY

The F-100 SUPER SABRE is the first supersonic operational fighter, and holds the world's first official supersonic speed record of 822.135 MPH. Now in the hands of the Air Force in quantity, the F-100 is produced at North American's plants in Los Angeles, California and Columbus, Ohio. Still faster, more effective fighter planes are—and will be—in continuous development at North American. A prime supplier of fighter aircraft to our Armed Services, North American also builds the F-100 SUPER SABRE as a fighter-bomber, the F-86 SABRE JET, FJ-series FURY Navy Fighters, and the T-28 high-speed Trainer.

NORTH

T H A N A N Y O T H E R C O M P A N Y I N T H E W O R L D



ULTRASONIC TOMORROW

We cannot picture or explain North American's progress on the SM-64 NAVAHO Intercontinental Guided Missile because of security restrictions. We can say that it will fly at speeds far beyond what we now call supersonic, be guided by an automatic navigator, flown by an automatic pilot, and driven by a high-thrust rocket engine. North American is one of the prime sources of research and development on our nation's guided missile program—a major addition to the long-range striking power and the aerial defenses of the nation.

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

AMERICAN AVIATION, INC.





air mail

Missing Pages, Anyone?

Gentlemen: I just received the January issue of AIR FORCE Magazine, from which, unfortunately, pages 27 to 42 are missing as were pages 79 to 94.

I hope that you will be able to send me a complete copy.

Maj. Otto W. Kuhlmann
Maxwell AFB, Ala.

• *Our printer tells us something went awry in the bindery. If other readers received incomplete copies, let us know and we'll send new ones.—The Editors.*

ANG Dilemma

Gentlemen: As spokesman for the Air National Guard, I wish to express our gratitude to Edmund F. Hogan for his article "Give Them the Tools," and to you for its publication in the December issue of AIR FORCE Magazine.

Mr. Hogan's long familiarity with the Air National Guard as well as his abilities as a writer are clearly evident in this incisive report on our aircraft situation.

We know that key officers of the United States Air Force are sympathetic to our urgent requirements for more and more modern equipment, but we know, too, that airplanes, in the final analysis, do not come from them. They come, instead, from the public as a direct result of the public's willingness to provide them.

Such willingness is based upon an understanding of the need, and we feel that you, Mr. Hogan, and AIR FORCE Magazine have contributed very greatly to that understanding.

So thoroughly do we feel thus, indeed, that—with your approval—we would like to reproduce the article for circulation in reader areas not encompassed by AFA membership.

Maj. Gen. Winston P. Wilson
Chief, AF Division, NGB
Washington, D. C.

• *Permission gladly granted.—The Editors.*

Gentlemen: Please relay my compliments to Edmund F. Hogan for his excellently written discussion of the Air National Guard's defense-mission dilemma.

In his December issue article, "Give

Them the Tools," Mr. Hogan has stated a problem that has confounded Air National Guardsmen ever since seventeen of our units were asked to contribute active-duty detachments to an augmentation of Air Defense Command. Specifically—

How are we to "knock down" a bomber at 50,000 feet in a fighter that is inadequate for combat at such altitudes?

We will get there—with such help as the Air Force, Air Defense Command, Air Force Association, and Ed Hogan have given us. But we will never make it in time unless the public examines the situation as thoroughly as you people obviously have and until it makes known its conclusions.

Maj. James F. Reid, AF, NGB
Washington, D. C.

Outmoded Concept?

Gentlemen: Reference de Seversky's January '56 AIR FORCE diatribe. His concepts and their presentation have not changed for the past fifteen years—and a lot has happened technologically in that period of time.

In that the rate of technological development from the standpoint of innovation has accelerated, is he really serious in advocating a single medium application of national military power?

Am also interested in knowing the names of a few of the vessels operating as "Army troop transports."

A. J. Siracuse
Fort Lewis, Wash.

Flamingo Wing

Gentlemen: As usual, I found the December issue of AIR FORCE Magazine informative and stimulating and have read several of its articles with keen interest.

I want to refer especially to the one titled "The Flamingo Wing—Tops in the Nation." The recognition accorded this outstanding Reserve wing by the Air Force Association last August, and the editorial treatment you have now given to its recruitment program, are constructive and sincerely appreciated. By describing the imaginative hard work which made the 435th the best-manned Reserve wing in the country, you are performing a service to the whole Reserve program. The article will, I am sure, make inspiring reading for the many active Reservists in your Association.

Maj. Gen. William E. Hall
Asst. Chief of Staff for
Reserve Forces
Washington, D. C.

Gentlemen: Your ably-prepared and highly complimentary article on the Flamingo Wing was read with much enthusiasm by members of my staff and by me. For this recognition I am grateful, and I am certain that my feelings will be shared by all members, officers and airmen alike, at the Flying Center.

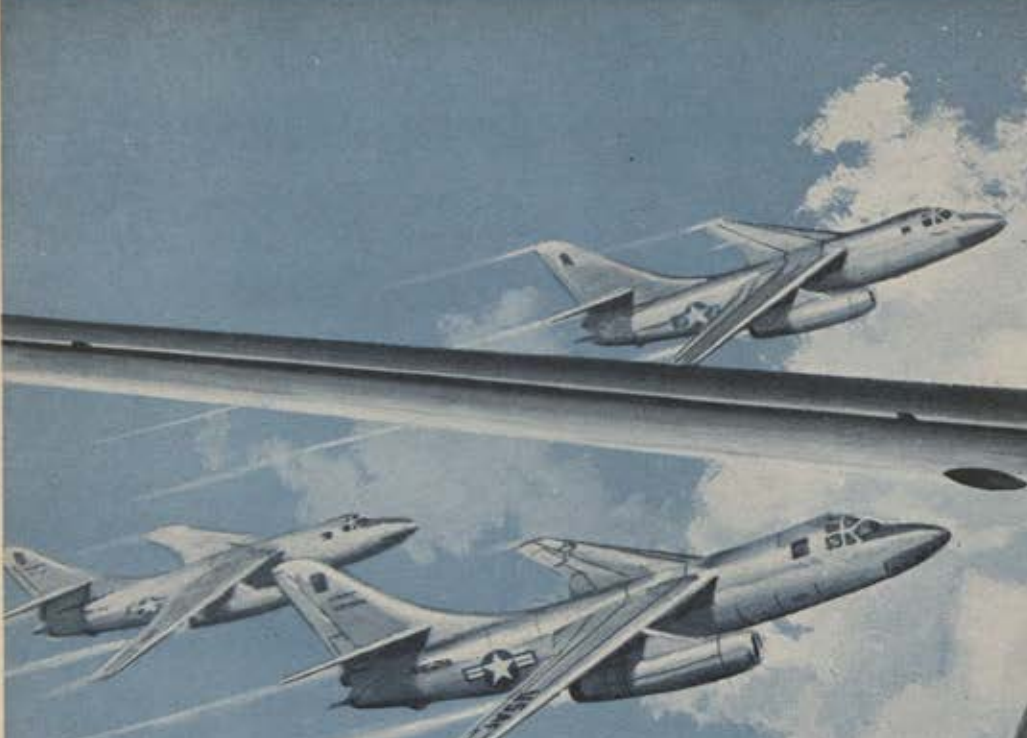
Col. Hadley B. Elikier, Commander
Miami Air Reserve Flying Center
Miami, Fla.

Why Not Tell Them?

Gentlemen: It was with great dissatisfaction that I read in "The Ready Room" that there are sixty-six locations in this country opposed to military flying. No doubt they consider their reasons for this opposition more important than an adequate air defense system which the Air Force is trying to establish. Perhaps this situation could be corrected if we were told the level truth about how we

(Continued on page 7)

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stand in our potential defense. We hear repeated claims about one missile or another, supposedly infallible, and then some time later it is found to be lacking in one essential characteristic or another. The same is true of our piloted aircraft potential. We've heard that we could never knock down all the aggressors that might come over, or even hope for a good percentage. Other sources promise good results if needed. What are we to believe?

If our air defense is inadequate, why not make it public? If the people living around some fighter base knew that the Reserve and Guard crews had to keep in top shape in order to insure protection of our vital areas, perhaps they might wake up in the wee hours and be glad the noise is ours and not the enemy's.

William C. Grayson, AF-ROTC
New York, N. Y.

Liquid Rocket Engines

Gentlemen: The article entitled "Give Them the Tools," by Edmund F. Hogan, in your December '55 issue very effectively pointed out one of the weak areas in our national defense. Airplanes available to the Air National Guard (i.e., surplus for the Air Force) are usually quite obsolete and incapable of performing modern missions. A production program, however, which would provide the Air National Guard with Century-Series fighters, for example, could represent a serious financial burden. One should question whether there is any other solution to this dilemma.

It is believed that such an alternate solution does exist. The Air National Guard could take the airplanes becoming obsolete and by adding liquid rockets for in-flight thrust augmentation, improve their performance to the extent required for present combat problems. The penalty paid would be decreased cruise range and greater take-off weight, both of which, however, are not incompatible with the role of the Air National Guard.

It thus appears that by application of a liquid rocket engine, at a minor cost compared to that of a new airplane, the Air National Guard and our overseas allies could be given airplanes with the basic capability of intercepting modern high flying aircraft.

Robert Gordon
Aerojet-General Corp.
Azusa, Calif.

B-50 Is Correct

Gentlemen: January's issue was the best yet. However, I did notice another little error that seems to crop up at

Dear Linda-bird:

It's a fine winter day at Dallas — snow up to my antenna-loop and dogs mushing about Southwest Airmotive's flight line toting rum-kegs on their necks, seeking lost aviators. Thank goodness tomorrow's forecast is 99 degrees and dust!

I'm dreamin' how you, as a kid, liked to h'ist your nighty and plant your fat little legs and knobby little knees by the fire, warming your backside. I bet you haven't changed a bit way off at college. Are your ankles still bigger'n your calves? Ho-ho-ho.

Memory fires are nice, but some others aren't.

Today, SAC's putting fire resistant Aeroquip prop feathering lines in my Lodestar per CAA AD Note 55-15-3, mandatory for airlines flying certain Douglas and Lockheed airplanes. I found long ago what's good for airline boys generally is good for business pilots, too. Besides, I've been an Aeroquip hose man like you're a nylon hose girl — since '43 when the Air Force installed it in that heep I flew droppin' eggs on Adolf. Its reusable, detachable fittings; quick-disconnect. Self-sealing Couplings, and overall reliability put Aeroquip's original design as far out front as Jane Russell's T-shirt.

And sweetie, until Aeroquip makes a fire-resistant bustle, stop warmin' yours by the hearth. Besides, it ain't ladylike for a brown-haired, hazel-eyed kid who's blossomed to 112 lbs., 5'6", and 18!!

Love,

Daddy

SOUTHWEST AIRMOTIVE CO. • LOVE FIELD • DALLAS, TEXAS

*A letter from
Daddy*
TO: LINDA HENRICH



least once every issue, i.e., the captions under the pictures. On page 38 you show "a B-29 [crouching] over the rocket-powered Bell X-2." This is not a B-29 but a B-50. The B-29 does not have air intakes underneath the nacelles.

Ralph R. Nash
Montreal, Canada

We're Curious, Too

Gentlemen: Over the years I have followed your publication and enjoyed it very much, but I have been waiting in vain for some calm and sober information on flying saucers. It would

seem that a journal devoted to airpower would find this subject within the scope of its function and duty to report upon.

I have heard of several reports where jets were seen chasing objects of this category; and one case of even shooting at them—though I find the latter difficult to believe.

Anything in your magazine on the subject I could accept as factual, but if—to date—there has been any sincere treatment of the subject, I have missed it.

In England, in 1944, I read some
(Continued on following page)

Through the altitude barrier with **Scott** PRESSURE SUIT OXYGEN REGULATOR



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Military pilots are protected against the dangers of cabin pressure loss in Strategic Air Command B-57 Bombers equipped with the new MB-1 Oxygen Regulator. Automatic, fool-proof operation at deadly altitudes insures a completed mission. This amazing new regulator is a recent achievement of Scott-Firewel developed in conjunction with the Air Force Aero Medical Laboratory. It is designed to meet the requirements of the Air Force Partial Pressure Suit but may also be used with the Standard A-13A Oxygen Mask. The MB-3 Regulator with dilution is also available in this pressure suit series.

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AIR MAIL _____ CONTINUED

reports of Foo-Fighter sightings, but since then nothing official. Last summer's release on the closing of Project "Blue Book" didn't seem to say anything that I could understand. What is the real "low-down," anyway?

Glenn Keith
Naples, N. Y.

• We just can't give you the real "low-down," and have an idea that no one can. When, as, or if we can develop or find what we consider the definitive saucer story, we shall certainly print it.—The Editors.

'Your Finest Issue'

Gentlemen: I have just finished reading through from cover to cover the January '56 issue of AIR FORCE. In all the years I've been reading the magazine, both during the war and in more recent years, I must say that this is the finest issue that I can remember. It is packed from cover to cover with some brilliantly written, thought provoking and timely material. I think the staff of AIR FORCE deserves a rousing ovation for this one.

P. J. Schenk
General Electric Company
Utica, N. Y.

Trophy Winners

Gentlemen: Thank you for the fine coverage of our Center in the January issue of AIR FORCE. Both the cover picture and the feature article were excellent. So, too, was the detailed information about our activity. We appreciate it.

Your awarding of the Mackay Trophy to me was also flattering... though in error and unjust to the actual recipient. If you must accredit me personally with something, I suggest the Thompson Trophy in 1953 in an F-86D at 690 miles per hour.

Brig. Gen. J. S. Holtner
Commander
Edwards AFB, Calif.

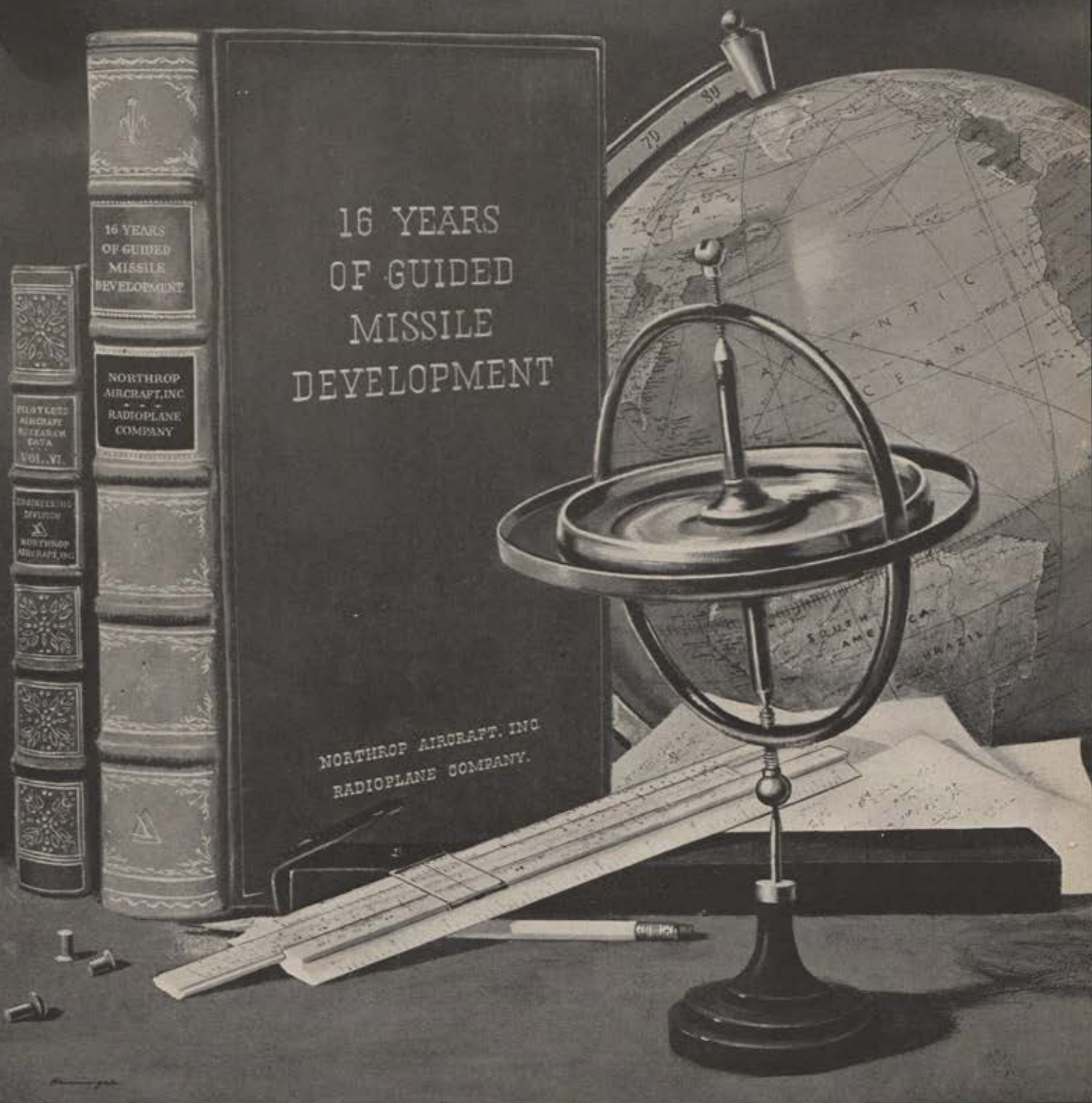
• Our apologies to General Holtner as well as to 1951 Mackay Trophy winner AF Col. Fred Ascani.—The Editors.

1,000 MPH

Gentlemen: In the January '56 issue of AIR FORCE the caption to a figure on page 37 states that the velocities of rocket-powered sleds exceed 10,000 mph. Is this correct?

George E. Duvall
Menlo Park, Calif.

• The sleds hit 1,000 mph. The track is 10,000 feet long.—The Editors.



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NEW FAIRCHILD SHIPBOARD RADAR SYSTEM FOR AUTOMATIC SEARCH AND TRACKING

Fairchild radar systems have gone to sea with missile launching cruisers of the U. S. Navy.

Now operating with the fleet, the Fairchild SPQ-2 Shipboard Radar System shown here was developed to search out and track either missiles or aircraft completely automatically. And, controls have been "human-engineered" to facilitate operation under battle conditions.

Color and shape coding in this new Fairchild radar assure rapid, sure identification of all controls. Rugged, shock-resistant construction protects equipment.

Here again is proof of Fairchild Guided Missiles Division's continuing leadership in design, research and production of vital electronic equipment.

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AIR FORCE

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Will You Be There?

SEE PAGE 65



Twenty-two airports in the United States account for sixty-five percent of airline passengers.

As many as 25,000 birds have been killed at one airport in a single night when temporarily blinded or otherwise confused by vertical light beams used to measure the ceiling. The bird losses occur only in autumn on the flight south. Filters will be used to allow only the ultraviolet or black light to go upwards, which has no effect on the migrating birds.

When a New York Airways helicopter pilot with four passengers made an emergency landing in Central Park he was served with a police summons. The charge: landing



in a public park without permission. But the Police Department later tore up the tag when it was learned that the law permits landing in parks if you really have to.

Eighty percent of the 6,921 civil airports in the United States have no paved runways.

A flock of ducks flying in a snowstorm at Hot Springs, S. D., crashed into the airport runway which they apparently mistook for a lake. The toll was 200 dead ducks.

In sixteen years Pan American Airways has safely carried two million international passengers across more than twenty million miles of ocean.

One out of every twelve acres of land under cultivation in the United States is treated with chemicals from the air.

Aerial dusting and spraying of 200 different types of farm crops requires as much flying time as American and United Airlines combined.

Las Vegas, Nev., with a population of 24,000 but a great many visitors, originated 192,000 air passengers last year. This was almost as many passengers as flew out of Birmingham, Ala., whose population is thirteen times greater than Las Vegas's.

One out of every three passengers flying British Overseas Airways is an animal. The animal hostel at London Airport accommodates 50,000 guests per month.



Another B-52 source goes into action

When world conditions indicated the need for more B-52 global jet bombers, the Air Force ordered this vital defense weapon into accelerated production, and named Boeing's Wichita Division as the second source for B-52s.

Above—on schedule—the first B-52 rolls off the Wichita production lines. Earlier, while the Strategic Air Command was converting to B-47s, Boeing-Wichita turned out these six-jet bombers at a one-a-day clip. It is currently in its 49th consecutive month of on-schedule production. Now that B-52s are in stepped-up

demand, Boeing-Wichita has accomplished the tremendous task of continuing B-47 deliveries, and at the same time tooling up and going into production on the B-52. This feat demonstrates the vast range of the Division's facilities and manpower resources. It adds Wichita-built B-52s to the steady procession being turned out by Boeing's Seattle plant.

The B-52, along with the B-47, rounds out the striking power of the U. S. Air Force. This team of Boeing heavy and medium bombers will be joined later on by still another Boeing, the KC-135 jet tanker.

The design advances that give the B-52 its revolutionary performance required equally revolutionary production methods. The company's manufacturing divisions, as they had in the case of earlier Boeing designs, devised new ways to produce a new kind of aerial weapon—efficiently, in volume, and on schedule.

The B-52 is an intercontinental nuclear weapons carrier, with a gross weight of over 175 tons. It is capable of operating at speeds beyond 650 miles an hour and at altitudes over 10 miles. Its mission: to retaliate against any aggressor, anywhere.

BOEING

Hand it to CHANDLER-EVANS . . . *for Development*

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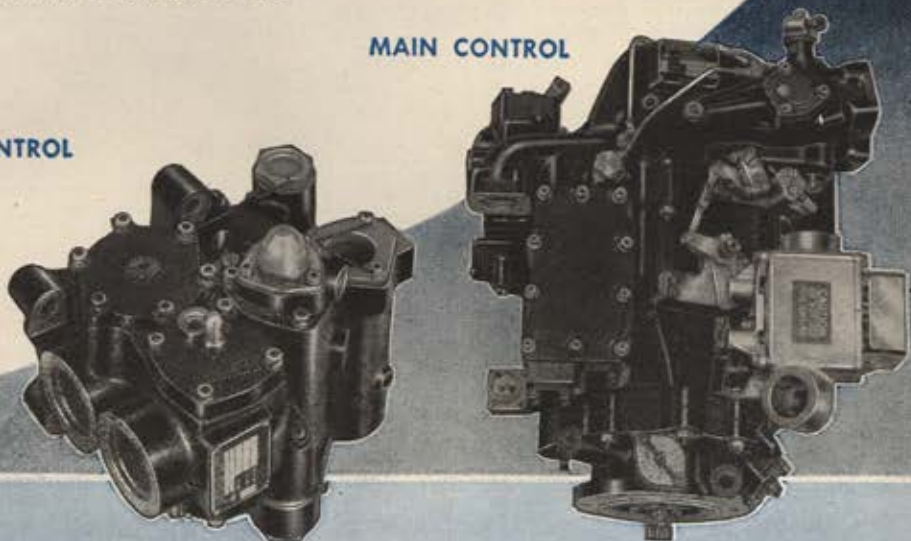
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MAIN CONTROL

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PIONEER PRODUCERS OF

JET ENGINE FUEL CONTROLS • AFTERBURNER CONTROLS • PUMPS • SERVOMECHANISMS • CARBURETORS • PROTEK PLUGS

■ Because the US would probably suffer grave industrial damage at the outset of an all-out air-atomic war, the AF has come up with a plan designed to enable this country to rise up out of the ashes and fight on. Basically, the plan would step up production of surviving defense plants to supply high-priority equipment during the decisive phase of the war—estimated at from sixty to ninety days. The most vital aircraft, missiles, and support equipment would be assigned priorities, and production plants would be required to be prepared—with machine tools and raw forgings on hand—to immediately step up production of the items at the outbreak of a war. The three categories of priorities are: **Category A**—weapon systems that must be kept in active production under the most austere emergency conditions; **Category B**—weapons not in the highest priority class that would be kept in production under “adverse” conditions; **Category C**—items “for which production planning is desirable,” but which would not nec-

Maj. Lonnie R. Moore, double jet ace, was killed January 10 when his F-101 Voodoo crashed and exploded at Eglin AFB, as he was taking off. His score during the Korean war—eleven kills, one damaged, and two probables.



essarily be kept in production at the outbreak of a general war.

■ Double jet ace Maj. Lonnie Moore was killed on January 10 in the crash and explosion of his McDonnell F-101 Voodoo as he was taking off on a check-out flight from Eglin AFB, Fla. He became history's thirty-third jet ace on June 18, 1953 when he shot down his fifth MIG-15 in Korea's MIG Alley. He later destroyed six more MIGs. A native of Houston, Tex., he entered the Army after graduation from high school in 1937. He became an aviation cadet in 1942 and received his wings and commission in 1943. A World War II B-26 pilot in the European theater, he was shot down twice but evaded capture both times. Moore served for a time as chief project officer of the AF's first supersonic jet fighter, the North American F-100 Super Sabre, and was the holder of fourteen decorations, including the Distinguished Service Cross, the nation's second highest award. Major Moore's wife and their four children live in Fort Walton Beach, Fla.

■ AF Secretary Donald A. Quarles doesn't think the Chinese Reds will risk an all-out war by attacking any of the Nationalist-held islands off the Chinese mainland. Asked during his latest tour of the Far East about the possibility of such an attack, Secretary Quarles replied: “I am sure they recognize that it is part of a global position, and I would think that it would be most unwise of them to risk an attack against that position.” He also said that

the Nationalist Air Force must be given nuclear weapons if the Communists did attack Formosa. He did not think that the Reds' numerical superiority (7,000 aircraft in the Far East against our 2,000) was significant because “we have today in Free World airpower a very satisfactory response to the build-up of Communist airpower.” He said he felt “very optimistic” that there would be no general war in 1956.

■ Ocean water is a potential reservoir of fuel, according to Dr. Clarence E. Larson, formerly with the Atomic Energy Commission and now vice president in charge of research for the National Carbon Co. “If you can visualize all of the oceans of the world turned into gasoline,” he said, “you have a rough idea of the potential energy reserve if we can but harness the thermonuclear [H-bomb] reaction.” Deuterium, or “heavy” hydrogen in ordinary water contains more energy than that found in the same



AF Secretary Donald A. Quarles answers questions at a Tokyo luncheon. From left: Gen. Lyman L. Lemnitzer, Far East UN Commander; Naka Funada, of the Japan Defense Agency; Mr. Quarles; Gen. Laurence S. Kuter, FEAF Commander; Wilfred J. McNeil, Assistant Secretary of Defense, Comptroller; Tadanori Nagayama, Japan Defense Agency.

volume of gasoline, and if the H-bomb fusion reaction could be tamed, according to the AEC, the deuterium would most likely be used for power in commercial applications.

■ The new director of Lockheed Aircraft's Missile Systems Division Research Laboratory, which was recently plagued by mass resignations, is Dr. Louis N. Ridenour, the USAF's first Chief Scientist and a former member of the USAF Scientific Advisory Board. He replaces Dr. Ernst Krause, who, with about a dozen more key scientists in the division, resigned in December because of a disagreement over the relative roles of research scientists and aeronautical engineers in development of “uninhabited” aerial vehicles. A rift had become imminent about a month earlier when Lt. Gen. Elwood R. Quesada, USAF-Ret., resigned as head of the division. He declined to comment, but it is assumed that his resignation was caused by the same policy conflict. The scientists claimed that the engineers wanted to dominate missile development, while management said the scientists, trying to monopolize the projects, wanted to invade executive and administrative functions.

(Continued on following page)

■ Australian Air Force pilots are practicing wild west techniques in the sky these days. They have developed a new technique for "lassoing" experimental rockets in mid-air to prevent them from hitting the ground and being banged up. Using the technique at the Woomera rocket range in Australia, the pilots intercept the rockets and snare them with a loop-like device near the tail of the airplane. They have become so expert, according to Australian Supply Minister Howard Beale, that they catch nine out of ten of the rockets fired.

■ The AF has denied a published report that the Strategic Air Command keeps a fleet of long-range bombers—loaded with atomic weapons—in the air at all times. "A certain percentage" of bombers are kept aloft, to assure the survival of a sizeable, ready force if SAC bases should be attacked. These planes could pick up nuclear weapons from widely scattered points in the US in about an hour.



Richard T. Whitecomb, right, NACA research scientist, receives the Exceptional Service Award from AF Secretary Donald A. Quarles for his research on the "Area Rule." NACA Chairman Dr. Jerome C. Hunsaker holds a model of the F-102, one of the planes made faster by the principle.

■ The man who will go down in history as the first Superintendent of the Air Force Academy plans to retire from active duty sometime this year. Lt. Gen. Hubert R. Harmon, a West Point classmate of Dwight D. Eisenhower's, was recalled to active duty by the President to guide the Academy through its planning stage and later was named Superintendent. According to an Academy announcement, "General Harmon has been offered the presidency of the Kelly Field National Bank at San Antonio, Tex. If this offer is still open when he is returned to retired status, he intends to accept it. However, he has no intention of resigning as Superintendent of the Academy to do so."

■ A new NATO radar warning system stretching from Norway to Turkey has been approved by the North Atlantic Treaty Council. European air defense has traditionally been left to the various member nations and has been considered one of the weakest links in the whole defense set-up. While Gen. Alfred M. Gruenther's headquarters will not take over the actual command of these defenses at present, the new system will enable them to better coordinate Western Europe's air defense. The new system will be divided into four main regions—the north area (Norway and Denmark); the central (France and neighboring states); the south (Italy, Greece, and Turkey); and the United Kingdom. According to General Gruenther, the new system will use a new method of radio communica-

tion that is said to be as jam-proof as communications can be made. Developed in the US and called the "scatter system," it works by bouncing transmissions off the troposphere and the ionosphere.

■ It takes more than just a "fender-bender" with a mallet to repair the skin of the AF's newest high-speed planes. According to Lt. Gen. Truman H. Landon, the AF Inspector General, the new planes require such exact structural shaping for approaching or passing Mach one that only specially trained experts can handle it. The AF has issued instructions that mechanics can no longer repair the skin on such planes as the B-47, the B-52, and the Century Series of fighters unless they have received the special training in engineering analysis required.

■ At a time when everyone was talking about the new American jet transports, the British dramatically called

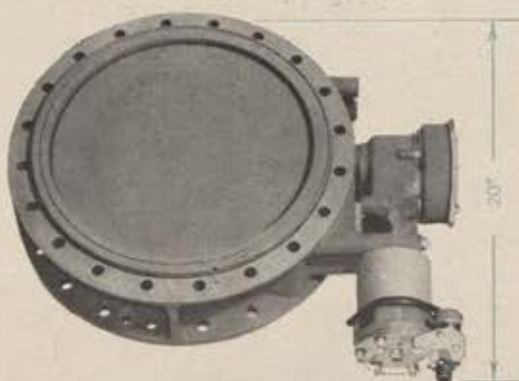


Wide World Photos, Inc.
Vice President Richard Nixon and three winners of top 1955 aviation awards look at a replica of the Wright Brothers' airplane. From left: Willis Brown, Frank C. Brewer Trophy; Richard Whitecomb, Collier Trophy; Nixon; and Dr. Hugh Dryden, Wright Brothers Memorial Trophy.

attention to their de Havilland Comet III by sending it around the world before the first of the year. A proving model for the Comet IV, which the British hope will be an answer to the Douglas and Boeing jets, the Comet III covered the 30,041-mile route in sixty-six hours and forty-three minutes of flying time but with a total elapsed time of twenty-six days. The last leg of the trip, from Montreal to London, took six hours and eighteen minutes, and marked the first crossing of the Atlantic by a passenger jetliner. The British, after leading the world in jet transportation by putting early models of the Comet into regularly scheduled service, lost their jet lead after a series of tragic crashes grounded the de Havilland planes in 1954. British hopes for jet supremacy were dealt another serious blow in 1955 when the government announced it was stopping work on the Vickers 1000 jet transport, a plane designed to compete with the Boeing 707 and the Douglas DC-8 for transatlantic traffic.

■ As a result of negotiations between the Civil Aeronautics Administration, the Commerce Department, and the AF, military radar will be used to control civilian aircraft movements for the first time beginning June 1. First use of the plan will be to control civil aircraft movements in the area of the Olathe Naval Air Station, Olathe, Kan., with data from ADC radar scopes.

(Continued on page 19)



It's mighty cold

where these valves
are going!

LIKE ALL CLARY CONTROLS

for guided missiles, the valves you see on this page are built to withstand extreme environmental conditions. They are required to operate in temperatures ranging from 160 degrees above zero to 320 degrees below!

Their *reliability* and watchmaker *precision* are characteristic of all Clary automatic controls.

We're very proud that Clary-manufactured valves and other Clary components have been chosen for such important guided missiles as Firestone's *Corporal*, North American's *Navaho*, and other Army and Air Force missiles.

COMPLETE, FOLLOW-THROUGH SERVICE on automatic controls is a Clary specialty and includes:

- **DESIGNING AND TESTING** to established specifications and envelope drawings.
 - **PRODUCTION-ENGINEERING** of parts or complete components covered by your prototype sketches or drawings.
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- So when *reliability* and *service* are vital in your plans, please call Clary.

Above left, gate-type propellant valve;
right, check valve
Below, "CORPORAL" propellant valve.



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POWERFUL MIDGET

RAYTHEON Silicon Power Rectifier

Typical of Raytheon's new approach to old problems is this revolutionary Silicon Power Rectifier. It is superior to ordinary rectifiers six ways:

- Extremely small, rugged, reliable
- Wider temperature range (-55° to +170° C.)
- Higher voltage rating (200 volts peak)
- Higher current rating (15 amperes)
- Negligible voltage drop
- Efficiencies over 99% (depending on circuit used)

This Raytheon "first"—with major applications in military aircraft, guided missiles and in many other areas requiring DC power—is further evidence of Raytheon's "Excellence in Electronics."



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■ At its Paris meeting in December, the Council of the North Atlantic Treaty Organization approved a new allied air force that will team American and Italian jets in Northern Italy. The new plan calls for a partnership between the Italian 56th Tactical Air Force, based at Vincenza, and a wing of USAF F-86 Sabrejets. The primary mission of the new air force will be to work closely with the newly formed Southern European Task Force (SETAF). While SETAF is a ground force with an atomic capability, built around a battery of the Army's Honest John rockets, the air battle would have to be going on while it was getting into action.

■ Thomas G. Lanphier, Jr., National Director of AFA and vice president of Convair, was reelected president of the National Aeronautic Association for another year in December. Miss Jacqueline Cochran, the famous aviatrix who is currently campaigning for Congress in California,



Col. William L. (Billy) Mitchell, left, and Gary Cooper as Billy Mitchell in the new Warner Brothers film "The Court Martial of Billy Mitchell." The two photos will appear side-by-side in the permanent William L. Mitchell Exhibit, Aeronautical Hall, in the Smithsonian Institution.

was reelected as NAA's first vice president. Others reelected for another year were: Mrs. M. T. Davis, secretary, and Edward C. Sweeney, treasurer.

■ Lt. Gen. Manuel J. Asensio headed the latest AF promotion list among the general officers when he received his third star. General Asensio is the new Deputy Chief of Staff, Comptroller, USAF. New major generals are: Alvord V. P. Anderson, Jr., Commander, Warner-Robins Air Materiel Area, AMC, Robins AFB, Ga.; Donald J. Keirn, Chief, Aircraft Nuclear Propulsion Branch, ARDC; Richard M. Montgomery, Chief of Staff, SAC, Offutt AFB, Nebr.; William S. Stone, Director, Personnel Planning, DCS/P; Brooke E. Allen, Commander, Continental Division, MATS; and Bernard A. Schriever, Commander, Western Development Division, ARDC. New brigadier generals are Elvin S. Ligon, Jr., Deputy Director, Personnel Planning, DCS/P; Andrew J. Kinney, Executive Assistant to the Secretary of the Air Force; James B. Knapp, Commander 6606th AB Wing, NEAC; Arthur C. Agan, Jr., Deputy for Operations, Eastern Air Defense Force, ADC, Stewart AFB, N. Y.; Thomas E. Moore, Deputy Chief of Staff, Operations, ATC, Scott AFB, Ill.; John K. Hester, Commander, 806th Air Division, SAC, Lake Charles AFB, La.; David A. Burchinal, Chief of Staff, Eighth Air Force, SAC, Westover AFB, Mass.; and William W. Momyer,

Commander, 312th Fighter-Bomber Wing, TAC, Clovis AFB, N. Mex.

■ **STAFF CHANGES**—Lt. Gen. Leon W. Johnson, formerly ConAC Commander and more recently Senior AF member on the Military Staff Committee of the United Nations, has been named to take over Army Gen. J. Lawton Collins' post as US representative to the Military Committee and Standing Group of NATO when General Collins retires March 1. General Johnson, who is fifty-one, holds the Congressional Medal of Honor. His replacement at ConAC is Lt. Gen. Charles D. Stone, formerly DCS/Comptroller, Hq., USAF. Lt. Gen. Manuel J. Asensio has been assigned duty at Hq., USAF, as DCS/Comptroller. He was formerly Vice Commander of ConAC. . . . Brig. Gen. Thomas C. Musgrave, Jr., has been appointed Deputy Director, Manpower and Organization, DCS/O, Hq., USAF, effective April 1. He was formerly Deputy US



Maj. Gen. Morris J. Lee gets the Distinguished Service Medal from AF Chief of Staff Gen. Nathan F. Twining. As Director of Personnel Planning, DCS/Personnel, he served as AF representative on a Defense Department Committee looking for ways to make service careers more attractive. He was cited for the period June 1952 to September 1955.

Representative, Standing Group, NATO. . . . Maj. Gen. Lucas V. Beau has retired. His replacement as Commander of the Civil Air Patrol is Maj. Gen. Walter R. Agee. General Agee was Deputy Commander until General Beau's retirement, December 31. . . . Maj. Gen. Mark E. Bradley, Deputy Commander-in-Chief, USAFE, has been relieved from added duty, Chief of Staff, USAFE. . . . Brig. Gen. Charles B. Westover, formerly Commander, 12th Air Division, March AFB, Calif., is the new Commander, 819th Air Division, Abilene AFB, Abilene, Tex. . . . Brig. Gen. John R. Sutherland, has been appointed Chief of Staff, Fifteenth AF, March AFB, Calif. He was reassigned from duty as Commander, 802d Air Division, Smoky Hill AFB, Salina, Kan. . . . Brig. Gen. Kenneth O. Sanborn has been assigned duty as Commander, 820th Air Division, Plattsburg AFB, Plattsburg, N. Y. He was formerly Commander, 6th Air Division, MacDill AFB, Fla. . . . Brig. Gen. Walter E. Arnold is the new Commander, 817th Air Division, Portsmouth AFB, Portsmouth, N. H. His last duty assignment was Chief of Staff, Fifteenth AF, March AFB, Calif. . . . Maj. Gen. Frank H. Robinson is the new Commander, Crew Training Air Force, Randolph AFB, Tex. In his former spot as Chief of Staff, Air Training Command, Scott AFB, Ill., is Brig. Gen. Henry R. Spicer.—END

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America Continues Its Leadership
in Commercial Aviation with

TRANS-OCEANIC JET AIRLINERS



Pan American...
Boeing...
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Establish New Jet Transport Age

The American fleet continues to expand the jet age of aviation... The Pratt & Whitney J57 turbojet engine... The J57 is the most powerful jet engine in the world... The J57 is the most powerful jet engine in the world...

PRATT & WHITNEY

KLM WILL FLY JET AIRLINERS ON GLOBAL ROUTES



KLM Royal Dutch Airlines
Buys Douglas DC-8 Jet Transports
With Pratt & Whitney Engines

The Douglas DC-8 is the most powerful jet transport in the world... The Douglas DC-8 is the most powerful jet transport in the world... The Douglas DC-8 is the most powerful jet transport in the world...

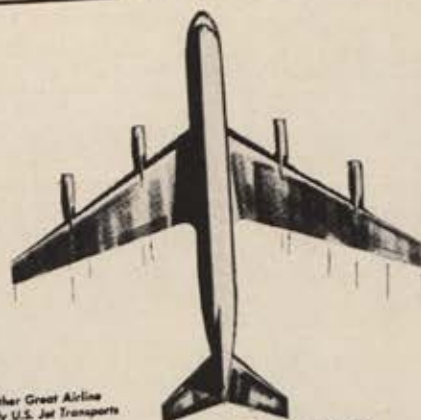
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Another Great Airline
to Fly U.S. Jet Transports

AXA AMERICAN AIRLINES
Orders Boeing 707 Jet Transports
with Pratt & Whitney Engines

The Boeing 707 is the most powerful jet transport in the world... The Boeing 707 is the most powerful jet transport in the world... The Boeing 707 is the most powerful jet transport in the world...

PRATT & WHITNEY AIRCRAFT

The jet air age is arriving for passenger travel with the new Boeing 707 and Douglas DC-8 jet transports. Leading U. S. and foreign airlines have recently announced orders for large quantities of the new transports, and still more orders are in prospect.

Both the Douglas DC-8 and the Boeing 707 airliners are powered by turbojet engines designed, developed and produced by Pratt & Whitney Aircraft. These are the J-57, most powerful jet engine in



U. S. aircraft industry continues leadership in commercial aviation

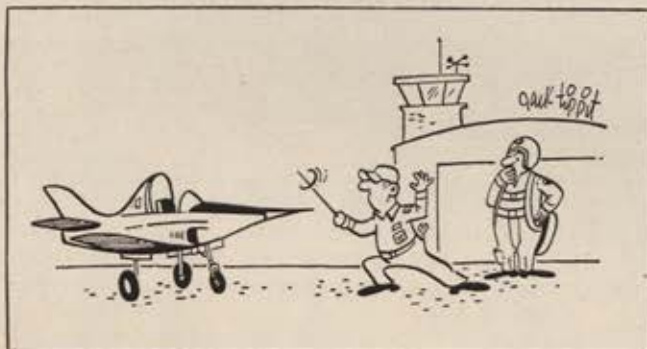
In the age of jet air travel now emerging, Pratt & Whitney Aircraft's dependable engines will continue to have a major role. They will help to demonstrate again the U. S. aircraft industry's continued leadership in commercial aviation.

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SHOOTING THE BREEZE

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

In case you had forgotten, we haven't. We celebrated AFA's tenth birthday in a mild way, preferring to save our strength for the big blowout in New Orleans in August. Yes, it was ten years ago last month that a group of Air Force veterans, determined to fight for principles of airpower, got together and informally banded into an organization they called the Air Force Association. As you all



know, Jimmy Doolittle was the first president. AFA was officially incorporated in Washington, D. C., in February 1946, the first local squadron was chartered in Baltimore in June. AIR FORCE Magazine joined the team in July 1946.

First active-duty member (they were called associates then) was Gen. Carl A. Spaatz, the chief of the AAF. Said General Spaatz at that time:

"With the demobilization, we in the Army Air Forces headquarters hoped that a plan would develop for making articulate those individuals who had gained an appreciation of the importance of airpower by their service in the Army Air Forces during the war.

"The reason for the existence of any organization must be of sufficient importance to merit the interest of the individual person. One of the compelling reasons for the existence of the Air Force Association is the protection of the place of the Army Air Forces as the keystone in national defense.

"By accepting men and women on active duty as associate members, the Association becomes a professional society of the Army Air Forces. It knits together our AAF family in a way that should become a national force for the promotion of airpower as the key to our national security."

We'll have more to say about the early days of AFA in future issues.



Incidental Intelligence—the clock in the sentry house at the entrance to SAC Headquarters, Offutt AFB, has "US Navy" in big letters across the face.



A Reuters dispatch from Australia says a tricky question on examination papers for Royal Australian Air Force trainees asks, "What is the first thing you would do if

you were piloting an aircraft and the Queen of England fell out of the back seat?"

Give up? The correct answer: "Adjust trim tabs to make allowance for the loss of a passenger."



General Twining put our airpower picture in pretty clear focus when he said, in an Oklahoma speech: "It is not our traditional forms of military power that have held the Reds in check. The Soviets have overwhelming strength on the ground. In size, the armies of the Free World are mere outposts by comparison. The Soviets need not fear our strength at sea, for they are not dependent upon using the seas.

"The Soviets fear our power in the air, and airpower has been the main reason for our peace and safety so far. It is airpower that gives us and our allies the best chance for staying safe in the future.

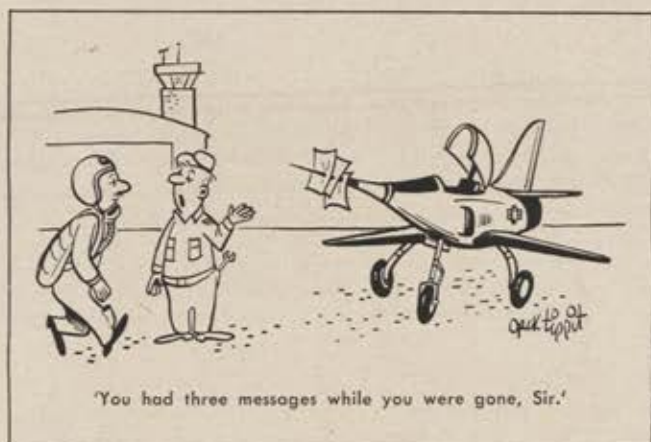
"There are those who resist acceptance of the Air Force's leading role in the deterrence of war. They point to the



Our Breezecake girl this month is Clara Vallaire, an assembler at AC Spark Plug Division of General Motors in Flint, Mich., who's holding a cutaway section and a finished plug of a type that seals against moisture, salt, and dirt, regardless of altitude. The caption declares that "ground-level atmospheric pressure is maintained in the plug even at very high altitudes, eliminating 'rough engine.'"



School kids of the Glen City School in Santa Paula, Calif., are having a whale of a time with their new piece of playground equipment—a surplus, obsolete Republic F-84B Thunderjet, which the AF officially gave them last month.



fact that airpower did not stop the Communist invasion of North Korea nor the defeat of the French at Dienbienphu.

"I cannot argue with these observations. In fact, I can add more along the same line. Airpower did not stop the riots in Cyprus, the skirmishes between Israel and Egypt, the bloodshed in Morocco and Algeria, and the sporadic artillery duels on Quemoy and Matsu.

"I could list a hundred other undesirable events that airpower has not prevented, but all of this does not detract from the one important fact: our American airpower has kept the one great potential enemy from attacking us. That has been and will be the great danger to us here at home."



Remember the World War II wheeze about the Western Union boy who got lost in the Pentagon and came out six months later as a full colonel? Something like that happened to us last month. A year ago AFA sponsored a Washington premiere of Jimmy Stewart's "Strategic Air Command." We mailed tickets and invitations on January 7, 1955. One set of tickets apparently kicked around the Concrete Cobweb for a year, was finally delivered on January 6, 1956. The recipient called to express his thanks but said he had long since seen the picture—at his neighborhood theater.



A Bolling AFB airman-musician has created quite a stir in the musical world. A1/C Serge de Gastyne's third symphony, "L'Île Lumière," was premiered by the Cin-

cinnati Symphony under the baton of Dr. Thor Johnson and drew rave notices, not only in the Cincinnati press but in Washington and other metropolitan areas. De Gastyne is a descendant of a French noble family, fought in the French resistance as a teen-ager, is married to the daughter of AF Gen. Richard C. Lindsay.



From an article entitled "Land Power as an Element of National Power" in the January *Army Combat Forces Journal*, by Hanson W. Baldwin:

"Let us now consider the role of land power in a completely unlimited nuclear war, with no holds barred and all weapons used against *any* targets. . . . Frankly, I do not believe that land power—at least as we know it now—would have much if any, role in such a slaughter. It



A1/C Serge de Gastyne goes over the score of his new symphony with Dr. Thor Johnson, conductor of the Cincinnati Symphony, before the work is premiered there.

would still strive to provide anti-aircraft defense against enemy air attacks. It might still fire guided missiles against the foe. But large-scale organized land armies could not live long on the battlefield, in my opinion, against such a rain of nuclear fire. Even dispersion would be of limited protection. If an army marched with all its soldiers a hundred yards apart, a one-megaton (million-ton) bomb

(Continued on following page)

would cause 16,950 casualties; a forty-megaton bomb would kill or wound 79,000 men."

This is one of many reasons we're glad we're an ex-infantryman.



The New Yorker magazine spotted this one, credited to an information folder given to the troops in Exercise Sagebrush—"Aircraft (high performance) will be considered friendly unless they make a hostile attack. If they make a hostile attack, they will be regarded as unfriendly."

Says *The New Yorker*, "Or even mean."



Latest addition to our staff is Robert C. Strobell, until recently Associate Curator of the National Air Museum, Smithsonian Institution. Bob flew eighty-one missions as a fighter pilot with the 8th AF. Got into technical in-



Outstanding performance as a jet crew chief earned for S/Sgt. Richard H. Holden a citation as "Engineering Airman of the Year" from Alaskan Air Command and, from Northrop Aircraft, Inc., an all-expense trip to Los Angeles.

telligence and was one of the first American pilots to fly the Messerschmitt ME-262 twin-jet fighter. He helped set up the AF Technical Museum at Wright-Patterson AFB, later became its chief. Moved to the Smithsonian in 1948. A native Vermonter, Bob has soloed fifteen different makes of aircraft. His staff work with AIR FORCE will include technical writing and general research. And maybe you think the telephone operators won't have fun with Jim Straubel and Bob Strobell!



Any doubts we may have had about the practicality of President Eisenhower's proposal to exchange military blueprints with Russia and maintain a mutual aerial inspection system with the Soviets were resolved by AFA's own Jimmy Doolittle. When asked his opinion on the matter, General Doolittle responded with his usual succinctness—"It's practical."



Here's how to cut red tape.

Sit down at your desk, take all the tricky problems out of your "In" basket and slip them under the corner of the carpet. Then nail down the carpet and forget about them.

Lord Windlesham told the House of Lords that he knew of a brigadier at the British War Office who followed this procedure and retired "full of years and honor."

New Executive Secretary of the Arnold Air Society is Louis J. Ciccoli, Lt. Col. (Ret.), formerly on the faculty of the University of Maryland.



His secret came out during a War Office spring cleaning when janitors found "dozens of files" under the carpet. Our problem is that our office is carpetless.



Not long ago a batch of Navy publicity photos arrived in the city room of the St. Paul (Minn.) *Pioneer-Press*. Protecting them against being bent in transit was a large hunk of cardboard which urged, in bright, red letters: "GO PLACES FASTER . . . US AIR FORCE."



A Minneapolis atheist is suing the government to eliminate chaplains from the armed forces. He says the chaplain system conflicts with the freedom of religion guaranteed in the First Amendment to the Constitution.



Reports that the Army's Redstone missile has a 200-mile range brought this caustic comment from a chap we know, "Gee, in only ten years they've got something almost as good as the German V-2."



A squib from Science Service says the AF's latest high-altitude flying suit was designed by a bra and girdle manufacturer—our uplifting thought of the month.



In our January issue we referred, in a story on Exercise Sagebrush, to Fairchild's C-123 as the "Avitruce." Bill Key, public relations director for Fairchild, reminds us that the official title is now "Provider."



Admiral Arthur W. Radford, Chairman of the Joint Chiefs, says, "Our Strategic Air Command has no equal in the world and I am quite sure we can keep it that way." We agree that we *can*. But we're not at all sure we *will*. (See page 30).



To those who say that Air Force service is a clean life, Col. Robert Lyons, an AF dermatologist in Europe, says "perhaps too clean." Colonel Lyons reports that one of the most common ailments among AF people and their families is "winter itch," caused by too many baths.



Two airmen who sued an AF light colonel for slander when he cussed them out lost their case in an Oklahoma City Federal court. The judge said the colonel's language was vulgar but not illegal.—END



Peace Officer *ready for war*

This man is a peace officer. His beat is the whole world, for he flies for TAC—the Tactical Air Forces of the U. S. Air Force.

Primary job of the Tactical Air Forces is to stamp out "brush fire" aggressions wherever they may occur. This is being accomplished by maintaining at combat readiness a completely self-contained striking force with a devastating nuclear punch, and a global reach.

Such a far-reaching assignment calls for versatility in men, equipment, techniques and weapons. Douglas is proud to have its planes included in the Tactical Air Command's inventory of fighters, bombers, transports and reconnaissance aircraft.



LONG-RANGE JET FOR
TAC RECONNAISSANCE—
DOUGLAS RB-66

Defense is everybody's business

The Douglas RB-66 can fly 600-700 mph but not without people to pilot and service it. The Air Force needs young men and women who agree that "defense is everybody's business."

Depend on **DOUGLAS**



First in Aviation



LEAR PRODUCES

This roster of Lear aviation products is, of necessity, incomplete. Many of these products are frequently combined to form an infinite variety of additional products or systems. Only enough typical devices are shown here to demonstrate Lear's mastery of a field of science and technology that uses thousands of such building blocks for meeting the highly specialized requirements of modern aircraft and missiles.

δ flight control systems

- Automatic altitude controllers
- Automatic approach couplers
- Automatic Mach number controllers
- Automatic pilots (lightplane)
- Automatic pilots (high-performance)
- Automatic pitch, yaw, and roll dampers
- Automatic rudder controllers
- Automatic wing flap systems
- Missile control systems
- Test equipment

σ flight reference systems

- No-gimbal-lock vertical gyro indicators
- Stable platforms
- Test equipment
- Three-axis gyro indicators
- Vertical gyro indicators

γ navigational systems

- Automatic radio direction finders
- Glide slope receivers
- High-latitude gyro compass systems
- Integrated ADF-magnetic compass systems
- Localizer receivers
- Marker beacon receivers
- VHF Omnitrange receivers

ξ electro-mechanical systems

- Artificial feel systems
- Camera positioners
- Canopy control systems
- Carburetor air door controllers
- Convertiplane rotor positioning systems
- Cowl flap positioners
- De-icing valve positioners
- Engine throttle controllers
- Gas, hydraulic, fuel, valve positioners
- Inlet screen retraction systems
- Inlet vane angle controllers
- Jettison systems
- Landing gear lock systems
- Mechanical advantage ratio changers
- Oil cooler flap controllers
- Parachute door systems
- Precision remote positioning systems
- Supercharger blower shifters
- Test equipment
- Throttle friction controllers
- Trim tab positioners
- Turbo-prop clutch valve controllers
- Wing flap positioning systems

λ electro-mechanical components

- Linear actuators
- Rotary actuators
- Servo actuators
- Power units
- Actuator controls
- Alternators
- Capstans

- Freewheeling clutches
- Friction clutches
- Magnetic clutches
- Slip overload clutches
- Electromagnetic brakes
- Flex drive H's, hex's, L's, and T's
- Flexible shafts
- Gearboxes
- Handcranks
- Motors (AC and DC)
- Enclosed fan motors
- Explosion proof motors
- Gearhead motors
- High frequency motors
- High temperature motors
- Miniature motors
- Pneumatic motors
- Servo motors
- Torque motors
- Screwjacks
- Load limit switches
- Position limit switches
- Programming switches

ζ instruments

- ADF indicators
- Attitude indicators, 2-axis
- Attitude indicators, 3-axis
- Directional indicators
- IAS indicators
- Integrated ADF-magnetic indicators
- Trim indicators
- Tuning meters
- Omnitrange indicators

μ instrument components

- Altitude transducers
- Vacuum tube amplifiers
- Magnetic amplifiers
- Printed and etched circuit amplifiers
- Transistor amplifiers
- Displacement gyros



for the precision needs of aviation

Dynamic pressure transducers
Gravity-sensing switches
Magnetic modulators
Magnetic powder clutches
AC and DC servo motors
Electric gyro motors
Flag motors
High-frequency motors
Torque motors
Power converters
Rate generators
Rate gyros
Resolvers
Synchros
Synchro repeaters

ψ *communications systems*

VHF, VHF, HF, MF, and LF receivers
VHF transceivers
VHF, HF, and MF transmitters
ADF receivers
Airport traffic transceivers
Monitoring transceivers
Portable transceivers
Telemetry receivers
Test equipment

ϵ *communications components*

Audio frequency amplifiers
Vacuum tube amplifiers
Magnetic amplifiers
Power amplifiers
Printed and etched circuit amplifiers
Transistor amplifiers
Aircraft broadband antennas
Ground plane antennas
LF-MF whip antennas
Loop antennas
Mobile antennas
Trailing wire antennas
VHF-VHF whip antennas
VHF Omnidirectional antennas

Antenna fairleads
Antenna reels
Antenna tuning coils
Cable assemblies
Coil assemblies
Crystals
Dynamotors
Headsets
Loudspeakers
Amplifying loudspeakers
Noise-cancelling microphones
Radio noise filters

ϕ *test equipment*

Bench test cable assemblies
Electronic test sets
Field strength meters
Pressurizing test kits
Universal electro-mechanical test stands
Universal motor test stands

η *fluid handling equipment*

Absolute pressure switches
Bombsight and instrument desiccators
Canopy seal pressurizing kits
Cooling units for electronic assemblies
Dehydrators
Fuel flow dividers
Pneumatic actuators
Pressurizing control panels
Alcohol pumps
Anti-detonant injection pumps
Ballast pumps
Bilge and refueling pumps
Dry air pumps
Electric motor driven pumps
Ethylene glycol and coolant pumps
Ethylene oxide pumps
Fuel pumps
Fuel booster pumps
Fuel filter de-icer pumps
Fuel transfer pumps

Hand operated pumps
Heater fuel pumps
Hydraulic pumps
Hydraulic oil booster pumps
Hydrogen peroxide pumps
Lube oil and scavenge pumps
Multiple-element pumps
Oil transfer pumps
Scavenge pumps
Smoke pumps
Submerged fuel booster pumps
Vacuum pumps
Water pumps
Radar pressurizing kits
Rocket engine fueling nozzles
Air relief valves
Check valves
Hydraulic valves
Hydraulic servo valves
Isobaric relief valves
Pressure regulating valves
Vacuum valves

π *miscellaneous*

Airborne television installations
Airplane brake modernization kits
Auxiliary power supplies
Electronic chassis assemblies
Executive airplanes
Periscope prism selectors
Precision remote positioners
Printed circuits
Radomes
Wire harnesses

LEAR

CP-12



THAT OTHERS MAY LIVE

This is the motto of the Air Rescue Service, proved by their actions. In one year alone, the 40 Air Rescue Squadrons flew 3,379 missions totaling 25,144 hours to give aid and comfort to 20,195 people, military and civilian, rescuing 1,949 from certain death. Grumman is proud to build the Albatross amphibians flown by the USAF Air Rescue Service.

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Last month this column pointed out why the Air Force has recently given greater emphasis to putting the airpower story between hard covers.

There is more behind the current Air Force book activity than just a military requirement. The story of the conquest of the air is largely the story of the USAF from its earliest days to the present. As the spearhead of America's air progress in both peace and in war, the USAF becomes the rightful custodian of the documentary record of American airpower. It follows that from the AF itself must come the initiative to produce a literature of the air.

Top airmen have long recognized this as an AF responsibility. They have given lip service to it but have found more important things to do than become patrons of literary art. And so today the Air Force and the American people, looking back over fifty years of aeronautical achievement on the one hand, see a literary desert on the other. Where is the record to tell future generations the story of the air pioneers; of the men and the machines; the bold concepts and deeds; of the sacrifices that contributed so much to the epic of flight?

Now the AF has acted to translate this story of the air into literature. AF Info Services has been given the job. The assignment of Brig. Gen. Robert L. Scott, an author in his own right, to the top AF Info Services slot has provided increased emphasis.

Current AF book activity is centered in a program designed to encourage and help writers and publishers. The object is to spur the publication of a number of books, from scholarly and professional tomes across the board to

the historical air novels and fiction. Official support is extended to any acceptable book proposal related directly or indirectly to AF subject matter.

Basically, the program adapts to book writing the services and techniques normally extended to magazines. But it goes much farther than just bringing together an idea, an author, and a publisher. Book preparation requires a great deal more. Official help is offered in planning a book project, developing the subject, locating research materials, advising on content, reviewing for accuracy and security, and guiding in placement for publication. When travel is essential to the project, the author is given authority to fly (space-available, via military air) wherever necessary in the Air Force to do research and gather background color.

Internal promotion of each published volume to the members of the AF family world-wide includes base newspaper reviews, plugs on AF radio and TV, local area PIO publicity, and the placing of copies in all AF libraries. One other step, now under study, would be an Air Force Book Club.

The book program has been warmly welcomed by writers and publishers. It has opened doors to unexploited literary opportunity. Now good book ideas, manuscripts of all kinds on the AF and airpower subjects, and "hungry" authors are needed. Of special interest to the program are personal narratives and operational subjects from World War II and Korea; memoirs and biographies of prominent airmen; airpower monographs; special studies; and edited collections.

To date, ten AF books have appeared. Most have been reviewed in this column. A complete listing along with more details about the program can be obtained by writing The Magazine and Book Branch, OIS, Hq. USAF, The Pentagon, Washington 25, D. C.—END

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PLUMBING FIXTURES • HEATING EQUIPMENT • ELECTRIC PLANTS • AIR-COOLED ENGINES • PRECISION CONTROLS

The next move is up to Congress

By John F. Loosbrock

MANAGING EDITOR, AIR FORCE MAGAZINE

FOLLOWING, as this does, on the heels of President Eisenhower's budget message, it might appear presumptuous for anyone as far down the totem pole as this writer to quarrel with its conclusions. Yet, an examination of the Air Force portion of the federal budget for Fiscal Year 1957 brings back some painful memories and raises some equally painful questions. Perhaps the questions will be answered if Congress delves into our airpower problems, as it has half promised to do. I am convinced, however, that if Congress probes deep enough and long enough, it will come face to face with the conclusions reached in this report.

Congress will discover, I believe, that the Air Force, under the bright new budget, becomes a strapping six-footer who is forced to move about and do his work under a five-foot ceiling. For, as usual, the Air Force's main problem is one of ceilings and floors—ceilings over manpower and money, floors under force levels and procurement.

To old-timers around Washington the situation has a familiar ring. Memories go back to an earlier election year—1950—after Louis Johnson had already stripped so much "fat" from our military structure that its naked ribs were beginning to bleach in the sun.

That was a year when knowledgeable airmen were

saying to themselves, and to the Secretary of Defense, "Let's face it. We can't get enough money to build the forty-eight-wing force we say we're building. Let's be honest with ourselves and with the taxpayers. If this is all the money we're going to get, let's take it and build forty-two good wings."

But these men, wise in the ways of air war, were not equally sensitive to the realities of political life in these United States.

It was an election year, remember? So what happened? The airmen were told: "You will get \$4.4 billions of dollars. That's 'all the economy will stand.' With this you will get a new obligational authority of \$81 million with which to buy aircraft and you will maintain 8,800 aircraft in forty-eight combat wings. This we have promised the voters. Voters understand tangible figures like number of wings and number of planes. With what's left over you will try to man and maintain these wings in something resembling combat readiness."

That summer the Reds invaded South Korea.

The situation today is similar in many ways. For the Administration program adheres to its original force level of 137 modern, combat-ready wings. But the Administration budget simply does not provide the necessary funds to attain these goals.

At the time of the "new look" or shortly thereafter, the Administration determined that both spending and new obligational authority for the build-up to 137 combat-ready wings by June 30, 1957, would have to level off at approximately \$16 billion annually. It is attempting to stay within those ceilings. However, since the original estimates of two years ago many new factors have been fed into the equation and it takes a bit of juggling to keep coming up with the same answer. Many programs that are clearly in the national need have been added. Many were accelerated by directives of the National Security Council and the Defense Department with little or no provision for the money to carry them out. In air defense alone the extension of the DEW (Distant Early Warning) line, development and procurement of gap filler radar, SAGE (Semi-automatic ground environment) and general improvement of our radar situation have been speeded up on paper but the application of spending and appropriations ceilings already have caused these programs to slip badly, in some cases more than a year.

The programs for the Intercontinental Ballistic Missile and its smaller cousin the IRBM (Intermediate Range Ballistic Missile) have been stepped up, as has procurement of certain aircraft, notably the B-52, F-101, F-104, and the KC-135 jet tanker. But the additional funds for these speed-ups must, in great part, come from other segments of the AF budget, such as maintenance and operations, and base construction.

Let's get more specific. How much money does the AF need to attain and maintain an austere 137-wing force? When the stark military requirements were first added up by the Air Force the figure came to something more than \$20 billion in new obligational authority. That, obviously, was politically out of the question. So the original estimates were put on the Procrustean bed and either pruned or stretched out, as the case might be, until a "reasonable" figure just slightly under \$19 billion went forward to Department of Defense. A series of conferences and "budget exercises" ensued. It was reported that at one point the figure got as low as \$15 billion. The final figure, as outlined in the President's budget message, stands at \$16.518 billion. This includes half a million dollars added at the last minute only through a firm stand by the Air Force heads, the increase going largely to procurement.

So, unless the Congress takes some drastic action, the

Air Force will get something like \$4 billion less than it thinks it needs and some \$2 billion less than it had the nerve to ask for.

What does this mean, in terms of combat capability?

It means that we will not have a modern, combat-ready 137-wing Air Force by the announced target date of June 30, 1957.

It means that we will not have the bases for this force in the foreseeable future, let alone by June 30, 1957. The base construction program cannot even satisfy the force we now have. Yet six new wings will be added in FY 1957. We can expect no expansion of our overseas base system; less dispersal for our overseas forces; limitations on the reserve program because the new fighters need longer runways, and last, but not least, a slowdown of the radar program so essential to continental defense. And at a time when it is vital that SAC be an indestructible force, SAC units must continue to double up on many bases here in the US.

The new budget means that maintenance and operating money, already stretched perilously thin, will have to be stretched even further.

The results are inevitable—cuts in flying hours which in turn affect the quality of combat crew training. We discussed in an earlier issue the effect this is having on front-line units. And with flying hours reduced how can SAC keep a good proportion of its force airborne at all times? One money-saving proposal even suggested that SAC cut its simulated combat missions by two thirds and simulate only the bomb-run on the balance. This surely indicates a lack of understanding of the military requirement.

Under the new budget an impossible manpower situation presents itself. In 1953 the Air Force had 106 wings and better than 977,000 military personnel. In 1957 it is planned to have 137 wings with 936,000 people! If this is possible it will be the greatest feat of legerdemain since Houdini.

Is it any wonder that our newest and best aircraft are grounded all over the country for lack of maintenance personnel? To remedy somewhat this grave manpower shortage the Air Force is forced to use increasing numbers of civilians. But how can this procedure give us the man-in-uniform readiness we need in these troubled times?

The new budget means that, in an era of fantastic technological break-throughs, AF research and development will be maintained at very near its present level, which is equivalent to losing ground in the R&D race.

As the ballistic missile programs, the nuclear-powered airplane and other new defense weapons get farther along they take increasingly large bites out of R&D funds. This can only mean less money to carry on programs that can create new weapons and devices in other fields. It almost surely means severe cutbacks in our efforts to develop the new and faster fighters and bombers we may have to have, to replace the present 100 series, the B-47s and even the B-52s.

The new budget removes the last hope of new equipment for the Reserve and Air National Guard. It means at least another year of "make-do" with obsolete aircraft—and a half-equipped force at that.

In short, the FY 1957 Air Force budget means that the 137-wing program is dead, as dead as the 143-wing program, the 70-wing program, the 48-wing program and all the other programs whose life blood was drained away by the fiscal surgeon's scalpel.

It is unquestionably true, as the President said, that this budget will provide the nation "with the greatest military power in its peacetime history." But shouldn't the comparison be made, not with our previous military power, but with the force that this power may have to overcome?

If the Soviets are having budget trouble, their air force doesn't reflect it.

They outnumber us in B-52 types, they are closing the gap in medium-jet bombers. They outnumber us by thousands in light-jet bombers and new jet fighters.

We realize that numbers of planes are not the whole story. But they are overtaking us in quality as well. As we go to press, we find General Twining issuing a grim warning on this score. He said, "The Soviets are working hard on their Red Air Force and it is getting bigger and better all the time. The growing numbers of modern airplanes in the already huge Red Air Force gives us cause for concern, but numbers alone are not the prime worry. After all, the Soviet Air Force has had thousands more combat planes than we for many years. Our main cause for concern is the rapidly improving quality of the Communist Air Force. It is in quality that we have maintained our lead in the air and our ability to deter war. Quality of airplanes and weapons, quality of bases and equipment, quality of men and training—these have been our margin of superiority. We are not in an arms race in the traditional sense. It has become a race for quality—for better, more effective weapons. Today we are in a good position in this race. Our position tomorrow depends on what we are doing now."

Perhaps the answers to our complacency lie in the blunt recitations of General Ridgway in the January 15 issue of *The Saturday Evening Post*. He said that we are not facing the facts of life from a standpoint of military need. He claimed that our national decisions on defense matters are now based on "... budgetary considerations, on political considerations, on the advantage to be gained in the field of domestic politics by a drastic reduction in military expenditures." General Ridgway was shocked to find that he was not expected to present his reasoned military judgment to the Secretary of Defense. He stated, "On the contrary, incessant pressure was brought to bear on me, seeking to persuade me to make my views conform to a preconceived politico-military 'party-line.'"

There is little question that the present Joint Chiefs are being subjected to similar pressures.

Certainly there is little pressure in the direction of higher defense spending to meet the military requirement. A recent survey by one of the two major political parties tried to discover the key campaign issues for the forthcoming election. Only in one section of the country, the South, was the question of national defense found to be among the top ten campaign issues.

So, I feel we are in the middle of a vicious circle of wishful thinking, fed from the bottom and encouraged at the top. The American people are prosperous and contented. They don't want to think about a hydrogen bomb war. So they tell themselves there won't be one. Their national leaders give them little evidence to the contrary. So the people's belief becomes more firmly entrenched, which in turn causes the national leaders to encourage this belief.

We are squarely in the middle of exactly what this magazine predicted two years ago—an efficient, well-managed, prosperous period of military insecurity.

I am convinced that investigating Congressmen will reach the same conclusion which was reported in the first of this series of budget articles, in the September 1955 issue of *AIR FORCE*.

"We are building a second-best Air Force and gambling that it will never be used. If the gamble pays off we will have saved a great deal of money. If it fails we will have lost everything."

One can only wonder whether Congress—even in this election year—will be willing to share the responsibility for these same grave calculated risks.—END



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FEBRUARY 1956

The Race for The Intercontinental **BALLISTIC MISSILE**

What We Must Do to Win This Race



What If the US Wins the ICBM Race?



What If the USSR Wins the ICBM Race?



What About the ICBM and the Future?



By T. F. Walkowicz

THE RACE FOR THE ICBM

Mr. Walkowicz's analysis of the ICBM race has not been reviewed by either AFA's Policy Committee or the Board of Directors. But we feel these stimulating and provocative views are worthy of the careful consideration of all our readers.—The Editors.

THE MOST deadly race in the history of mankind, the race between the United States and the Soviet Union to develop the first intercontinental ballistic missile, is entering the home stretch. One nation or the other will win. And at the moment it appears that we will have to come from behind, if we are to win. For the Soviets, now chagrined for over a decade at their lack of military freedom of action, lest we unleash our strategic airpower against them, are clearly determined to reverse the strategic balance of power and thus pave the way for world conquest by Communism.

In the hands of a treacherous aggressor, the ICBM can bring hydrogen warfare's threat of extinction to Main Street, and to the doorstep of Farmer Jones, Rural Route #1, USA. In the hands of the United States, the ICBM can deter a potential aggressor by bringing hydrogen warfare to his doorstep, within half an hour, any place on the face of the earth.

What We Must Do to Win

Official and public interest in the ICBM program is higher at this moment than at any time, up to and including the White House. There have been official reports that the ICBM budget is going up, and a good deal of progress has been made by the Pentagon in cutting administrative red tape. Furthermore, the best technical-military-industrial brains in the country have been put to work on the ICBM. Within the conventional military peacetime framework, we are probably moving as fast as possible. But these are unusual times and unusual problems. We are only technically at peace, and the urgency of the ICBM race is overwhelming.

The question is whether the conventional framework, at its best, is not too confining for a project as gigantic, intricate, and expensive as the race for the ICBM. Today the responsibility for our program management is still buried deep in one of the services, at the bottom of several layers of management.

Under these circumstances, the American ICBM program cannot help but bog down. Working at the end of a ponderous chain of command, complete with coordinating and reviewing committees, the men in charge of our ICBM program are inevitably spending too much time hacking through the politico-administrative-budgetary bramble patch above them, valuable time which could be infinitely better spent worrying about the substance of what goes on below them. They are doing a brilliant job,

probably the best that can be done under the circumstances. Perhaps it is time to change the circumstances under which they operate.

It has been laughingly suggested that General Groves would be still trying to justify his 1944 budget, and the American A-bomb would be still unexploded, if the Manhattan District had not been created and if, instead, the military services had each been permitted to develop their own A-bombs "to meet their own peculiar needs" (*sic!*), working through normal administrative channels.

But the Manhattan District *was* created. General Groves was made sole boss of our A-bomb program, subject only to policy review by a top-level War Department-State Department-Congressional Committee. Groves got the best people in the country actually working on the A-bomb program. He got funds in a lump sum, and these appropriations were hidden, to mask our A-bomb progress from the Axis. Groves worked for the President—and, if he had mismanaged the program at any point, the President could have fired him. Groves did not mismanage the program, largely because he was able to spend his full time *running it*, rather than chasing a few hundred budgeteers, bookkeepers, and coordinators.

The Manhattan District spelled the success of the A-bomb program. The A-bomb only helped speed the end of a war we had already won. The ICBM can help us avoid a war we pray we will never have to fight. With our survival literally at stake, we should either let one man run the ICBM program, subject only to periodic review at top level, or we should admit defeat at the outset and put the budgeteers and coordinators in charge, to insure that we are destroyed as cheaply and efficiently as possible.

The ICBM needs a lump-sum budget, not subject to normal budgetary reviews or controls. To a limited degree this is now being done, but the ICBM is still included in the over-all Air Force budget and, with fiscal ceilings being applied by the Administration, any substantial increase in ICBM funding is all too likely to come at the expense of other vital Air Force projects. Furthermore, a separate ICBM budget should be hidden in Congressional appropriations, so that the magnitude of our efforts cannot be easily determined by the Soviets.

We do not need a replica of the Manhattan District to accomplish this. To build a new organization from scratch would only waste precious time. Indeed, the operating framework for an accelerated ICBM program now exists within the Air Force and must be utilized. What we do need is an approach to the ICBM problem of the same scope, magnitude, and singleness of purpose with which we approached the atomic bomb. The best way to do

this, in my estimation, is to pull the policy direction of the ICBM out of conventional channels, and put it in full charge of one man responsible directly to the President for our success in the ICBM race. He should have a technical *advisory* committee of the top scientific talent in the country and he should have a policy *advisory* committee with representation from members of the National Security Council and from both political parties in both houses of Congress. He should have no coordinating committees of any sort *above* him.

This is the kind of action the American people would demand if they knew the facts. This is the kind of action the government, which has the facts, should earnestly consider.

What If the US Wins the ICBM Race?

- All of our problems will not be solved. We will only be buying ourselves some more time.
- Militarily, we will be able to deter the Soviets from beginning an all-out war. Under this shield of freedom, we

must continue to work for peace, and to pray that the hand of God will smite the willful men in the Kremlin, whose determination to impose a godless system of slavery upon the entire world is alone responsible for this terrible armaments race. Meanwhile, the possibilities of erecting an air defense system effective against strategic-ICBM attack will become vanishingly small. True, such a defense may prove eventually to be technically feasible—but it will be incredibly complex and expensive, in comparison with the relative ease and low cost of poisoning several hundred ICBMs for an attack.

- **Defense budgets must go up.** The ICBM will neither be the *ultimate* nor the *only* strategic weapon in the American arsenal. In the beginning, it will take its place alongside the manned bomber. Eventually, just as with all other weapons, it will be replaced. But before the ICBM becomes a full-fledged weapon, we will have to prove its operational reliability. This is primarily a statistical problem. We will have to shoot off many ICBMs in tests and realistic operational exercises, before the ICBM can replace any substantial portion of our air strength. That is why the ICBM, at least for a few years, means higher
(Continued on following page)

A New Approach to Air Age Problems

To see more clearly the need for a fresh approach, let us look at our Air Age problems in broader perspective. First, as the ICBM program gathers momentum and widens in scope, we will see geophysical-research satellite vehicles, ICBM test "shots," and—eventually—manned satellites and space flight become commonplace. In a very real sense, our survival depends upon understanding that all of these things will come to pass, and upon staying ahead of our enemy in all of these arts. Second and simultaneously, more and more of our commerce will move through the air, as turbojets, turboprops, and vertical-rising aircraft make both the long- and short-hauling of passengers and cargo by air more competitive with surface transportation.

The conquest of space for our defense and the opening up of the air ocean for the world's commerce have brought us to the early days of the Air Age. The air spaces are a vast—and vanishing—resource, and to use them properly requires imaginative and sound policy leadership at the very highest levels of government.

The hardware of the Air Age has brought highly complex problems to our doorstep. Our technology has leaped ahead of our understanding of these problems. For example, the Soviet ICBM program has been going full blast for more than ten years now. Yet the National Security Council took no cognizance of our own program until last year. Similarly, the President's brilliant diplomatic coup, his aerial surveillance proposal, kicked around Washington for years before it traveled the tortuous road to the Chief Executive's attention.

As another example, few people know that there are at least four near mid-air collisions on the scheduled airlines in this country each day. There have been more than fifty mid-air collisions in the last few years. Technologically, we could have solved this problem years ago, and we could do it today. But our technology does not get applied and

the air traffic control problem remains unsolved, largely for the lack of a Cabinet-level officer who understands it and who can provide the imaginative leadership needed to solve it.

Isn't it time we had a truly Air Age cabinet member? Must we always build the hardware first, and let its implications go by accident or default? By not understanding the implications of the hardware when it is still a remote gleam in some scientist-airman's eye, don't we risk our very survival by allowing crucial weapons to develop at too leisurely a pace, as has apparently happened in the case of the ICBM?

Whether you're talking about space travel or the smaller, current problem of beating the Soviets in the ICBM race, the answer is abundantly clear for all who wish to see it:

The Air Age is upon us. America must have an Air Age cabinet officer. He must be a real airpower statesman. He must not be another production expert, businessman, banker, or lawyer—with due respect to all of these professions—but an aeronautical statesman, with the kind of scientific-industrial-operational experience in aviation which alone can endow a wise individual with real understanding of this nation's Air Age problems. He should be brought into the President's cabinet now, and initially be given full control of the ICBM and satellite programs.

Creating this vitally needed Cabinet post would not obviate the necessity for the kind of approach to the ICBM advanced in the accompanying article. Rather, it would give the director of the ICBM project a more effective framework in which to operate. He would operate under the aegis of the Air Age Secretary, as General Groves worked under the aegis of Secretary of War Stimson. And the Air Age Secretary would be a member of his policy advisory committee.—T. F. Walkowicz

defense budgets. We cannot safely take ICBM dollars from dollars programmed for manned aircraft. In the long run, a deterrent force built around ICBMs might be less expensive to maintain than one consisting of manned bombers. But we cannot have our cake and eat it. We cannot afford to take the serious calculated risk of cutting back on bombers before we are sure we can count on the ICBM.

• Disarmament policing and inspection will become well-nigh impossible with the advent of the ICBM, if the Soviets continue to refuse President Eisenhower's aerial surveillance proposal. With aerial reconnaissance, coupled with limited ground inspection, the UN could monitor ICBM tests. Such inspection would reveal the construction of underground launching installations. Without aerial and ground inspection of the USSR and its satellites during the next decade, the Soviets will be able to poise, ready for firing, enough ICBMs to destroy all the capitals of the Free World. These missiles will be hidden in underground launching sites which, once they are built, will be almost impossible to detect from either air or ground. Thus, if the Soviets could postpone mutual disarmament inspection

ABOUT THE AUTHOR

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until, say, 1962, the entire Soviet bloc by then might be one gigantic booby-trap.

This is why the President proposed mutual aerial surveillance in Geneva last summer. In effect, we have gone so far in weapons technology that we now have our last practicable chance of initiating disarmament.

• Politically, the Congress should, and, indeed, has announced that it will inquire as to whether we are moving toward an operational ICBM as quickly and as soundly as possible. Fortunately, this Congressional interest and responsibility occurs at a time when men with vast experience in airpower matters are in a position to play leading roles in any Congressional inquiry.

However, this is an election year, and somebody is bound to try to make a political issue out of the ICBM program. And there will be vested military and commercial interests at work also, helping to set the fire beforehand and ready to fan the flames.

Actually, neither political party has clean skirts in this area. In spite of the best efforts of two outstanding Democratic Air Force Secretaries, Mr. Symington and Mr. Finletter, the Democrats kept our ICBM program on the back burner for many years, even when it was becoming more and more apparent that the Soviets were concentrating a major effort on their own program. And the Republicans have wasted precious time trying to build ICBMs with

slogans instead of dollars, even though this Administration has done the great service of recognizing clearly that a major effort is called for.

Let us hope that bipartisan statesmanship will now keep the Congressional inquiry from straying too far away from the essential question of "beating the Soviets to the draw" in the ICBM race.

What If the USSR Wins the ICBM Race?

Mounting evidence indicates that the Soviet ICBM program was begun at full steam immediately after World War II. Scientific and military skepticism caused us to drag our feet. In fact, Convair used its own money to keep the American program alive during the Johnson defense-economy era in the late '40s. Thus, on the surface at least, there is a good chance that the Soviets may indeed come in first.

Some feel that this possibility is of no consequence, so long as we maintain a conventional nuclear air force with "an adequate retaliatory capability." These people admit that if the Soviets have the ICBM and we do not, the strategic balance of power would tip in favor of the USSR. But they wrongly conclude that this shift would not endow the Soviets with a sweeping, decisive superiority.

Some of the arguments advanced to support this view are vaguely reminiscent of the H-bomb controversy. Many who opposed an all-out thermonuclear effort thought that Soviet possession of the H-bomb would not be a serious matter, so long as we could still deliver large numbers of A-bombs on Red targets.

Just as the H-bomb introduced new dimensions of destructive power, so the ICBM will bring a new dimension of delivery capability. If the Soviets win the race, by being able to hit us with ICBMs before we are able to do the same to the USSR, the strategic deterrent will shift to their side. The word *deterrent* is important. We have used SAC's deterrent power to preserve the peace. Likewise, the Soviets could use their ICBM deterrent power to hold us in check, while they leisurely gobbled up all of Europe, Asia, and Africa.

They would never need to attack the United States. Ballistic nuclear blackmail would freeze our present and potential allies into neutralism and inaction. Indeed, Messrs. Bulganin and Khrushchev have already placed their intercontinental missiles on the world's conference table. Is this a "real bet"—or a bluff? If it is a "real bet," and we do not hold the cards to call, what can we do except *be deterred*, i.e., do nothing?

If we do nothing, Soviet infiltration and subversion would see to it that the lion's share of the world's resources—trained people, raw materials, productive capacity, vital real estate for dispersal—would all shift to the Soviet side. The defeat of the United States would then be only a matter of time.

With Soviet ICBMs, armed with hydrogen warheads, poised to obliterate this continent, would the President or Congress trigger a just war to restrain the Soviets? For ten long years of US strategic superiority, we have let the Soviets torment us, exercising the kind of restraint which only comes with national greatness. What if the Communists now reverse the strategic balance and attempt to take over the world? Chances are that we would fight, and that millions of us would die rather than see the world plunged into slavery.

But must we face this eternal decision? Would it not

be easier to avoid letting the Soviets get stronger than we?

"The most powerful Air Force in peacetime history" is a nice slogan. But what we need, if we are to continue deterring the Soviets, is *better* nuclear weapons, *better* aircraft and missiles, than those of the Soviets, and *more* weapons, aircraft and missiles than the Soviets possess. In short, we need the world's Number One Air Force. As part of this need, *we must beat the Soviets in the ICBM race*, or the lights of freedom will begin going out all over the world.

What About the ICBM and the Future?

The beginning of the next decade may see the world facing two potential sources of destruction. One will be in the hands of a President whose country adheres to an ideology which repudiates beginning an aggressive war. The other will be in the hands of an unpredictably volatile despot, whose aims of world domination become more clear with each passing day. What are the implications of this situation, however dimly they can be perceived at this stage?

What will happen if we let the Soviets beat us in this deadly race? Can we expect New York or Washington one day to go up in flames and violence without warning, simultaneously with a Soviet demand for the surrender of the Free World? This may sound like fantasy, but no one can now say with the necessary assurance that the Soviets will not successfully develop the ICBM, or that, having done so, they would dare not use it. After all, thus far they have not had the air strength to try hitting us with conventional bombers, but why not with the ICBM? Or perhaps the Soviets will be just a bit more subtle, and arrive at the next Summit Conference sporting their brand-new ICBM shoulder holsters, and purring suggestions that the US cooperate in "relaxing tensions," while France goes today, Italy tomorrow, and Africa the day after.

What should we do if we win the ICBM race? We could boil the waters of Lake Baikal, and call for the peoples enslaved by Communism to rise against their masters. Or, we could just sit and wait, praying for an act of God, while the rim of Churchill's hell, around which humanity wanders, becomes only narrower and more slippery, even as the hell itself grows hotter.

What can our statesmen do in the few years still remaining before all of this comes to pass? How can the ideological struggle with Communism be brought to a grinding halt in freedom's favor, without precipitating an all-out nuclear war? How can the underdeveloped nations be lured away from Communism's empty promises? And how can the Soviets be induced to accept both nuclear and conventional disarmament, before man's tinkering with the forces of destruction dooms us all?

How can the Soviets be induced to ring up with a bang the Iron and Bamboo Curtains, and let their peoples see the world as it is, rather than as they would have them believe it to be?

These are the problems which tax the courage and the imagination of the Free World's statesmen. For the hyper-sonic crack of an ICBM carrying a multi-megaton warhead has done more than bring new dimensions to warfare. It has also narrowed down the time available for peaceful solution of humanity's basic problems.

This is the situation the world's leadership must cope with, and this is the world of incipient cataclysm—and great challenge—in which we were all born to live. We soon face either the dawn of mankind's brightest era or, if we fail, destruction and darkness which may leave the planet and whatever follows us on it "beyond repair."—END

LEAD TIME AND MILITARY STRENGTH

(From a speech by Rear Admiral H. G. Rickover, USN, in Washington, D. C., January 12.)

[Today] there are only two major military powers. If a world war breaks out these two will be engaged, and there will probably not be time to develop countermeasures against a new potent weapon.

This is the reason why lead time is of such great importance today—why the nation with the lowest lead time has the advantage.

It seems that the Russians have been able to cut their lead time considerably on important items; this is borne out from public displays in the annual air shows over Moscow.

This reduced lead time under the conditions of present day invention and technology constitutes use of the gravest long-range threats to the security of the Western World. And this is why this problem should be of great concern to all of us. . . .

Our scientific discoveries will no longer be of particular advantage to us if the enemy develops them faster than we do. We have known for several years that our scientific training has been deteriorating and have done little about it.

The first step we must take is to improve the technical and scientific training of our young people. We are faced with a national problem of the first order and nothing less than an overriding effort by all of us will meet it. There is no lack of knowledge of what must be done. Profound studies have been made on the subject and much has been said about it. But so far little has been *done*. . . .

The second step which we must take is to speed up design and development of military goods. This may have to be done by cutting down the delays which stem from too much review, too much coordination, or too many overhead people. . . .

The money we try to save by checking and counter-checking, by being too careful not to make mistakes, is frequently offset by the lengthening of our lead time. Time, after all, is money; but time today is more than money; it is our margin for survival. . . .

As individuals and as a nation we have to ask ourselves this question: Is the Soviet Union a serious threat to our survival? If the answer to that is "Yes," then we must ask ourselves this second question: Is the nation doing all that it can and all that it should to turn back that threat? If the answer to that is "No," then I submit that something is wrong with us and that we are in trouble.

One final thought: You know that there can be no second place in a contest with Russia and that there will be no second chance if we lose. But if we lose, it will be largely by default. It will be because we have acted without vision, because we will have wasted the marvelous ingenuity and fine spirit of the American people in providing us with things which make life more pleasant but which really do not matter much if they are bought at too high a cost.

In NATO's Air Defense

Chain, the Swedish

Air Force Is . . .

THE MISSING LINK

By Björn Karlström and Michael Gladych



A hangar for Sweden's "underground air force" being dug from bedrock. Fighters are already using hangars like this one.

Photo courtesy the American-Swedish News Exchange, Inc.

THE expanse of the snow-blanketed airfield ends abruptly under a wall of granite hills. The hardstands are empty and the squatly barracks silent. A flock of birds chirps merrily in the nearby pines. Then, a low buzz disturbs the silence. The granite wall parts—gapes in a low, rectangular slit. The blast of jet engines trails two stubby, arrow-winged fighters that shoot out of the hill, whipping up a tornado of ice crystals. The planes nose into the Swedish winter sky and vanish. When the snow settles, the slit in the rock is gone and all is quiet again except for the cautious calls of the returning birds.

But deep under the snow-covered rock, in the Fighter Operations Room of the Royal Swedish Air Force, a loudspeaker crackles a message from the two fighters, now far over the Baltic Sea. In the underground hangar, two more pilots climb into their planes. Mechanics plug in the starter and intercom cables, and two tractors clank their tow bars in place, ready to "surface" the planes should another alert bell ring. In the safety of 500 such hangars, maintenance shops, factories, and command nerve centers, the *Flygvapnet*—the Swedish Royal

Air Force—is ready to scramble its 1,200 jets at a moment's notice.

Flanked by NATO Norway and NATO Denmark, Sweden has officially remained outside of the western mutual defense system. Yet, paradoxically, Sweden is NATO's ace-in-the-hole. In Western European military circles, Sweden is regarded as a formidable bastion.

Compact, modern, and efficient, the Swedish Air Force is one of the youngest in the world. Following the Versailles Treaty of 1918, the entire Swedish military machine was scrapped. Sweden aimed to remain at peace with the world—even with her traditional enemy—Soviet Russia. Thus, for eighteen years following World War I, Sweden's defense was limited to so-called "neutrality patrols"—token infantry and naval forces.

But Hitler and the growing strength of the Soviet Union spurred the peaceful Swedes to a defense effort. Starting from scratch in 1936, the Swedish Navy, Army, and Air Force were organized—each as an autonomous force. Within a ten-year rearmament plan, Sweden built guns and ships and sprouted powerful wings for its AF—now the fourth strongest in the world.

The concept of Swedish airpower is a miniature of our own, except for an extra accent on defense. Over her area (slightly larger than California) Sweden holds a shield of one night and ten day fighter wings. Her sword is the striking force of four fighter-bomber attack wings. Throw in one reconnaissance wing with airborne DEW radar, an air-sea rescue squadron, and the flying schools and there you have it. But if you consider that the heart of Swedish industry is only thirty jet minutes from the advanced Red bases, you'll see that the Swedish Royal Air Force staff faces a tough problem.

The man who would beat the Reds to a lightning punch is soft-spoken, fifty-eight-year-old Lt. Gen. Axel Ljungdahl. If you saw him at his peaceful hobby of ornithology, watching birds and learning their habits, you might take him for a harmless university professor. But in uniform, his service cap tilted rakishly and his mouth set into a firm, thin line, he is a rough and tough Nordic replica of our own Gen. Curtis LeMay. A pilot since 1921, General Ljungdahl is likely to fly his jet fighter for a surprise

(Continued on following page)



Lt. Gen. Axel Ljungdahl is the Chief of the Swedish Air Force.



Supreme Commander of Swedish Armed Forces is Gen. Nils Svedlund.



In one of the Swedish Air Force's underground rock shelters, a J-28 Vampire trainer is attached to a jeep which will tow it out to the starting runway.

Photos courtesy the American-Swedish News Exchange, Inc.



One of the better new planes now rolling off Swedish production lines is the SAAB-32 *Lansen*, in the same class with our Lockheed F-94C Starfire. Its Swedish-built RM-5 engine and afterburner give it speeds "well over 700 mph."

inspection of an air force base in the morning—that same afternoon you find him hard at work at his Stockholm headquarters, talking over improvements with his staff.

Responsible directly to the Supreme Commander of the Swedish Armed Forces, Gen. Nils Svedlund, General Ljungdahl keeps tabs on his Air Force through the Air Force Command. In it are men of the Royal Swedish Air Board, Air Observation Service, Technical and Safety Service, Medical Service, and the Air Staff—the brains of the *Flygvapnet*.

The brawn is on the twenty-one air bases. You see de Havilland Venom J-33 night fighters, perky *Safir* Sk-50 trainers, J-28 Vampire jet trainers, and J-29 Flying Barrels. Laden with bombs and rockets, boasting four cannons for high-altitude interception or pregnant with six aerial cameras, the J-29 is the backbone of the SAF.

Powered by a D.H. Ghost centrifugal turbo of 5,000 pounds thrust, the J-29A hot tails at about 500 mph—no strain, and in emergency can push up the airspeed indicator needle to 660. It is a single-seater with a comfortable cockpit and excellent field of vision. Its blunt snout houses four twenty-mm. Bofors cannons.

Designed primarily as a day fighter, the J-29 is a quick-change artist. Loaded with fourteen 5.5 rockets under its wings, it doubles as a ground attack plane. It also triples into a fast photo-reconnaissance ship with a battery of cameras in its belly.

"It's an old plane," says Squadron Leader Evert Bage of the Royal Svea Fighter Wing. "But it's wonderful—it's a steady gun platform, can fly hands off, zoom like a rocket, and as for landing, well, you have to try it yourself to believe." Still, the J-29 is eight years old and the Swedish Air Force is due for something better. So while the *Scenska Aeroplan Aktien-*

bolaget—the SAAB—tested more advanced types the old J-29 was revamped and brought up-to-date.

The new series currently delivered to all day fighter wings is the F model. Still powered by the same engine, the J-29F sports a Swedish-designed and -built afterburner. The extra 2,000 pounds of kick doubles its rate of climb, boosts the level speed and the ceiling. The outer wing panels have been redesigned to give the plane even better stall characteristics and raise its critical Mach number.

How does the J-29 compare with, say, our F-86? Capt. Anders Erik Westerlund, the thirty-two-year-old squadron commander of the Royal Upplands Fighter Wing, will tell you his J-29 is better. On May 6, 1954, Captain Westerlund beat Miss Jacqueline Cochran's Sabrejet record of 590 mph over a 500-kilometer closed circuit by seventeen mph.

Capt. Hans Neij of the Reconnaissance Wing at Nyköping broke another world speed record with his J-29C on March 23, 1955. Scooting along a 1,000-kilometer closed circuit, Captain Neij and his wingman Birger Eriksson averaged 559.6 mph to better the existing record by thirty mph. "The J-29 is a first-class aircraft," said Captain Neij.

And better planes—also of Swedish design and manufacture—are already rolling off the production lines. The first to come will be the SAAB-32 *Lansen* or *Lance*. Spanning forty-two feet, eight inches with its thin, laminar-flow wings swept to thirty-five degrees, the *Lansen* is a two-seater attack plane. In the same class as our Lockheed F-94C, the *Lansen* weighs only 20,000 lbs. Its RM-5 Swedish-built axial engine with afterburner delivers 9,500 pounds of static thrust and gives the *Lansen* a top speed of well over 700 mph.

Although primarily intended for



Swedish AF Capt. Anders Westerlund who set a speed mark of 607 mph on a 500-km. closed course in his J-29.

ground-target attack with cannon fire, bombs, and rockets, the *Lansen* is already groomed for other jobs. Equipped with radar and air-to-air guided missiles, a version of the *Lansen* will replace the J-29 in some of the day and night fighter squadrons. Another model is being fitted with dual control system for training junior Vikings.

Quite unlike the ugly J-29, the *Lansen* is a thing of beauty. The long nose housing radar gear and the two flush air intakes make it look the speedster it is. Back in 1952, during its development flight test stage, the *Lansen*, with SAAB Chief Test Pilot Bengt Olow at the controls, pushed the machmeter needle well through #1 in a shallow dive.

But the *Flygvapnet* needed something hotter. So, the obliging SAAB has come up with the revolutionary, 1,000-mph *Draken* or *Dragon*. Already in flight test stage, the SAAB *Draken* (J-35) is a dural-and-magnesium dart.

Fully loaded with radar, a new Swedish electronic gun sight, thirty-mm. cannons, and air-to-air guided missiles, plus fuel, the *Draken* weighs only about 30,000 pounds. The thrust of the new version of its axial-flow Avon with afterburner is still a secret, but rumor has it in excess of 10,000 pounds.

The Mach 1.5 *Draken* is expected to be in squadron service within a couple of years.

The men who fly and service the

Flygvapnet's planes are mostly career officers and NCOs. Since military service in Sweden is compulsory between nineteen and forty-seven years of age, there are also a number of the so-called "Short Service" pilots—all NCOs. "Short Service" means six to seven years. Before becoming a pilot, a "Short Service" man goes to a Training School to get ground courses backed by the general knowledge he will need in the squadron. He is then taught to fly and fight, with his gunnery and tactics given a final polish at a first-line squadron. If he is tops, he can be recommended for the officer's grade. Back to school he goes—this time the Swedish Royal High School. More general subjects, more military knowledge to make him come up to the high standard of every Swedish Royal Air Force officer.

At this writing the SAF has about 1,200 officers in staff, flying, radar, maintenance, and other jobs. The "Short Service" pilots, technicians, mechanics, armorers, and other ground personnel number about 4,000. In addition, approximately 6,500 civilians are in clerical and technical jobs.

The flight training has been recently revamped to provide for a rapid expansion of the Air Force in case of war. Flight and ground training is given in the Air Force Central Training School at Ljungbyhed. The cadets start their flight training in the Sk-50, otherwise known as SAAB *Safir*. This three-seat, 2,300-pound plane is powered by the 190-horsepower Lycoming engine. All metal, complete with retractable tricycle landing gear and landing flaps, the Sk-50 provides a good introduction to flying. After some fifty hours of dual and solo in the Sk-50, plus fifteen hours dual instrument flight, the cadets graduate to the dual control J-28C—a jet trainer. In eighteen hours of jet dual, they qualify for the J-28B—a single-seater de Havilland Vampire fighter.

Now, the program is intensified—twenty-five hours of familiarization, twenty-four hours of instrument flying, eighteen hours of formation, twenty-two hours of cross-country and navigation, topped off with twelve hours of advanced flying—aerobatics, emergency procedures, and tricks of high-speed combat. The next step is a J-29 line fighter, attack, or reconnaissance plane.

This training scheme was first tried in 1954. The eight "Short Service" pilots who served as guinea-pigs graduated with honors, and the shortcut from a light plane to jet has been

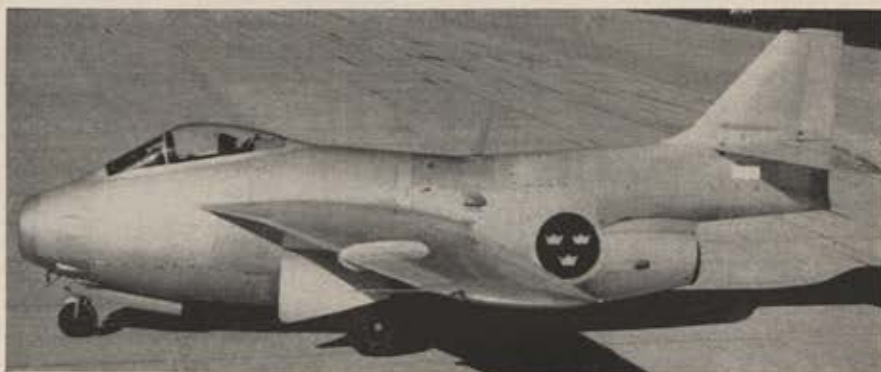
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Emperor Haile Selassie and some of his officers review the Imperial Ethiopian Air Force at an air meet outside the capital, Addis Ababa.

HOW SWEDISH EXPERTS AND AIRCRAFT HAVE HELPED CREATE THE ETHIOPIAN AIR FORCE

SWEDEN'S air activities in recent years haven't been confined to her own borders. Swedish experts have helped Ethiopian Emperor Haile Selassie create a small but efficient air force, one especially adapted to the geography of that country. It now has four attack squadrons and a training program that turns out about twenty new pilots a year. In prospect are a recon squadron and a jet squadron for the defense of Addis Ababa, the capital. The new Imperial Ethiopian Air Force (IEAF) dates back to the 1930s when, during the Italian invasion, a Swede, Count Carl Gustaf von Rosen, organized what is believed to be the first wartime Red Cross air transport service, as part of the Swedish Red Cross expedition to Ethiopia. He oversaw the building of a new airfield at Bishoftu, thirty miles from the capital. Today this field is the site of all IEAF training and houses probably the best equipped aircraft repair center in East Africa. In building the IEAF from next to nothing, Count von Rosen first replaced several ancient biplanes with modern Swedish Saab-91, three-place trainers. Since 1947 the IEAF's mainstay has been its nearly seventy 270-mph, single-engine Saab-17 attack planes, whose short take-off characteristics suit them well to Ethiopia's high-altitude, rough airfields. The inventory also includes a smaller number of British Fairey Firefly attack fighters, some Saab-91B *Safir* trainers, and a number of Douglas C-47s and de Havilland Doves in a twin-engine transport unit.—ENP



SAAB's J-29 Flying Barrel (the F model is shown here) with its bulging belly is a clumsy-looking brute that hugs the ground as though afraid to fly. But when you watch it take-off and climb, you apologize for any unkind thoughts.

adopted as standard training procedure.

Although the *Flygcapnet* has no combat tradition as a force, some of the SAF pilots joined the Finnish Air Force during the Russo-Finnish war in 1939-40. Finland lost the struggle, but the Swedes did well. For every Swedish plane lost in combat, down went twenty-two Red planes. The SAF pilots who have never had an enemy aircraft in their gun sights think they could do as well.

"If we didn't believe we could defend our sky," said a thirty-year-old squadron commander, "we would not bother to have any air force at all."

"Sure," chipped in a young pilot. "We can take care of ourselves, especially if the NATO countries put up a fight."

borne radar. A fleet of twin-engine S-18s fitted with search radar patrols offshore in relays to gain valuable approach warning time.

Stockholm is only thirty jet minutes from Red bases on the other side of the Baltic Sea. So Swedish radar deals not in hours, but in minutes. Some Swedish Air Force men call their radar system obsolete. However, the existing set-up can give an approach report in fifteen seconds. It takes exactly ninety seconds more to scramble two J-29 fighters from an underground hangar—only thirty-five seconds from a surface field.

Underground fighter readiness rules are very strict. Pilots on alert duty are strapped in and ready to take off. They can talk to the fighter controller in the Operations Room by an inter-

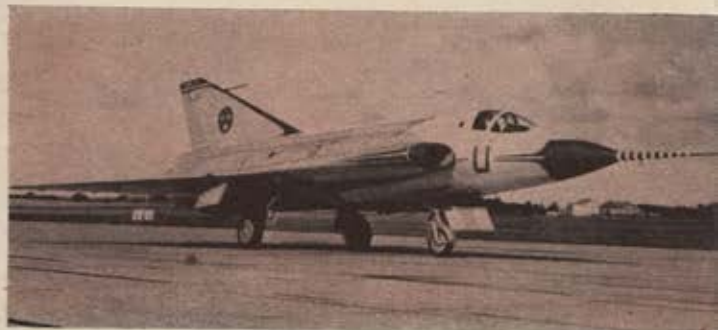
WAFs shoving the plots by hands, they will have electronic plotters. The D/R operators calculating the enemy's speed are replaced by automatic computers. And TV screens will give each command post the whole situation at a glance.

SAAB, Sweden's only aircraft factory, was organized in 1936 as a stepchild of the gun-making Bofors firm. With its main plant at Linköping, the SAAB has dispersed its other plants and extensions. The first result of SAAB's labors was a dive bomber which hit squadron service in 1941—only two years after its conception. Next came the SAAB-18—a twin-engined light bomber. Then, the 400-mph pusher fighter, the SAAB-21, and in 1946, the first J-29 Flying Barrel.

(Continued on page 45)



The Sk-50 *Safir*, whose top speed is 170 mph and range is 680 miles, is used for basic flight training. A Dutch factory now makes Sk-50s under sub-contract from SAAB.



SAAB's J-35 *Draken*, "double delta" all-weather fighter. Its rakish 78° sweep permits fuel storage in wing's center section, while outer wing panels are thin as swords.

"If they depend on NATO for tying up some of the Red Air Force, why don't they join it?" you might ask. The answer lies in a ticklish political situation. The Swedish Staff sees Finland as an important geographical buffer. In an unwritten warning, the Kremlin intimated that if Sweden joined NATO, the Red Air Force would move into Finnish bases. Then, even the best radar would not give enough warning to scramble. But with a neutral Finland on her northern flank, Sweden's radar is still effective.

The radar and visual warning systems come directly under the jurisdiction of the Swedish Air Force Command. The early-warning and fire-control radar net in Sweden goes back only six years, but within that time the Air Force Air Observation Service has done a good job. There is a long-range radar early-warning net along the coastline and the Swedish-Finnish border. Aircraft Observer Posts are spotted throughout the country to fill the gaps in the radar net and to serve as an important reserve should some parts of the radar system be knocked out. This is further supplemented by the Distant Early Warning by air-

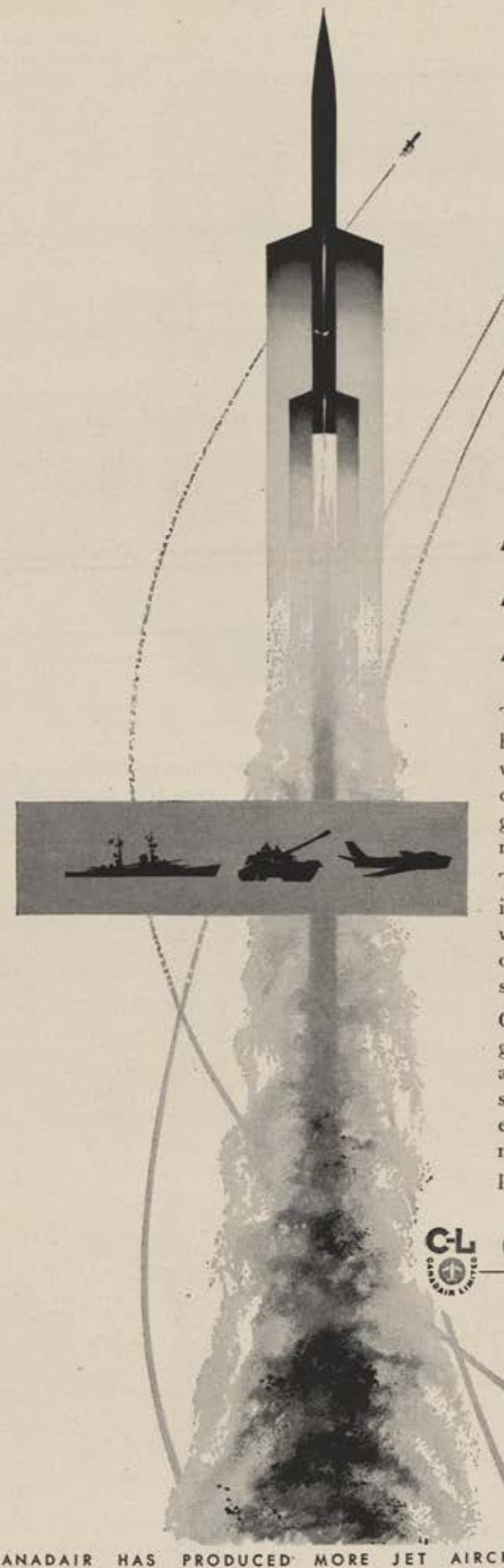
com plugged into the planes. At a red alert, powerful tractors tow the ready planes to the runway. The tractors carry starter units for the jets and the engines are started en route. On the surface, the tractor crews drop the tow bars and scoot out of the way while the jets take off straight ahead.

Each underground base has accommodations for pilots, briefing rooms, operations and maintenance, as well as hangars. The "sitting-in" tour for the alert pilots is two hours. Apart from that, they can rest in the air-conditioned comfort of their A-bomb-proof granite shelter.

The radar service is largely operated by women—the counterpart of our WAF. They are all volunteers, though, and the expanding Swedish Air Force radar can't get enough of them. To remedy the shortage of radar operators and experienced plotters, the Swedes are turning to automation of all possible phases of their warning net. Experts are working on automatic transmission of plots from advance radar stations to filter stations and command posts. Instead of the present plotting tables at the Sector Fighter Control rooms, with comely



Squadron Leader Evert Bage goes over some of the fine points of camera gun pass techniques with his pilots in the Royal Svea Fighter Wing.



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The development of guided missiles of every type is becoming one of the most competitive areas in our world today . . . for supremacy in this field can well determine peace for many years. The race is now for greater speed, higher altitude, longer range, more sensitive control.

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Canadair has long had a prominent role in Canada's guided missile program, applying the knowledge acquired in years of experience in advanced aircraft systems engineering . . . and Canadair's research, engineering and manufacturing resources are constantly making further important contributions to projects in this field.



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After Hiroshima, Sweden began building underground factories. This is a SAAB Aircraft Co. parts and tool room.



Workers at lathes more than 100 feet underground turn out aircraft parts for SAAB Aircraft Co., Linköping, Sweden.

And in 1945, impressed by the Hiroshima devastation, the SAAB began to build underground manufacturing plants.

While the Swedes don't mind voicing their pride in the SAAB, there is one question that makes them clam up—guided missiles. "Yes, we have them," they say. "We must keep up with our neighbors." And that's the extent of the conversation. However, there are underground sites for ground-to-air missiles and the newer Swedish fighting planes do have provision for air-to-air guided rockets. Also, there is a Guided Missile Office within the Air Force Command. The Swedes wisely believe that the Air Force is the most qualified of all three services to handle the ticklish "bird" problems. In fact, with an exception of the artillery-spotting small aircraft (Fieseler *Storch*) neither the Swedish Army nor Navy has any air arm of its own.

Questioned about this Air Force monopoly, a Swedish naval officer gave a simple answer: "It's easier to teach a jet pilot to work with the Navy than to train a naval officer and then teach him to fly." And as to the guided missiles for the warships, he said, "Of course, we'll fire them from our decks, but it's up to the *Flygvapnet* to see that the missiles we get can do their job in the air."

So, the Swedish Air Force pilots learn to cooperate with their Navy and Army. True, they have the added burden of learning ship recognition, strafing and bombing anything from a sub to a battlewagon, or knowing how to silence a field gun position and give close support to ground units. But they take such duties in their stride. "It's a part of our job," they say. And the Army and Navy liaison officers at the Air Force Command know as a result of frequent maneuvers and joint exercises that the

Flygvapnet will not let them down.

Swedish Air Force cooperation extends also to the NATO countries. Of course, there are no official agreements, but all Swedish planes carry the common NATO frequency in their VHF sets. Swedish formations "visit" NATO airfields—the distant Turkish bases included. The SAF control towers find the NATO standard plotting boards "very handy" and since the Swedish planes use the NATO frequency, the towers use them, too.

Yes, the Swedes can make themselves understood in their sing-song English, although sometimes they get a bit confused. A formation of J-28A Vampire jet trainers took off from their Uppsala training field on a cross-country visit to Holland and France. Near the overcast Hamburg base, two of the Swedish cadets ran low on fuel, so the leader of the element contacted Hamburg tower for landing instructions.

The tower responded with a barrage of questions. What are your flying conditions? Are you on top? VFR or IFR?

The Swedish cadet leader was at a loss. His Vampire flew fine. His wingman shrugged, evidently puzzled. The leader pressed his transmit switch. "My flying conditions are fine. Except we're low on fuel. Over."

The puzzled tower operator gave the Swedes landing instructions and the two Vampires glided in smoothly in spite of the drizzle and 0.1 mile visibility and 200-foot ceiling. Refueled, the cadets were ready to take off when the British tower man demanded to see their instrument tickets. "That's all we have," said the cadets, producing the Swedish equivalent of an identity card.

(Continued on following page)

A 5,000-pound-thrust Ghost engine is readied for installation by mechanics.





XC-123A



C-123B



XC-123



XC-123D
(BLC)



PANTOBASE
MS-18
(YC-123E)

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WATER OR ICE,
PLOWED FIELD
OR COW PASTURE

We Land with Big Airplanes
Where even Little ones Can't Go

Stroukoff
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WEST TRENTON



NEW JERSEY

MISSING LINK——CONTINUED

Not knowing a word of Swedish, the Hamburg official okayed the take-off. The two young Vikings climbed into their jets and soon roared happily into the drizzle.

Drizzle or dazzle, the Swedes are ready, and their Air Force keeps developing its supersonic muscle. To see how healthy the SAF growth is, let's look at the figures. In 1939, the SAF had only 300 planes and a total defense budget of 276 million kroner (approximately \$55,500,000). At the



An indication of Swedish cooperation with NATO—control towers in Sweden use the same plotting board that is used in Europe by NATO countries.

end of their ten-year rearmament plan, they doubled the number of planes. Today, the SAF has 1,200 combat planes. The Swedish defense budget for 1955 is 2,163 million kroner (approximately \$432,600,000), and the projected figure for 1965 is 2,476 million kroner (approximately \$495,000,000). The average slice of the defense kroner for airpower is about forty percent. Never a cut in the appropriations or the number of planes, but a steady expansion—not a bad record for a peaceful nation of only slightly more than 7,000,000 people. With her back to the granite Kjölen Mountains and her eyes on the sky stands Sweden—the “missing link” of the NATO chain, but one of its *strongest* points. —END

ABOUT THE AUTHORS

Mike Gladych last wrote for us in May '55 (“ADD Is SAC in Russian”) and March '55 (“New Red Fighters”). An experienced pilot, he flew with four Allied AFs in WW II (Polish, French, British, and US). Björn Karlström makes a living in Sweden as a freelance commercial artist. He's been interested in aviation since he was a boy and “knows almost everyone in the Swedish AF.”

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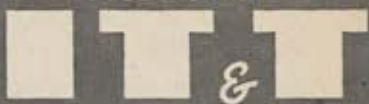
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RADIO CORPORATION OF AMERICA
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What I Believe About American Airpower'

If you missed the Godfrey views on airpower in his recently published memoirs, here's a chance to catch up

BY NOW a great many of you have read Arthur Godfrey's strong views on American airpower, or our lack of it, in "The Saturday Evening Post" for December 24, 1955. We think the pertinent portion of his memoirs, however, deserve a second reading—certainly a first in case you missed it first time around. And we think a pretty good introduction to these excerpts is the following editorial in the Phoenix (Ariz.) "Republic":

A great many Americans doubtless have read that Arthur Godfrey, a radio and television master of ceremonies, ukulele player, and wit, has taken the country to task for the state of its air defenses in an article written for The Saturday Evening Post.

The general reaction will be two-fold. The folk who listen to Mr. Godfrey's homilies over the air will accept his words as gospel. The remainder of the country will be apt to think there is no end to the gall of a successful actor.

Our first reaction was just that. Why should this gent, Godfrey, think he knows enough to tell the leading military minds of the nation that they are out in left field? Or was he paying off his friends in the Air Force for past favors?

So we read the article in the Post.

Mr. Godfrey denies he made the statement that our air defense set-up was outmoded and ill-equipped because of friendship for anyone. He denies that he made it because he thinks he knows more about the situation than the military men. He says he made it because he investigated the situation and established the truth of his statements. But, forgetting the reasons that led Mr. Godfrey to make his statement, let's get down to the fact that he did.

There have been rumors for some time that all was not as it should be in our defenses. Tales drifted around to the effect that Russia actually had as good planes as our best and had more of them. These stories didn't all come from Arthur Godfrey or from various friends of his such as Gen. Hoyt Vandenberg or Gen. Curtis LeMay. They came from stray congressmen, interested citizens, from all over the map. But the important thing is not where they come from or why, but are they true?

Mr. Godfrey suggests that there be a public investigation. Now regardless of how much or how little the radio and TV actor knows about military matters or why he made his statement, that point is sound, solid common sense. The people of the United States should demand that a full report on the state of our air forces be made and that, if there are weaknesses, corrections should be begun immediately. Enough of rumors. Enough of reports by individuals. Let's have the facts presented by a group whose word and knowledge are above question.



Here are the Godfrey views the Republic referred to:

Here and there in these memoirs, I have mentioned my love affair with aviation. It is an affair in which I take genuine pride, because it gives me a chance to do something tangible for my country—this America that I love so deeply. This is the task I had in mind when I said, in an earlier chapter, that I expect to continue in broadcasting for a while longer because I have a job to do. I've been working on it for some years, but it is still far from finished.

The job is simply this: I want to help inform the people of this country about America's desperate need for airpower—now! I believe that because of our failure to understand properly the modern meaning of the term "adequate airpower," we are gradually reaching a dangerous and untenable situation.

I am aware, of course, that most folks think they already know about airpower. If you ask the average guy in the street whether he's for airpower, the chances are he'll say, "Why, sure!" And if you ask him, further, whether he thinks we've got it in this country, he'll say, "Yes, we have." He votes for it and he thinks he's getting it. But the tragic fact is that we are not getting it—at least, not the right kind and not quickly enough. . . .

And I now firmly believe that the Russian Communists would long ago have overrun all Western Europe but for one thing: their completely justified fear of SAC under General LeMay. Sure, no man is indispensable, and someday Curt will retire, but through his foresight and ability to organize and train, there will be others to take over. And the fact remains that LeMay will go down in history as the one man who had the vision and the understanding and the know-how and the sheer guts to whip SAC into shape at the crucial time when it was so desperately needed. That time was every moment of the past five years, and will be every moment of the next five—at least.

Some of my badly misinformed friends had told me that the B-36 was such a monstrosity that the crews manned them only at gunpoint, that they often mutinied rather than take off in one, that they were rarely able to get them into the air, that the planes were slow and cumbersome, and so vulnerable to fighter attack as to be absolutely useless. You may think this sounds fantastic, and it was. None of it is true.

To be sure that I could speak authoritatively on these matters, I flew B-29s, B-50s and B-36s. Then I went to Wichita and flew the then-new B-47 all-jet medium bomber—which since that time has replaced all of SAC's B-29s and B-50s. I had once been told by a Cabinet officer that it cost \$18,000 for JATO—jet-assisted take-off—alone to get a B-47 off the ground. Yet I took that ship

(Continued on following page)

Some Responses to Mr. Godfrey's Views

Our Policy Committee has reviewed carefully your article in The Saturday Evening Post for December 24. The Air Force Association shares your concern that the American people are inadequately informed about our military situation. We believe that your enlightened and courageous stand on the airpower issues of the day will help to generate the thinking and the action necessary to remedy this situation. It is ironic indeed that thirty years ago another believer in airpower was court-martialed. History has put the stamp of approval on Billy Mitchell's views. We believe it will put the same stamp on your vigorous airpower thinking as expressed in this magazine article.

Gill Robb Wilson
President, AFA

Your statements in the current Saturday Evening Post on the desperate need for adequate American airpower deserve the attention of every American.

In my opinion, your views represent sound and enlightened judgment on issues vital to our survival. Balanced budgets and hoped-for tax cuts may be possible but cannot be given precedence over adequate national defense. The basic requirement for our security is airpower. Although the majority of the American people favor adequate airpower, there is much confusion as to what the term implies.

The overwhelming threat to our survival is the build-up of Soviet long-range nuclear capability. The only answer to this threat is American supremacy in the air, which is primarily our own long-range strategic capability. Our past and present strength in this respect is being seriously threatened by the continuing Soviet build-up of their strategic air potential.

Your article will, I hope, open the eyes of millions to these cold and unpleasant realities.

Carl A. Spaatz
General, USAF (Ret.)

I note you admit that you are not a "military" man but we should all realize that clear thinking, logical analysis, and correct deductions are not attributes that are the sole property of military men. In addition, in warning this country of the dangers involved in allowing our air defenses and our striking forces to fall behind those of the Soviet Union, you bring to the subject an intimate knowledge of aviation. In this age of A- and H-bombs, when the fate of a nation can be decided by the results of an opening air attack, we cannot afford to neglect our airpower or be lulled to sleep by Red smiles. You are performing a patriotic service to the American people in informing them and warning them of the perils of our present position. I sincerely trust that you continue to carry on this work. If all of us do not see the handwriting already on the wall and heed those warnings, there is a real danger that this country as we know it will cease to exist.

George C. Kenney
General, USAF (Ret.)

off the field at Wichita, climbed to an altitude of almost eight miles, approached a speed of Mach .9 and landed without ever using anything but the throttle.

The B-36 is also quite an airplane. Perhaps it is big and cumbersome as modern aircraft go, but it has a lot of virtues, including the fact that it has the lowest accident rate of any of our bombers. It flies very high, having an effective operational altitude higher even than some jet aircraft, and it has such tremendous firepower that it can be a highly dangerous proposition for attacking fighter planes. Yet the plain fact is that the B-36 should have been patted affectionately on the fanny long ago and retired. It is obsolescent, and has been for some time, but it is the only intercontinental bomber we have in quantity, and we'll have to make do with it until we get the B-52s we so urgently need. And there is the rub. The best and most efficient bomber we have today is the remarkably fast, long-range, nuclear B-52. The vexing problem is that the number in actual service is so small as to be pathetic, and at the rate they are being produced today it will be twenty-four years before we have the number required to provide the minimum protection this country must have. Are you shocked? I hope so.

We actually need something like 1,200 B-52 jet bombers in our offensive striking force. These aircraft, with their crews of six highly trained men, can carry and deliver the modern nuclear weapons with deadly accuracy, and they can fly where they have to go and get back. In the face of such a force—which, incidentally, wouldn't cost more than \$10 billion a year to maintain—no enemy in his right senses would dare provoke a war. And that, of course, is what I'm talking about, what I'm crusading for—a powerful striking force to keep the peace. We don't want war. We want a striking force so awesome that there won't be any war.

But we also want to be ready if some power-mad dictator takes leave of his senses and decides to conquer the world, including us. Let's be more specific. The current friendlier attitude of the Russians shouldn't fool anybody. Soviet Russia is still a deadly and constantly threatening danger to our country, and that danger is pinpointed in the Soviet long-range bomber force. Unquestionably, the Soviet is building intercontinental bombers faster than we are. They couldn't possibly have got as many into the air as they did last May Day unless their program was well advanced. Remember how fast they built all those MIGs? And now, to show you how smart they are, they're junking their MIGs.

All the Russian Navy and 1,000 divisions of Russian foot soldiers—if they had them—couldn't hurt our homeland, but one even inaccurately placed nuclear bomb could make rubble of New York. A Russian air attack could so cripple and devastate this country that it might never rise again, and we couldn't stop the attack once it was launched!

The next major war, if we have one, will open with a battle of long-range bombers, and we must be able to get the upper hand in this battle, fast and conclusively. Our first targets must be the enemy force that can bring atomic bombs to this country. We must smash at it with everything we have, wrecking their air bases, their combat airplanes, their atomic stockpiles, their whole capacity to make air war upon America. We must prevent as much of their bomber force from leaving the ground as is possible, reducing the number of enemy planes our Continental Air Force will have to deal with.

And here I return to one of the central facts of this
(Continued on page 52)



THE FORTUNES OF PEACE

America's first successful long-range pilotless bomber—the TM-61 Martin Matador—is a major weapons system conceived and developed in peacetime. And it is helping to keep the peace in an important way.

For the Matador is in quantity production, and already widely deployed. As the first aircraft having complete interchangeability of parts, it is transportable by air and can be delivered unassembled for stockpiling in critical outpost areas.

The new engineering concept that produced the

Matador has already revised many design and production standards in the aircraft industry. For this versatile weapons system is being produced at the lowest cost-per-pound for comparable production, despite performance requirements more severe than those for most piloted aircraft.

Today, the new Martin engineering concept is revising the calendar on some of the most advanced flight and weapons systems projects now in the research and development stages.

These are among the Fortunes of Peace!

MARTIN
BALTIMORE

Other Comments on the Godfrey Article

"... In the current issue of The Saturday Evening Post, Arthur Godfrey has a piece in which he makes some very sweeping statements to the effect that SAC is being starved and shortchanged. It will create some controversy, I hope. And I wouldn't mention it except that Godfrey's claim is backed up by the Air Force Association and by Gen. Tooev Spaatz, who knows what he's talking about when it comes to air bombardment."

From Edward R. Murrow's
broadcast over CBS, December 20, 1955.

Views attributed to radio commentator, Mr. Arthur Godfrey, are substantially in consonance with my own. The future military security and economic stability of our country can be most effectively accomplished through emphasis on airpower. The application of airpower should be facilitated by appropriate land and sea forces in supporting roles.

A. C. Wedemeyer
General, US Army (Ret.)

The Air Force and the people of the United States are lucky to have Arthur Godfrey appreciate the value of airpower, not, as he himself admits, because he is an authority, but because as we all know, so many people listen to what he has to say and believe him when he says it.

Some of us may have been saying the same thing for a longer time, but saying something and getting people to believe it are frequently two different things.

His conclusions in The Saturday Evening Post are those of the Air Force Association and the Hearst papers, but I am sure he will help to convince many who, despite yours and our efforts, remained unconvinced until reading his arguments.

W. R. Hearst, Jr.
President, Hearst Publications, Inc.

I have read your article in the current Saturday Evening Post and am very proud to see you add your powerful voice to those who want the American people given the truth about our relative military strength as against that of the great and growing Communist conspiracy.

You are right when you say that "we as a people are badly confused about our military situation." You are right when you say "we should have an immediate, thorough, and public investigation."

We, in this country, must not allow the money-firsters to place a price tag on our survival.

Nor is it necessary, because if we were to start building our defense structure on the basis of progress and stop building it on the basis of tradition, we could obtain far more defense at far less cost. Good luck and kind regards.

Sen. Stuart Symington

matter. . . . No American bombing mission, once launched, was ever turned back short of its target by enemy action. It is, therefore, only reasonable to assume that any first-class bomber force would have the same success. Despite anything we can do in the way of continental fighter defense, some enemy planes will get through. And, since nowadays one horrible H-bomb is all that's needed to wipe out an entire city, we can't afford to allow even one plane to arrive over target. So . . . we must never let the enemy get off the ground! . . .

What I propose is an immediate, thorough and public investigation—by elected representatives of the people—of the Soviet long-range, nuclear-bombing capability and of the means by which it can be countered or destroyed, if necessary. It is my contention that we, as a people, are badly confused about our military situation. I think we have failed to understand the terrible potential of the SOVSAC—Soviet Strategic Air Command—and therefore fail to realize that the only answer to it is a long-range nuclear-bombing force, not only as powerful as theirs but far superior. As a matter of fact, anything short of this is a witless waste.

Now and then somebody tells me, with a touch of scorn, that I am not a military authority. Of course, I am not, and I don't pretend to be. Neither, except for my knowledge of flying, do I have any information about these matters that isn't available to everyone. The plain fact is, however, that I have personally investigated this problem far more intensively than the average citizen—perhaps even more carefully than most newspaper and magazine writers—and I do know what I am talking about. Moreover, I launched this crusade for airpower on my own, simply because it is the consuming conviction of my life; I wasn't egged into it by Air Force brass. I say this plainly, because everyone knows of my close friendship with Curt LeMay.

I want to make it plain also that, in urging a full public investigation, I certainly don't want to see airpower become a political football. But I am convinced it is only through an investigation that we will get the needed action. One thing that is sure to come out in such an investigation is that guided missiles, radar screens, and fighter planes are no substitute for long-range bombers, and another is that air reserve units do not take the place of a regular Air Force. This is a full-time job for the best men and the best planes we can get. Moreover, we must pay these men enough to get top-notch personnel who will stay on the job. After all, we can't expect patriotism to take the place of decent wages.

Another thing: It was recently announced that our military inventory amounts to 124 billions of dollars in the USA. Yet we have far less than 10 billions in SAC—the only outfit we've got in being that can deter an enemy long-range bomber attack. Something is obviously wrong, and it doesn't take a military genius to see it.

These are the things I believe about airpower, and I feel them so strongly that last spring I resigned my coveted commission as commander in the Naval Reserve, because I wanted to be free to speak my piece. I intend to go right on speaking it in my programs on the air.

Through the millions of readers of the "Post" and the millions of listeners and viewers of Godfrey's radio and TV shows, the airpower story got through to a lot of people who otherwise just wouldn't know what it was all about. This is airpower education at the grassroots level—something we've been screaming about for ten years.—
THE EDITORS

(Mr. Godfrey's remarks reprinted by special permission of The Saturday Evening Post. Copyright 1955 by the Curtis Publishing Co.)



Members of 62d Troop Carrier Squadron unload supplies at Dreux AB, France.

Special Report on Europe

THE WESTERN ALLIANCE— MORE SYMBOL THAN SHIELD

By Lee Klein

ASSOCIATE EDITOR, AIR FORCE MAGAZINE

LAST fall was probably the first time that anyone had gone from Washington to Paris by way of Smyrna, Tenn. A group of us were invited to accompany the 62d Troop Carrier Squadron, a unit of the 314th Troop Carrier Wing, on its trip from Sewart AFB, Tenn., to Dreux AB, France. The 62d was relieving the 778th Troop Carrier Squadron, based at Rhein-Main, Germany. (The move from Germany to France was made simpler by doing it while rotating squadrons.)

At Sewart AFB, our Washington group joined forces with radio, TV, and newspaper men from the Tennessee and North Carolina areas. We were briefed, watched some of the loading operations, and saw the last elements of the squadron's C-119s taking off on the first leg of the 4,246-mile journey. The squadron's own planes could not carry all the men and equipment, so four C-124s of the 62d Troop Carrier Wing (Heavy) of Larson AFB, Wash., were brought in.

We flew to Paris's Orly Field with stops at McGuire AFB, N. J.; Harmon AFB, Newfoundland; and Lajes Field in the Azores. Only two overnight stops had been planned but bad weather and high winds stretched the trip to five days.

From Paris, where we went through customs, it was a short hop to Dreux



At Mutual Weapons Development offices in Paris, Col. John Driscoll and Dr. Theodore von Karman discuss fighters.

AB, where the 62d was getting settled. In a ceremony there shortly after arrival, as a gesture of French-American friendship, the 62d presented several gifts, including a cedar chest (made in Tennessee, of course) to the French Prefect of Dreux. Dreux must have looked grim to the men of the 62d. The buildings are ugly and look old (though they are not), and the plumbing and heating are ancient in principle if not in age. Dreux is a NATO base, built by French labor with NATO funds on French-owned land. After seeing some of the other European bases, especially in Germany, Dreux looks even worse in retrospect.



A TM-61 Martin Matador is raised into position at a First Tactical Missile Squadron launching site in Germany.

On Monday morning, after a weekend in Paris, we went to the Paris office of USAFE for a quick briefing on NATO and then boarded buses for SHAPE headquarters—a pleasant thirty-minute ride. SHAPE Commander Gen. Alfred Gruenther was out of town, but his air deputy, Gen. Lauris Norstad, and a French and British officer of his staff, gave us a good rundown.

NATO and SHAPE have had some shaky times since the North Atlantic Treaty was signed in April 1949. But those close to the alliance enthusiastically point to its positive accomplishments. Among these, according to the officers at SHAPE: we are still at peace; there has been no expansion of Communism to the west since Czechoslovakia; the participating nations have built up a high degree of unity by working together; and there seems to have been a change in Soviet tactics.

We were at SHAPE during the talk about a post-Geneva "relaxation" among member nations. Officials at SHAPE denied any let-down and said that "almost all the countries are maintaining their NATO budgets at the present time." General Norstad said that Britain's cutback of troops did not affect its commitment to NATO. Liking the Russians to a

(Continued on following page)

dancing bear, France's Gen. Jean Nemo said, "We have to be ready to hit if the bear stops in his dance and starts biting." He felt that neither the Soviets nor the West enjoyed any geographical advantage in Europe. A veteran of recent battles with the Reds, General Nemo said, "They are demons—but demons make good soldiers."

The wheels at SHAPE were reluctant to make numerical comparisons. The Soviets are far ahead of us in numbers—about four to one. NATO has only about 5,000 aircraft, but General Norstad said the program is not yet complete. And that, according to him, is one of SHAPE's biggest problems: "Doing in the next three or four years what we reasonably can and should."

As for facilities, some tangible progress has been made. In 1951 there were fewer than fifteen NATO airfields. Now there are close to 160. According to General Norstad, "We now have a force which would make the Russians pay a hell of a price for aggression." But he didn't feel the Reds were ready to start anything—right now. He listed what he considers NATO's principal problems. They are:

- **Survival**—The enemy has the initiative. We must be able to absorb some blows before we can strike back.

- **Dispersal**—With present aircraft, a workable program is expensive, in money and people. The wartime plan calls for spreading our forces over a wide area, using national and commercial fields, with sixteen to twenty-five airplanes on each field. One measure of defense is an increase in the number of targets that we present.

- **Air Defense**—General Norstad called this one of the biggest problems at that time because each nation was responsible for its own air defense and the system suffered from a lack of unity. He was confident that the nations would agree to an integrated air defense system. Shortly afterwards, the North Atlantic Treaty Council approved a new air-raid warning system stretching from Norway to Turkey.

Intelligence information is available to member NATO nations on a "need to know" basis, and while General Norstad said that our allies now know enough about nuclear warfare "to carry out their missions," he felt that "we haven't done as well as we should have on exchange of information." A big step in this direction was made by a US-British decision to inform their allies of new equipment as quickly as possible. As a result, the new air raid warning system may be



This barracks at Dreux AB is the temporary home for the airmen of the 62d.

supplied, funds permitting, with recently developed gear that bounces transmissions off the troposphere, making them tough to jam.

From Paris, we flew to USAFE headquarters in Wiesbaden, Germany. Wiesbaden is a city of about 285,000, twenty-five miles from Frankfurt and only five jet minutes from the Iron Curtain. USAFE, once spread over thirty-three offices downtown, is now housed in a remodeled *Luftwaffe* building on the edge of the city. The area is loaded with old-world charm, plus all the modern conveniences. Excellent housing and school facilities make it a pleasant place to spend an overseas tour.

"United States Air Forces in Europe" is actually a misnomer because the command's responsibility is not limited to Europe, but spreads over an area three times the size of the US. Its mission after World War II was to disarm the *Luftwaffe* and guard against a Nazi uprising. But things have changed considerably since 1945, and now USAFE's job is to "deploy, train, and support US air forces in Europe." It also trains and assists our allies through the Mutual Defense Assistance Program (MDAP).

USAFE is a big command. Its funds, inventories, equipment, aircraft, land, runways, and buildings are valued at \$3.6 billion. Of this, USAFE actually owns \$2.9 billion worth with the difference representing land and buildings scheduled to be returned to the Germans. Staff figures show that the USAFE economic impact in Europe amounts to \$881.3 million annually, while the American tourist trade in Germany only contributes \$319.9 million.

Most of our people stationed in Germany—especially near Wiesbaden—seem happy with their facilities. They do look good, especially compared with some facilities in France. However, in France, our bases are relatively new and raw while the ones in Germany are well established. The command still occupies many houses



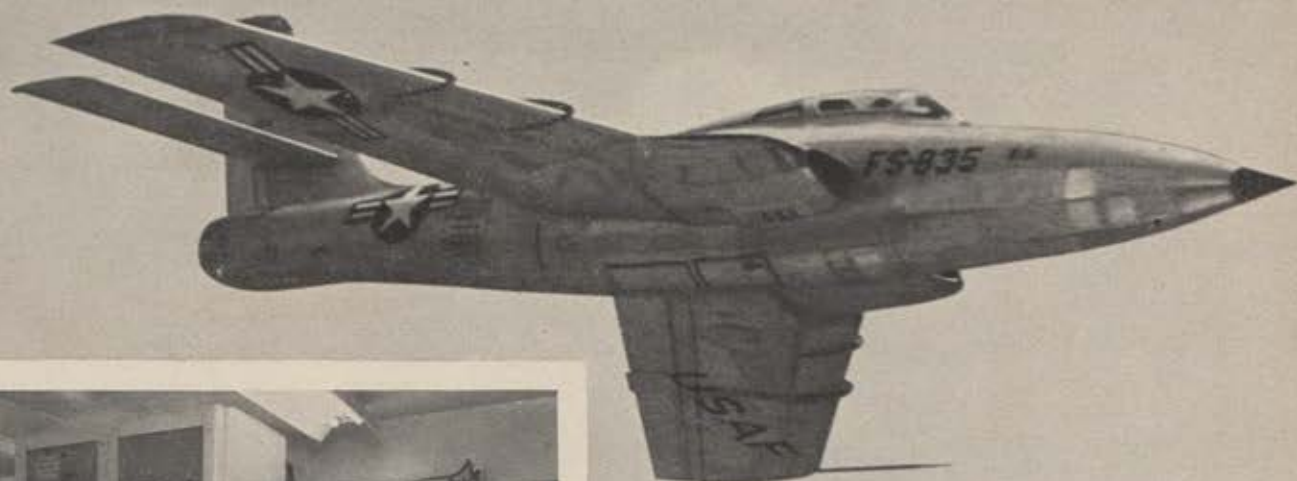
Products from Tennessee were brought as a goodwill gesture to the French.

and buildings requisitioned from the Germans, but these are being returned as quickly as possible.

In line with US policy, USAFE employs 43,000 "native sons." It costs an estimated \$1,500 annually for a native employee, way under the figure for an American doing the same job.

USAFE's commander is Gen. William Tunner, a logistics expert (Berlin Airlift and Korean Combat Cargo), so it is natural to assume that the command's supply system is efficient. It is. Use of air transport has cut the command's pipeline for priority materials from seventeen days in 1953 to four days. Routine shipments were cut from forty-five to sixteen days in the same period. Base supply stocks have been decreased from forty-five to thirty days and depot supply stocks from ninety to sixty days. This frees a lot of previously tied-up money for other work, when you figure that it takes \$1.4 million to supply USAFE for one day. Aircraft out of commission because of parts have been reduced by ten percent in the same period. Officials at USAFE estimate that it would cost them \$350,000,000 to buy the numbers of aircraft this represents.

Housing has been a big USAFE
(Continued on page 56)



FLIGHT DATA IS TELEMETERED from test aircraft, like this modified RF-84F, to receiving equipment in the G-E Flight Test Center. Direct-writing recorders display the test data, allowing immediate engineering evaluation.

How telemetered flight test data speeds development of G-E flight control systems

By allowing engineers on the ground to evaluate test data while flight tests are in progress, a telemetering system is speeding the development of General Electric flight control systems. Any required in-flight adjustments to equipment or changes in flight test plans are radioed directly to the test pilot. This ability to refine the tests as they are in progress greatly increases the amount of pertinent data that is collected per flight.

General Electric has extensive experience in designing, developing, and manufacturing many types of flight control systems. Valuable experience has also been gained with tying in flight control systems to bombing, approach, and fire control systems. All this experience is being put to use in building flight control systems for the latest supersonic aircraft.

FOR DETAILED INFORMATION on G-E flight control systems, contact your General Electric Aviation and Defense Industries Sales Office. Section 221-4, Schenectady 5, New York.



FLIGHT TESTING is performed at the General Electric owned and operated Flight Test Center at Schenectady, N. Y.

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Top officers of SHAPE—front row, left to right: Gen. Alfred M. Gruenther, Supreme Allied Commander, Europe; Field Marshal Viscount Montgomery, Deputy Supreme Allied Commander. Back row, left to right: Gen. Lauris Norstad, Air Deputy to SACEUR; Air Marshal Sir Walter Dawson, DCS/Plans and Operations; Adm. Andre G. Lemonier, Naval Deputy to SACEUR; Lt. Gen. Pierre Brisac, DCS/Logistics and Administration; and Lt. Gen. C. V. R. Schuyler, Chief of Staff.



Trailer park at Chambley AB is one of nine at bases throughout France.



Through "Project Caravan," the AF buys house trailers for \$2,910 and rents them for \$55 a month. Addition of the lean-to shelter (left) and planting of grass and flowers are done at trailer occupant's expense.

USAFE

CONTINUED

headache—outside of Germany. Most housing is now obtained by giving private contractors a five-year guarantee for a ninety-five percent occupancy rate. The five-year limit is all the present laws allow, but USAFE would like to see this limit raised to ten.

"Project Caravan" has helped ease the housing pinch. It began early in 1954 when USAFE married personnel at Toul, France, faced the alternative of lousy housing at gouging prices or no housing at all. A trailer camp grew up near the base, but it lacked even such essentials as running water and sewage disposal. An AF committee studied the problem and came up with the present "Project Caravan." General Tunner took the plan to Washington, where he got a green light. Under the plan, the AF buys trailers for about \$2,900 and rents them for about \$55 a month, including utilities. By the end of 1955 more than 1,600 trailers had been delivered to bases in France and almost 1,000 had gone to North Africa. The AF builds and operates the trailer parks, and each occupant is encouraged to plant shrubs, trees, and flowers to

improve the appearance. The trailers are admittedly an expedient, but they provide temporary low-rental housing until something better can be built.

As previously mentioned, one of USAFE's important missions is training our allies through the Mutual Defense Assistance Program. Our hosts felt that we should see that part of their program so they scheduled a flight to Furstenfeldbruck AB, near Munich, where the USAFE Training Hq., Provisional, is based and where foreign pilots check out in jets.

In Furstenfeldbruck our forces have taken over an old *Luftwaffe* base. It was here—in 1944—the Germans flew their first operational jets. Col. Mark H. Vinzant, Jr., commands the USAFE Training Hq., Provisional, and also the 7330th Flying Training Wing (MDAP), which does the actual training. Since MDAP students started training in the spring of 1954, more than 500 students, from Spain, Turkey, Holland, Belgium, Denmark, Greece, Italy, Norway, Pakistan, Portugal, the United Kingdom, and Iran, have finished the course. The school offers instrument training, jet transition training, a jet instructor course,

and a senior staff officer course. All students who come to Fursty are rated pilots in their own countries.

The language problem was overcome by requiring all of the first student group to be fluent in English. The outstanding ones were then picked to stay on as instructors.

Two other units, the 7351st Flying Training Group, based at Landsberg AB, and the 7331st Technical Training Wing, at Kaufbeuren AB, also train MDAP students. The 7351st trains pilots in conventional aircraft and the 7331st teaches aircraft engine maintenance and repair, communications and electronics, armament, traffic control, intelligence, supply, and photo interpretation.

Next day, a beautiful, clear morning, we took off from Fursty and headed north toward Bitberg AB, near Trier on the Luxembourg border. The base is the home of the First Tactical Missile Squadron. Lt. Col. Walter Schlie, the commander, said their mission is to "destroy assigned targets within the guidance capabilities of the TM-61A (Martin Matador) weapon system in a minimum of time,

(Continued on page 59)

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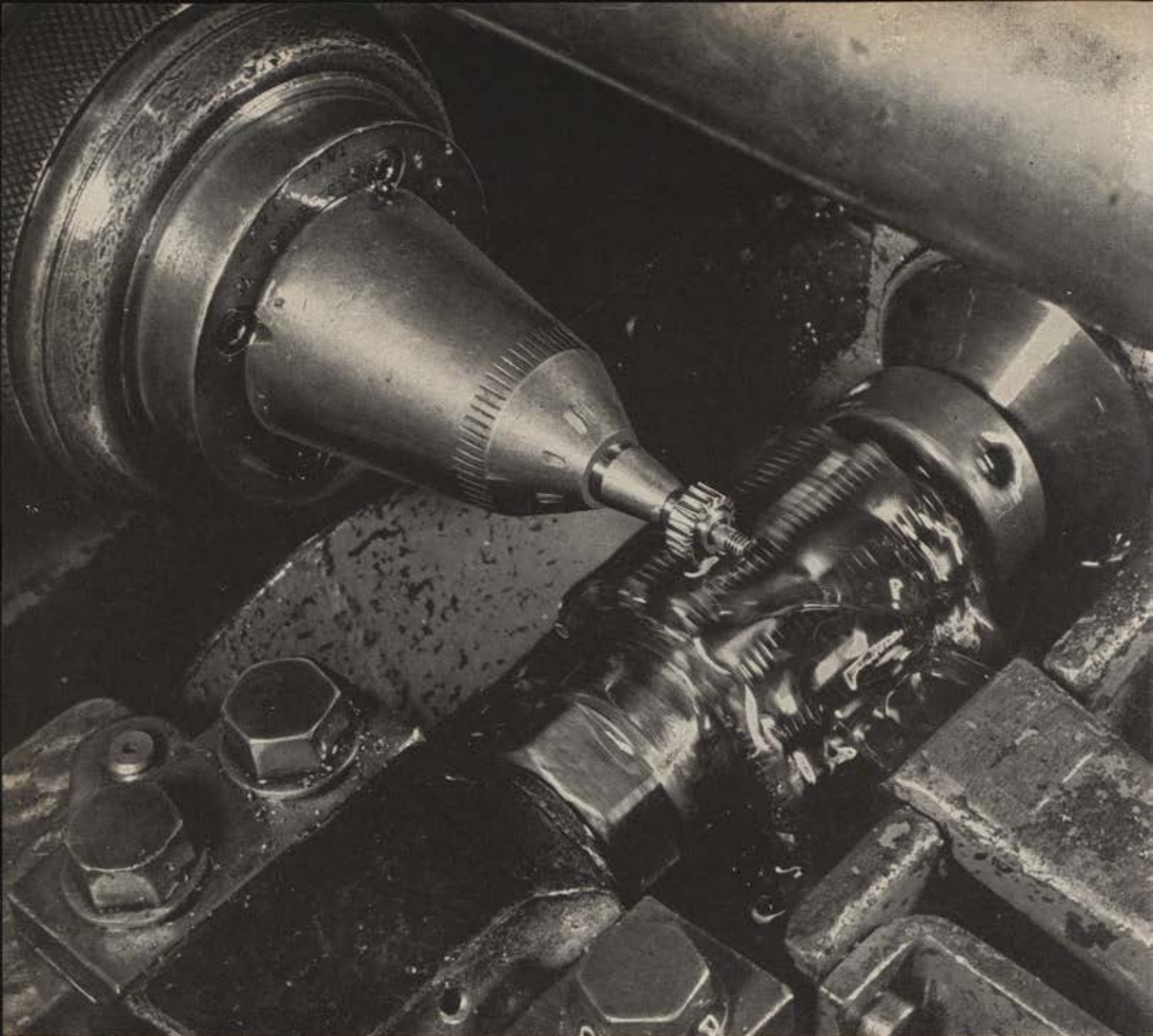
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Lt. Troy Washburn, MDAP instructor, gives a radio compass briefing for the benefit of two French pilots (left and right) and two other USAF instructors.



Turkish pilots Lt. Suleyman Atalay, in cockpit, and Lt. Siyami Tastan.

in any weather condition, at any time of day or night."

The Matadors, poised on their racks at the launching sites, look out of place in the peaceful German countryside. As Lt. Russell Selby ran his launching crew through its paces, we could see a German farmer plowing in an adjoining field. Against a backdrop of brilliant autumn colors, the deadly, but beautiful, missile looked incongruous. The crew went through a launching drill in jig time.

For actual firing practice, the Colonel takes his men to a range in Africa. They can also get some good simulated practice right at Bitberg by using a T-33 fitted with a Matador guidance system. The pilot flies the pseudo missile in response to the signals he receives from the ground crew—thus getting a pretty good picture of the guidance capabilities. Although the Matador is relatively crude as missiles go, its guidance system is so complicated that the AF is considering using contract technicians to maintain them. The TM-61 has a speed that compares favorably with the F-86, a range of approximately 500 miles (fuel range) and can carry a 3,000-pound warhead.

From Bitberg, I took a train to Paris to visit the offices of our Mutual Weapons Development Team.

In Paris I went to the office of Col. John J. Driscoll, AF member of the team, at 2 Rue St. Florentin, in the old Hotel Talleyrand. The team is headed by Lt. Gen. T. B. Larkin, USA (Ret.) and also includes members from the Army and Navy.

Their program began about two years ago under the Office of the Assistant Secretary of Defense for Research and Development. Originally, it was set up to transplant US hardware into our allies' military organizations, but experience showed that financial aid to the research and development programs of other nations fits their needs better than hard-

ware assistance. Often countries can better develop weapons to fit their own military requirements and their production and maintenance capabilities. For example, the French had a good carrier airplane design, but needed help to get into production. We offered them some of our planes instead, and, being a frugal people, the French accepted the offer. Some of our MWDTP people feel that this can only result in slowing down the development capability of a country. Now the program is oriented toward putting our allies back on their R&D feet. They agree to make any developments available to NATO and us.

Right now, there are about sixty R&D projects among the various NATO nations in which we have an interest. These range from light fighter projects to photo reconnaissance equipment, plus Army and Navy projects.

Colonel Driscoll feels that a suitable light fighter is the most urgent requirement in NATO today. He puts it this way: In the West, our jets are anchored to permanent, and vulnerable bases. On the other side of the curtain, the Russians are training on grass fields with their MIG-15s, and if the bell rings, they will be dispersed in woods and cow pastures.

The type of light fighter visualized is one that lands and takes-off on skids. NATO has a requirement for a 3,500-foot take-off, but the experts hope to reduce this to 1,000 feet. A squadron of these planes could be dispersed over ten or twenty miles.

There is a tendency among some of our officials to drag their feet on the light fighter program because with no supersonic requirement for the aircraft, it represents a step backward to them. The avid supporters disagree, however, and say that the requirement for a good light fighter is going to be with us longer than the requirement for many of the hot jobs. They argue that the interceptor will bow out because of the ground-to-air

missile and the bomber will go because of the ballistic missile, while ground support—because "we need a piloted vehicle for moving ground targets"—will be the last to go.

Dr. Theodore von Karman dropped in for a few minutes to discuss light fighters while I was in Colonel Driscoll's office. Doctor von Karman, as chairman of NATO's Advisory Group for Air Research and Development (AGARD), coordinates the West's research and development effort. Colonel Driscoll's group works with AGARD on problems of mutual interest.

It is difficult to visit NATO, SHAPE, and USAFE headquarters and not become enthusiastic about what has been done since the end of World War II. NATO has struggled against terrific odds but can point to some definite accomplishments as can USAFE, handicapped by the traditional hostility of a conquered nation to occupation troops.

But have our efforts in Europe really paid off? The critics say that NATO is out of date, and to build it up into the force it should be, defense budgets would have to be doubled.

The real value of NATO has not necessarily been its physical strength, but the fact that it represents a line drawn across Europe which the Soviets have been warned not to cross. The Russians have probably never been too worried about the men, guns, and airplanes of NATO, but they are concerned with what is behind it. The reason they didn't make a move was not because they were afraid of NATO. But they respected the deterrent capability of our Strategic Air Command.

We no longer enjoy a nuclear monopoly. The Russians are catching up, and may be ahead in some respects.

It is in this light, under the new set of conditions that exist in Europe today, that we should reexamine NATO and Western defenses.—END

AVIATION— The Next Twenty Years

An eight-man Aviation Facilities Study Group, headed by N. Y. investment banker William Barclay Harding, has submitted to Budget Director Rowland Hughes a report on ways to cope with air traffic problems. Excerpts below include "Future Aircraft" and "Air Navigation" by AFA Director T. F. Walkowicz (see also page 33); "Operating Problems" by Gen. Harold R. Harris, president of Aviation Financial Services, Inc.; and "Airports" by Fred M. Glass, former Aviation Director of the Port of New York Authority.

FIFTY years ago the sky was virtually uninhabited by man and his inventions. In fifty years the air has become the principal medium for the conduct of offensive and defensive military operations. The growth of the air transportation industry, which has resulted in some of the largest airlines carrying more inter-city passengers than the largest railroads, is well-known. The growth of miscellaneous commercial and private flying—termed "General Aviation"—is not so well appreciated. It is surprising to many, for example, to find that there are more than fifty times as many aircraft engaged in General Aviation as are flown by the US airlines, and that these airplanes fly two and one-half times as many aircraft miles as the airlines fly.

Aircraft are not the only users of the airspace. Other demands on it include artillery and missile ranges, restricted security areas, defense warning zones, TV and radio towers. In brief, the sky above us is being used for a variety of purposes and what goes on in it is destined to affect the lives of every living person.

In the course of our study we have asked many questions relating to the use of the airspace and the adequacy of facilities required for its efficient use. (We think of Aviation Facilities as comprising airports, navigation aids, traffic control devices, and the communications that link them together.) The answers that we have received have convinced us that much of our airspace is already overcrowded and that, in many important areas, the development of airports, navigation aids, and especially our air traffic control system, is lagging far behind both aeronautical development and the needs of our mobile population and of our industry.

Reports presented to us by responsible groups indicate that the risks of mid-air collisions have already reached critical proportions, and that the collision hazard is becoming greater as the increase in civil and military air traffic outpace the capabilities of outmoded traffic control facilities.

This condition is not, apparently, due to lack of scientific knowledge necessary for a solution. The Defense Department is even now proceeding with the installation of a \$3 billion air defense radar system which, we are

advised, could be adapted to provide the main elements of safe and efficient aircraft separation and traffic control wherever required. The deficiency in our traffic control system is attributable in part, to the fact that aircraft capabilities and public demand for air transportation have proceeded much faster than anticipated. It is also due to the lack of general appreciation of the need for a "systems" approach to our aviation facilities development. Because of this lack of appreciation, the technical knowledge which is available has not been fully utilized and the programs needed to meet our traffic control requirements have not been formulated.

The multi-million dollar leviathans of the air which our aircraft manufacturing industry is creating in the jet age must become integral parts of a transportation system which includes the *airport* complex (with adequate approach areas), the *airway* (with its traffic control, navigation, and instrument landing devices) and the associated *communications* on the ground and in the air. All of the Aviation Facilities mentioned have to be developed concurrently with the development of the aircraft which will use them. . . .

• • •

Future aircraft performance, productivity, and operating costs: Four principal factors appear to characterize future aircraft design and performance.

First, aircraft speeds can be expected to increase greatly. Commercial transport operating speeds can be expected to rise from today's 300 miles per hour to 1,000 miles per hour by the end of the twenty-year period. Military operations in the supersonic ranges will be commonplace.

Second, today's maximum civil operating altitude of about 25,000 feet will be increased to 40,000 or higher, putting jet airliners into the same airspace that is now the province of the military. . . .

Third, civil aircraft will show greatly increased productivity. Productivity is the payload multiplied by the number of miles operable within a given period. For example, one of our latest type transports now in transatlantic service has the capability of carrying about 40,000 passen-

(Continued on page 66)

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This new Allison engine harnesses the vast power of a modern gas turbine to a propeller. It uses less fuel than a straight jet, yet it enables aircraft to fly faster with greater payload than any other propeller-type aircraft engine in commercial use today.

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We of Eastern congratulate General Motors on this great achievement in aircraft power, an achievement that will help bring the untold benefits of modern air transportation to more millions of people in the years to come.

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Chairman of the Board, EASTERN AIR LINES

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Type Room Desired Rate

ARRIVAL DATE & HOUR

DEPARTURE DATE

OTHERS IN ROOM

gers both ways between New York and London annually. Each one of the jet transports being ordered for transatlantic use in 1959 and 1960 could produce about three times this volume of annual passenger transportation. . . .

Fourth, is the trend toward lower direct operating costs. The direct seat-mile cost of operating passenger aircraft is expected to go down about thirty percent in the twenty-year period. The direct operating ton-mile cost of cargo aircraft is expected to be reduced about eighty percent by 1975. . . .

In summary—future civil and military aircraft will fly much *faster*, at much *higher altitudes*, carrying *greater loads*, and they will do this at significantly *lower* direct operating costs. Furthermore, *vertical-rising* and *steep gradient* aircraft will begin in an important way to take their place in the national transportation picture.

Operating problems: We have been led to believe that the number of active military aircraft will increase only slightly through 1960-1965, and then level off or decline as individual aircraft capabilities improve and as missiles take over some of the functions of manned aircraft, but it is anticipated that there will be a substantial and continuing growth in the civil aircraft population. We look for a net increase of about thirty percent in the total number of active aircraft in the next twenty years.

While we expect a thirty percent increase in active aircraft, that is only part of the picture. The utilization of aircraft in miscellaneous commercial, corporate, and private flying has been steadily increasing. Likewise, increased speeds and efficiency have increased airline miles operated per aircraft. Thus, we can expect not only a substantial increase in aircraft population, but at the same time a much greater increase in aircraft movements. . . .

Since 1950 there have been over sixty-five mid-air collisions involving civil aircraft in the United States resulting in heavy loss of life and equipment. Fortunately, so far, none have been between two of our largest transports when fully loaded. . . .

At present, we are continuing to fly more aircraft faster, higher, and more and more often, with what appears to be a rather casual disregard of the hazards involved. We are, as several industry and government officials have told us, "flagrantly defying the law of averages."

A recent study by a special committee of airline pilots and operators in conjunction with the Air Transport Association of America indicates that there are, on the average, four reported near collisions involving the airlines daily. The report states that about twenty-five percent of those near collisions had the aircraft passing within 100 feet of each other. Military flying statistics confirm the extent of this danger, which, of course, involves all users of the airspace, private pilots, executive transport operators, as well as the airlines and the military. Only recently has this critical airspace congestion become publicized in the trade and general publications. . . .

Air navigation and traffic control: Since 1948, when the nature and magnitude of the air traffic control problem was first clearly identified, two parallel but independent projects relating to the control of air movements over our continent have been under way. One is the Civil Aeronautics Administration's traffic control program on which \$110 million has been expended. The other is the military air defense radar program in which \$670 million has been invested.

The semi-automatic air defense radar network called SAGE (Semi Automatic Ground Environment), has been

under development since 1949, and will begin operating on a limited basis in the near future. It provides for the automatic transmission of information from a large number of radar scopes to a central electronic computer, where the data are processed to display pictorially all the aircraft operating over an extensive region. According to publicized reports, this system, when completed, will be able to detect, identify, and track all aircraft over the continent of the United States and its approaches.

Primarily designed for air defense, SAGE is, to a great extent, capable of a double duty for air traffic separation as well. Doing this double duty would, in fact, exercise and enhance SAGE's air defense capability. Exploiting this double capability takes on added urgency as we contemplate the additional \$260 million which the Civil Aeronautics Administration has discussed spending in the next five years while the military is rushing to completion its \$3 billion investment in SAGE and its associated radars.

We must emphasize at once, however, that the Civil Aeronautics Administration's system and the SAGE military system have different objectives even though both are basically designed to locate, identify, and track aircraft. Obviously, from a defense viewpoint, no delays are tolerable in achieving the primary purpose of SAGE. Furthermore, although automation will increase capacity and reduce costs, common use of SAGE can only be achieved after further development and testing and making available additional resources of dollars, facilities, and personnel. In other words, a second duty must not be imposed on SAGE without providing the wherewithal to perform it.

We are convinced that planning and development should be accelerated for the use of SAGE in those areas where traffic density is already too great to permit handling by the present obsolete systems. . . .

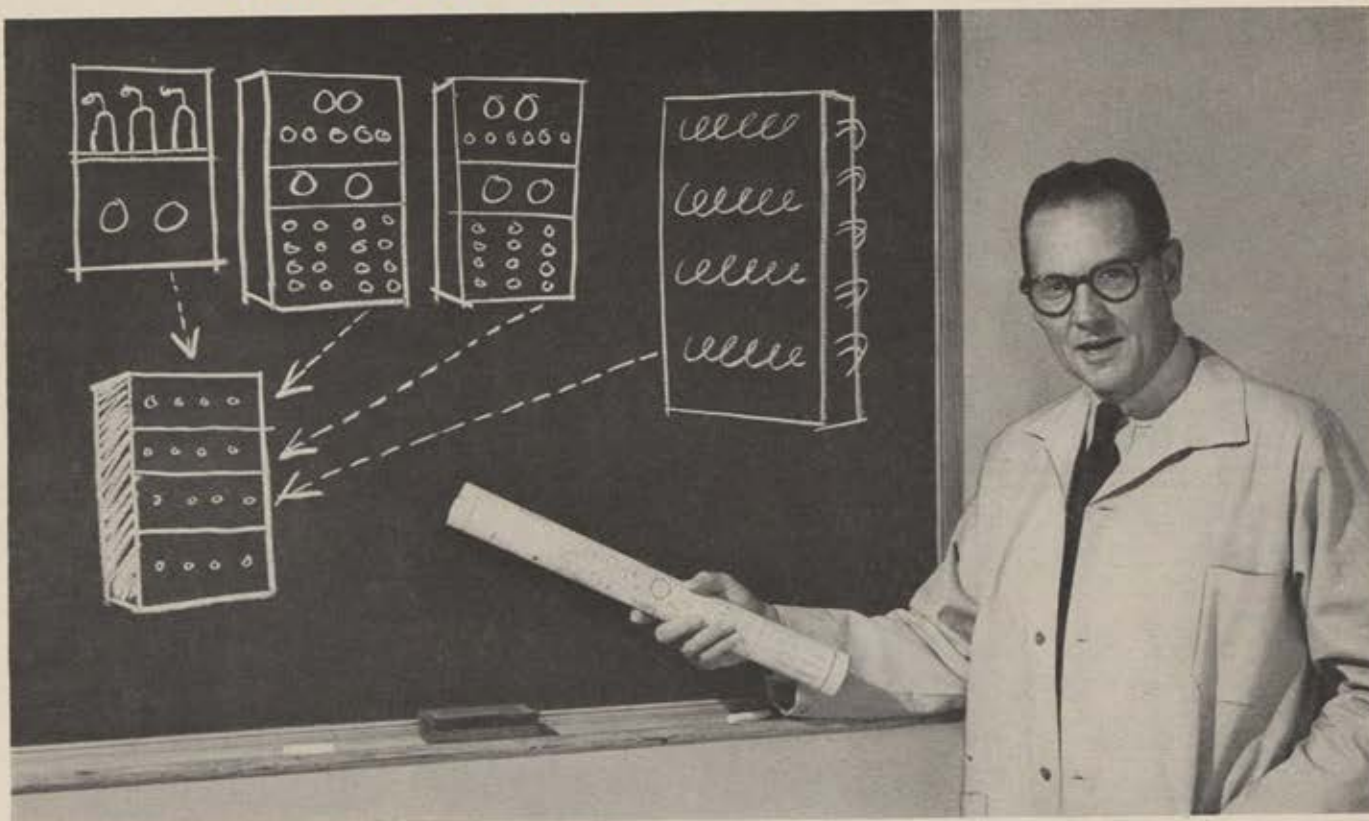
Airports: Cities and local communities should be advised of traffic requirements which their airports should be prepared to meet in 1960, in 1965, and in 1975 so that airports will not become bottlenecks of an improved Aviation Facilities system. They should be provided with continuously revised estimates of plane movements in order that ample terminal facilities and handling space can be provided; the operating characteristics and tire footprint pressures of future aircraft, etc., in order that land acquisition, runway lengths, and weight-bearing characteristics will be adequate. Plans for nearby military and civil airports should be coordinated in order that runways may be properly located and traffic control procedures properly integrated.

The high noise level of jet-powered aircraft has created extremely difficult problems in community relations for the military services and will create additional problems of a very serious nature for civilian operators as jet-powered aircraft are introduced, unless the designers can find a solution.

The federal government, in setting military aircraft procurement specifications, and in the allocation of research and development funds, could, in our opinion, do much more than is being done toward the solution of the noise problem. . . .

A consideration of no small concern from a national defense standpoint which seems to require special note, is the fact that although civil airports should and must provide a reserve for military use in time of emergency, to our knowledge, no single civil airport in the country is capable, at the present time, of handling the Air Force's principal long-range bombers at full operational loads on a sustained basis. What this means to the military's ability to disperse its forces in time of emergency is obvious.—END

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In Los Angeles

THEY COMMUTE BY 'COPTER

By William W. Walker

'Copter connection with airliner makes traveling so much simpler.

THE Latins have a phrase—*Siempre Primero*—that so well describes the pioneering efforts of the world's first certificated and scheduled helicopter airline, Los Angeles Airways, that President Clarence M. Belinn has adopted it as the official company slogan. Translated, it means "Always First."

The first of LAA's "firsts" came on October 1, 1947, when the fledgling airline inaugurated the world's first 'copter mail service, from the LA International Airport to the roof of the Terminal Annex Post Office. This service now reaches 155 cities in the sprawling metropolitan area of Los Angeles, serving more than 6,500,000 people. In 1953 LAA carried the world's first air express by helicopter.

In the next two years the volume of air express cargo carried grew to more than 110,000 pounds a month.

Belinn, who was born in Lanse, Penna., fifty-two years ago and served in the US Air Corps from 1925 to 1929, got the idea for a short-haul feeder airline while he was stationed at March Field, near Los Angeles. In the course of his twenty-five years as a pilot (during which he has logged more than 3,000,000 accident-free miles) he became convinced that air transportation was destined to play a major part in the growth of Southern California. Events have proved that he was right.

Los Angeles is a focal point for transcontinental mail, and when the helicopter began to show its potenti-

alities in the early '40s, Belinn was quick to realize that the rapid collection and distribution of mail over traffic-congested metropolitan Los Angeles was a problem that the 'copter might solve handily. He began to organize Los Angeles Airways in 1944, but CAB approval for the service didn't come until May 1947. Five months later mail service began.

During the first month, the S-51 helicopters carried 60,000 pounds of mail. In contrast, in the first six months of last year the LAA fleet of five Sikorsky S-55s and three S-51s carried 3,371,362 pounds of mail—nearly 562,000 pounds a month. During the same period air express cargo averaged more than 110,000 pounds a month.

"AM 84," the symbol that appears in LAA insignia, stands for Air Mail Route 84. It consists of three segments that serve the San Fernando Valley, the San Gabriel Valley, and the coastal cities, providing shuttle service from the downtown Post Office and International Airport. Flight times range from five to fifty-five minutes.

The saving in time is striking. For example, a businessman who posts a letter for Chicago at, say, 5:30 p.m., can be sure it will be delivered first thing the next morning. LAA Flight 248 leaves the rooftop heliport at 6:38 p.m. to connect with an American Airlines flight to Chicago and points east, departing at 7 p.m. If the same letter had been delivered to the airport by truck, it would have taken well over an hour on the traffic-congested streets.

When the Post Office asked for evening service, LAA—working from scratch and with no experience to draw on—modified its whirlybirds for night and instrument flying. This meant lighting heliports for night landings without resorting to conventional public utilities. Ingenious use of "Scotch-Lite" reflectors as boundary markers and high-intensity railroad signal flares, lit a few minutes before the scheduled arrival, solved this problem.

LAA's eight-year record of round-the-clock operation is a performance any airline would envy—ninety-six percent of scheduled flights completed, except when bad flying weather prevailed. This ability to meet rigorous timetables, with seven-

Passengers from Anaheim, 45 miles from LA, make direct connections.



An LAA Sikorsky S-55, piloted by Henry Eagle, Jr., makes history as it arrives at the Long Beach heliport with the first scheduled air mail, in 1954.

ty-two daily schedules (seventeen of them with passengers), has brought about what President Belinn believes is the airline's major asset—public confidence in 'copter service.

November 24, 1954, marked a milestone in LAA history. On that date the company started passenger service from International Airport to a heliport along Hotel Row in Long Beach. The one-way flight takes just twelve minutes. Compare that with an hour of stop-and-go driving, and you see why this new service is so popular, with more and more cities begging for passenger pick-ups.

This passenger service allows fast, direct connection with scheduled airline flights and, in the words of

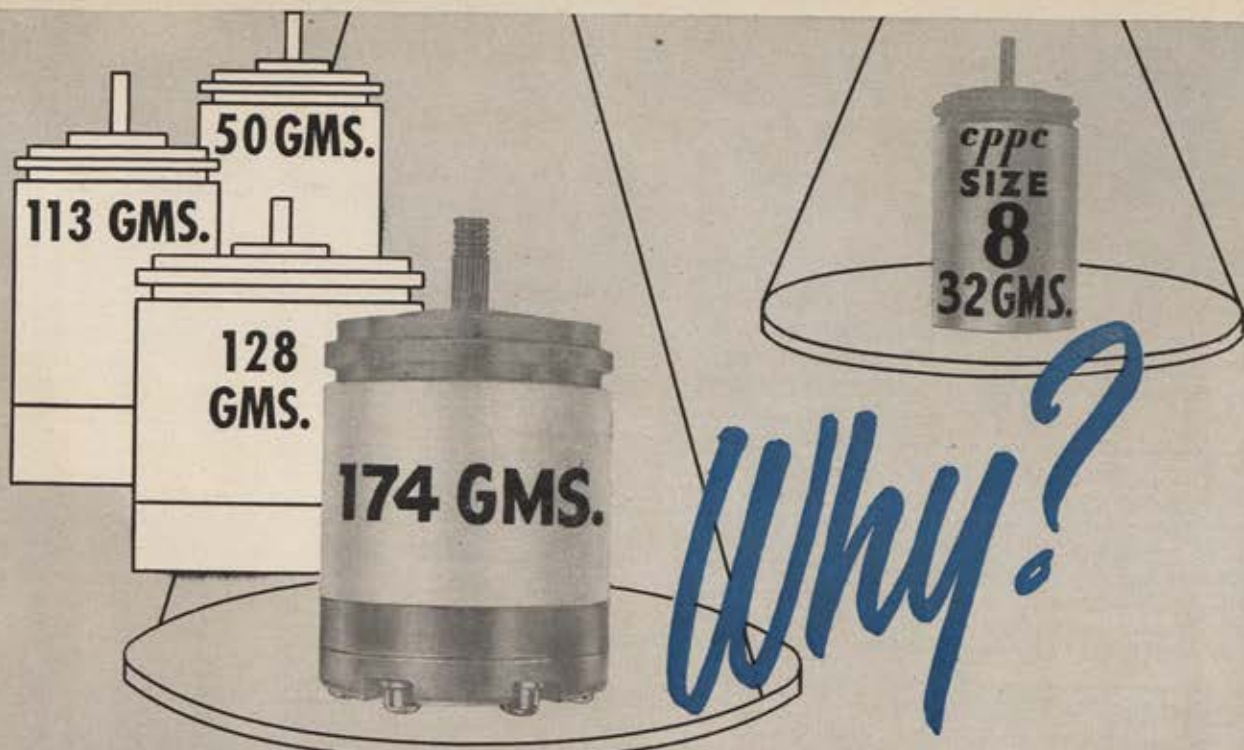
Belinn, gives transportation "a new dimension."

Techniques pioneered by LAA proved invaluable to the armed forces when fighting broke out in Korea in 1950. LAA trained technicians in the operation of helicopters under extreme conditions of combat—training that paid off in Korea, as any of the thousands of GIs who owe their lives to the mercy whirlybirds would testify. The Los Angeles airline also distributed to the AF, the Marines, and the Navy a syllabus outlining LAA's training program.

LAA's pilot-training program takes more than six months to complete. "Our pilots have an average of 2,000
(Continued on page 71)



Flying over congestion like this makes the ungainly helicopter seem attractive. This is a typical early morning traffic jam on the Hollywood Freeway.



WHY USE 1945 SYNCHROS IN 1956 DESIGNS?



Function	Type Number	Primary Element	Excitation Voltage 400 cy.	Input Current (ma.)	Input Power (Watts)	Primary Impedance Secondary Open (Phase)	Primary Resistance (line)	Secondary Element	Output Voltage	Secondary Impedance Primary Open (Phase)	Secondary Impedance Primary Shorted	Secondary Resistance (line)	Phase Shift Degrees	Sensitivity mv./deg.	Accuracy Minutes Max.
Transmitter	CGC-8-A-7	Rotor 1 Phase	26.0	100	.50	54+ j260	37.0	Stator 3 Phase	11.8	12+ j45	15+ j3.5	11.8	8.0	200	7
Control Transformer	CTC-8-A-1	Stator 3 Phase	11.8	.90	.23	28+ j110	24.7	Rotor 1 Phase	23.6	220+ j740	246+ j60	143	8.5	400	7
Control Transformer	CTC-8-A-4	Stator 3 Phase	11.8	37	.09	67+ j270	59.5	Rotor 1 Phase	24.0	508+ j1680	640+ j190	381	9.2	400	7
Resolver	CSC-8-A-1	Stator 2 Phase	11.8	84	.27	38+ j136	27.0	Rotor 2 Phase	23.2	280+ j600	344+ j75	230	11	400	7
		Rotor 2 Phase	26.0	39	.43	280+ j600	230	Stator 2 Phase	10.6	38+ j136	70+ j29	27.0	20	180	7
Repeater	CRC-8-A-1	Rotor 1 Phase	26.0	100	.50	54+ j260	37.0	Stator 3 Phase	11.8	12+ j45	15+ j3.5	11.8	8.0	200	30*
Differential	CDC-8-A-1	Stator 3 Phase	11.8	85	.21	27+ j120	25.0	Rotor 3 Phase	11.8	38+ j122	47+ j14	36.0	9.0	200	7 Rotor 7 Stator

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*Torque 2600 mg.-mm./degree from CGC-8-A-7



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Clarence Belinn accepts "Aviation Man of the Year" plaque from previous winner, Edward H. Heinemann of the Douglas Aircraft Company.

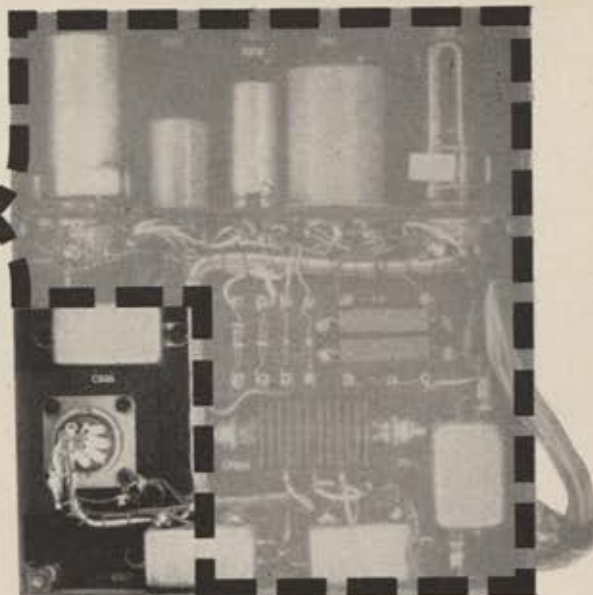
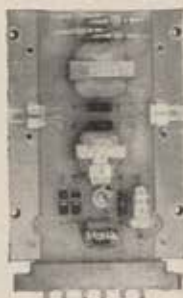
hours in fixed-wing aircraft before they ever start commercial 'copter training," says LAA Operations Manager Bob Bromberger, a veteran of more than 4,700 hours in 'copters. Trainees must also have at least 1,000 hours in military helicopters. The intensive six-month training period acquaints them with CAA regulations and the many phases of commercial airline operations the airline must observe to operate its split-second schedules.

President Belinn's contributions to the new dimension of travel last year won him the title "Aviation Man of the Year," a selection made by Southern California aviation writers in behalf of 7,000 employees of the eleven airlines serving Los Angeles International Airport. The title "Man of the Years" might equally well apply, in recognition of Mr. Belinn's many pioneering steps—development of night and instrument flying techniques for 'copters, the attainment of 1,000 hours between engine overhauls on helicopters, developing a complete system of heliports at moderate costs, achieving scheduled operating dependability that compares with that of fixed-wing aircraft, and many others.

Not one to live in the past, Belinn crystal-gazes with the best of them. The next decade or so, he predicts, will bring automatic flight control for helicopters; 'copter service to link airports with ocean liners, trains, and bus and truck lines; and networks of heliports around all large metropolitan areas that will prove as "indispensable to the airports as sidewalks are to the downtown merchants."—END

Bill Walker, an active AFA member in the Los Angeles area, is a reporter on the LA Herald & Express.

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Link Aviation F-89D; jet flight simulator duplicating exactly cockpit of the F-89D interceptor; Link simulators for more advanced planes may not be shown.



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Remember—Airmen Are People

It is up to the unit commander to spearhead the reenlistment program. At first, this statement may appear to be a needless repetition of a regulation; however, a further study of the situation will indicate otherwise.

There are many reasons why a trained airman will not reenlist, but, I believe, a prime cause is that the serviceman is of the opinion that the USAF is not interested in him personally. Often an airman will not have an interview with the unit commander until the commander urges him to reenlist. This gesture is a hollow one after four years of comparative silence.

The commander, if at all possible, should welcome each new man into the squadron. This meeting affords a wonderful opportunity for him to be-

come acquainted with the airman, who will immediately feel at home. There is nothing wrong with a serviceman considering his unit a home away from home. It should be made clear that if any personal problem develops, the airman is free to contact the commander through the first sergeant. The commander should not delegate this authority; he is the only one who can fulfill this obligation to his men.

Another means available to convince the airman that the unit is interested in him is through periodic squadron briefings. The meeting is a fine method of informing personnel about unit policies, classification and promotion procedures, and the all-important finance regulations. The unit

commander can address the entire squadron and, in addition, authorities on personnel and finance matters can be called upon to answer questions.

Often problems cannot be resolved through squadron meetings. To offer a more intimate means of assistance, a unit board of key personnel, commissioned and non-commissioned, should be organized. The board would interview airmen with unusual problems and outline suggested methods of solving them. This board could also serve to counsel men who have been disciplinary problems.

The Reserve unit I served with on active duty utilized the foregoing methods with favorable results. A squadron commander does not own the unit but rather he owes each and every airman in it his fullest attention. Yes, airmen are people.

James K. McKillop

The Man Behind The Men

Let us for once identify the man above all others who is most actively insuring the high order of performance of every flying squadron. No enigma is really attached to his identification. Consider, if you will, a flying squadron, the organizational structure of which has remained basically the same. Within its component elements, imagine whose headaches never cease, who is never free from the inertia phenomenon present in so many forms, and who, above all, has the patience, the accumulated "know how," and the understanding which insures a never changing pattern of "Missions accomplished" . . . the Squadron Maintenance Officer.

His personal guardian is worry; his reward more of the same. His advisors are countless, but his helpers extremely limited. The materials with which he deals are readily identifiable, but interrelated and placed in service pose problems which defy attempts at orderly classification.

Recently, the writer completed an extensive trip, visiting installations operated by the most prominent of our major commands. As the purpose

of the trip was related to maintenance equipment matters, it was soon discovered that, while every command had its various echelons, each of which had some concern for aircraft maintenance, the heartbeat of operational maintenance activities was located in the immediate whereabouts of the maintenance officer, be it in his office, his shops, or among his birds. True to the breed of all busy yet practical men, he unfailingly found time to join with his hangar chief, line or crew chiefs, and others to discuss problems of mutual interest, to presuppose at length on less widely recognized engineering imponderables, and to discuss his requirements realistically. Everywhere there were no clocks, only astonishingly complex equipment, and frequently too few airmen to remain abreast of the daily workload requisites. In spite of the latter perplexing situation, the writer was not only impressed, but in many cases stirred, by the spirit of determination which characterizes the modern military "aero-repair leader."

Let's have a closer look at this man. Who is he, where has he been, and

why is his sense of duty so deeply ingrained? Call him Capt. Jim Plane, age thirty-two to forty. He has congenital indigestion and enough hangar space if he is fortunate. Through his myriad assignments from Templehof to Tokyo, his knowledge of aircraft has become amplified to the extent that recognizing system malfunctions and directing corrective action has become second nature. And what is so difficult about keeping a fire going in a pipe? Guess again. Intricate amplifier systems, electronic fuel controllers, yaw dampeners, differential pressure systems, thermocouple outputs, automatic nozzle controls, cascade effects, stator stalls, steering ratios, automatic stabilizing cycles, and porpoising tendencies are only a few of the components and operational considerations which make up the format of knowledge with which he must be equipped.

Today, within his organization, he has between 134 and 246 airmen, and depending upon the mission of his command, from twelve bombers or transports to twenty-five fighters or trainers. The continuing dilution of his airman strength by separation only means that those who remain must be encouraged to make up for the loss

of numbers and "know how" through long hours and precious few days of relaxation.

After deciding to stay in in 1946, he has lived through the almost complete conversion to gas turbine-powered aircraft. When he entered the business a pair of wings, a hankering to be around engines, and the well developed instincts of a born scrounger were about the only requirements for filling the job. Today, considering only the administrative responsibilities imposed upon his office, his job is a huge one. There are continuous inspections from all echelons of command. Everyone, it seems, is interested in his utilization rates, continuing supervision of the on-the-job training program, compliance with Tech Order directives, submission of URs, and his housekeeping endeavors. Inventories of his service stock pay scant attention to mission-hindering spare parts shortages, but woe betide him if his stock record cards indicate discrepancies within the inventory he has managed to accumulate. In spite of the never-ending impositions upon his time, he is respectful to the point of humility in seriously entertaining suggestions from any quarter which might conceivably aid the mission of his squadron. Having learned to rigidly discipline himself in the face of holding direct responsibility for the safe operation of equipment valued in many millions, he has developed executive talents which might well be emulated by many of his superiors.

He is never free from the burden of interorganizational transfer of aircraft, and all too often, after the painstaking program of maintaining one model engine has been moderately settled, the installation of a modified engine, complete with its own set of new bugs, is ordered. Always he must keep his organization combat-ready for a move to Thule, Yuma, or Africa. If a particular problem becomes manifest, such as an excessive rate of flame holder failure, perhaps he might have a visit from a staff man from higher headquarters. The guest, after familiarizing himself with the operating program of the squadron, might tell Captain Jim at the conclusion of his visit that if the explosion in the tailpipe were eliminated right prior to take-off roll, less strain would be imposed upon the ring (that happened this year).

It is true that factory tech reps are readily available. Nevertheless, to date, they have been unable to ascertain measures which will eliminate airborne flameouts, pilots landing on the other side of the fence, nor can they help to maintain stock levels or always secure vitally needed support equipment.

(Continued on page 77)

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ment. Tech reps cannot furnish answers to Accident Investigating Boards, nor inculcate inspiration in airmen who elect not to re-enlist at about the time they are beginning to grasp the true relationship between the importance of the turbine wheel and engine speed-heat ratios.

Upon whom, then, may it be said, rests more direct responsibility for the success of the Air Force mission? Deprived of his unselfish loyalty (surely though it would be unpardonable to refer to him in his presence as being unselfishly loyal) and his indomitable will to overcome the effects of the most tenacious problems, our Air Force would, in fact, cease to exist. As he does his own share of flying the line, it is no wonder that he is held in

such high esteem by his contemporaries. Is our hypothetical Captain Jim, as described, unusual? No, he, and those like him, are just a breed apart, who have learned to articulate in a demanding field, unemotionally, calculatingly, feeling no desire to participate in the decision-making staff meetings, or keep the social calendar in order. He is the modern counterpart of what a former air commander in Africa described as "that unwashed, unloved, unhonored son-of-a-bitch winning our war with his glue factory."

Remember, if you will again, the next time you see an account of a new transoceanic speed record by a flight of jets, or of an unusual bomber max effort mission, that credit is due many who made coordinated accomplish-

ment possible—the matchless crews, the designers of the thousands of components that go together to make a modern fighting plane, to those who maintain the navigation aids, and surely to the million-odd wives who suffer uncomplainingly in their hangars away from hangars.

But never forget that behind the men and machines, one man bore the responsibility for the operational performance of the aircraft, directed the preparations which went into their readiness, considered the mission requirements and the calculated risks involved, and may God be with the Maintenance Officer on the other end of the line who supervises the post flights on his planes.

Jack Elliott

Once Over Lightly

To begin with, I'd like to say a few words about the two very well-written articles by AFA President Gill Robb Wilson—"A Dangerous Calculated Risk" (October), and "Airpower's Hollow Shell" (November). It seems that Mr. Wilson has given considerable thought to his articles, and I hope our airpower planners devote as much. I dread to think of the possible results of further reduction of the Air Force's combat effectiveness.

The recent articles by Mr. Loosbrock, especially "Power of the Purse" (October), have been very enlightening. He presents a clear picture of the budgetary processes—something I have never before had an opportunity to know about.

AFA's 1955 Statement of Policy (October issue), contains a very potent paragraph—worth repeating here: "Step-ups in aircraft production without proportionate increases in the supporting establishment, including bases and trained men, do not result in greater combat strength. When war with modern weapons once begins, it is too late to start training crews and maintenance men or constructing bases. Even now, numbers of our newest aircraft are in temporary storage because of a shortage of trained personnel to maintain them." If this last sentence is true, who is responsible for this shortage of trained personnel, and what is being done to alleviate such a condition? I see highly trained, hard-to-replace, personnel getting out every month; and the biggest percentage of them are the most intelligent ones! What is wrong?

In reference to the AFA's stand on

various issues (page 28, October issue) I heartily disagree with one item; namely, the favoring of an increased proportion of the Air Force budget to expand the recruiting organization. Just a few minutes of meditation on this item will show the absolute uselessness of any recruiting organization at all, except on air bases. When an industry finds its business falling off, it doesn't expand its sales force, or build a more powerful propaganda machine. If it wants to remain in business it will find out what is wrong with its product, then work to improve it. My contention is that the recruiting offices in the major US cities are a complete waste of taxpayers' money. What better salesman could exist than the well-satisfied career airman? Find out exactly why (and not by using Womble-type committees—no airman is really at ease when talking to high brass) the men are leaving the Air Force, put the answers to practical use, and the base recruiting offices will be turning men away from the door! As an example, why not allow base of choice for men with over twenty years of service? I, for one, would be willing to remain several years longer for the chance to settle down in the area of my choice. Another pet gripe of mine is the Class Q allotment. In effect, it is like telling the NCOs that they are not capable of handling their own financial affairs; plus causing embarrassment when they are late.

The article "Principal Force" (October), was very good—only it didn't say much. Present-day morale wasn't mentioned; nor were any definite

answers given to problems posed by the author. I doubt if the re-up rate was very much influenced by either the pay increase or the "reversal in the trend to reduce fringe benefits." In the first place, the pay increase was very quickly absorbed by the higher costs of living; and in the second place, what reversal in fringe benefits? My wife's teeth are being neglected in favor of the children's teeth because we can't afford having all the work done by civilian dentists. Morale-wise, I'd like to quote an example—my own case: after eleven years of commissioned service, I was caught in that infamous blunder—the 1953 RIF—due to one unsatisfactory OER. This OER was based entirely on a personality conflict, and contained many opinions; but not one fact. True, I was required to endorse it, and in doing so, I practically accused my CO of falsehood and slander, but nothing ever came of it except a "Dear John" in reverse. I was a highly (and expensively) trained communications and electronics officer—today I am a lowly clerk. However, I'll string along—until my twenty years are completed! Every so often, the various service publications contain articles to the effect that there'll be no more RIFs, but the active-duty Reserve officers I have talked to simply don't believe them. That one action was the most damaging blow to Reservists' morale that could possibly have been dreamed up. Seems to me that it is about time to undo this damage. Insult was added to injury by the knowledge that trained, long-service officers were replaced by green ROTC kids, many of whom were only interested in getting their service obligations over with.

(Continued on following page)

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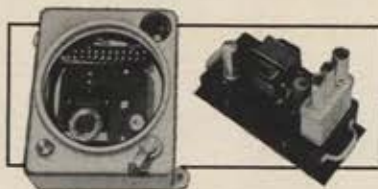
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JET BLASTS CONTINUED

Field Marshal Montgomery is to be very highly congratulated for his article "Tradition Versus Progress" (November). It is really a masterpiece of all time, and a very clear blueprint for the organization of our own military establishment. In only one aspect do I disagree—the civil defense organization should definitely remain under civil control, as the military has another mission to perform. I believe that one sentence in the section "Command of the Air," in the Montgomery article should be changed to read, "Victory in this operation will go to the side that is superior in executing superior *offensive* operations." His sections on "The Problem of Three Fighting Services," and "One Fighting Service?" are very clearly presented. I believe that we still have three services today only because of the traditions that each has built up. In any operation in which all three services participate, coordination can only be achieved by joint committees. This is still World War II thinking. It is rather doubtful that a thermonuclear scrap will wait for these committees to agree on each phase of operations. With *true unification*, a large cause of the wastage in present-day techniques—the various "service empires"—would no longer have reason to exist. As an example, there really is no *logical* reason why one agency cannot purchase all the foodstuffs, or medicines, or shells, for the entire US armed service (not services); nor is there any excuse for not having only *one* form for requisitioning purposes, or personnel reporting purposes, etc.

Another point in favor of one all-inclusive military establishment is the article on page 82 of the November issue, "Intelligence for Sale." The article contains a statement to the effect that thousands of pieces of factual information flow across a dozen control desks each day. In heaven's name, why? Inasmuch as the US has only one government, why not only one agency to dispense information?

Reference the article by M/Sgt. Frank Clifford, "How to Maximize Your Optimum Capabilities" (November), the Air Force would show a real stroke of genius by pinning stars on this man, and giving him the job of rewriting each and every Air Force publication into everyday English. Being only a lowly clerk, who has to decipher a considerable amount of correspondence and publications every day from as many as five, repeat, five different headquarters, I'm just the man to help him.

Sgt. B. Wildered

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WHAT THE AF-ROTC Cutback Means

The Air Force's action in dropping 23 schools from its ROTC program is less drastic than it may sound

By Edmund F. Hogan
RESERVE AFFAIRS EDITOR

THE AIR Force ROTC program is operating at 188 colleges and universities throughout the country. Over-all, it involves about 100,000 cadets. It involves, too, the assignment of 2,530 active-duty Air Force people to run the program—1,370 officers and 1,160 non-commissioned officers. It is a big program, and because it is the Air Force keeps it under close scrutiny.

Ten months ago Assistant Air Force Secretary David S. Smith notified the schools that "as a matter of sound management, the prudence of continuing the operation of units whose basic course enrollments show limited numbers of potential flying training applicants must be considered."

This consideration has been made and, as a result, the AF will drop twenty-three schools from its ROTC program.

The action is less drastic than it sounds. None of the colleges to be dropped will be required to discontinue initial enrollment of students into both the basic and advanced courses until the fall of this year. The close-out date for students enrolled in either course to complete their respective phases of the program is the summer of 1957. This means that students now enrolled in the advanced course at the twenty-three schools affected will be permitted to finish their ROTC training and earn the opportunity for a commission.

In round numbers, the cutback in the program will reduce the total of ROTC cadets by 5,000. It will return to the Air Force for assignment against world-wide commitments 103 officers—of whom fifty-four are in the field grades—and 108 non-commissioned officers.

The reduction did not surprise persons closely associated with the ROTC program. As early as 1953, Mr. Smith's predecessor, H. Lee White, told the colleges and universities that it would be necessary to consolidate the program to bring it within the general pattern of modern Air Force operations.

The White dictum is the cornerstone of current planning for the ROTC program. "The Air Force," Mr. White said three years ago, "has a mission and responsibility distinctly its own in our system of national defense. As the name implies, ours is a flying arm."

Taking off from this premise, Mr. White observed that the ROTC program was the only source from which the Air Force could hope to obtain the numbers of qualified young officers it needed to fly aircraft. However, he noted with some concern, few ROTC students were choosing to enter pilot training.

"Consequently," White said, "we have no alternative but to concentrate our major effort on students who are excellent officer material and who in addition are fully qualified for and will commit themselves for flying training upon graduation."

In support of this theme the Air Force then established two new requirements for admitting cadets into the advanced course. The first required cadets to pass the flight physical examination; the second required a passing grade in the Stanine test, which determines aptitude for flight training.

Then, a year ago, the Air Force called together an advisory group comprising representatives of thirteen educational organizations. Dr. Everett N. Case, president of Colgate University and representing the American Council of Education, served as chairman.

These educators threw their full weight behind the White philosophy enunciated two years earlier and recommended that units not meeting Air Force criteria for the ROTC program be dropped—provided the schools were given sufficient time to make a gradual transition and then only after the Air Force had re-evaluated each unit on the basis of fall 1955 enrollments.

The Air Force followed the educators' recommendation to the letter. Last August and September groups of officers visited the schools where doubt existed as to the schools' ability to meet established criteria. Enrollments were analyzed, along with past records and the reports of these visits. The result was the formal notice by Assistant Secretary Smith of the Air Force intention to terminate contracts with the twenty-three schools on July 1, 1957.

In 1952, before Mr. White announced that the ROTC program would emphasize procurement of flyers, only twelve percent of the graduates elected to take flying training. In 1953, the percentage doubled. In 1954, the figure jumped to fifty-four percent. Of those who will be graduated in the summer of this year, eighty percent have enrolled for pilot training.

Juniors and seniors enrolled in the advanced course will not be affected by the cutback. But those who cannot qualify for pilot or observer training may experience difficulty in obtaining a commission. Of 7,000 second lieutenant spaces available annually to ROTC graduates, 4,000 are reserved for pilot candidates and 1,500 for observers. Only 960 spaces are available for graduates in the engineering and technical fields and 200 for outstanding graduates. Another 300 spaces are reserved for veterans who complete the ROTC program.

Originally, it was not intended that ROTC graduates would serve on active duty. In 1952, with the passage of the Universal Military Training and Service Act, this traditional role was dropped in favor of the requirement that all graduates must take an active-duty tour.

In the original concept, the qualifications of graduates were not too important. But current requirements are for young pilots. The Air Force is certain it can get as many young flyers from 165 schools as it did from 188.—END

Cessna's CH-1 Performs Brilliantly In Army Tests— First helicopter to land on Pike's Peak

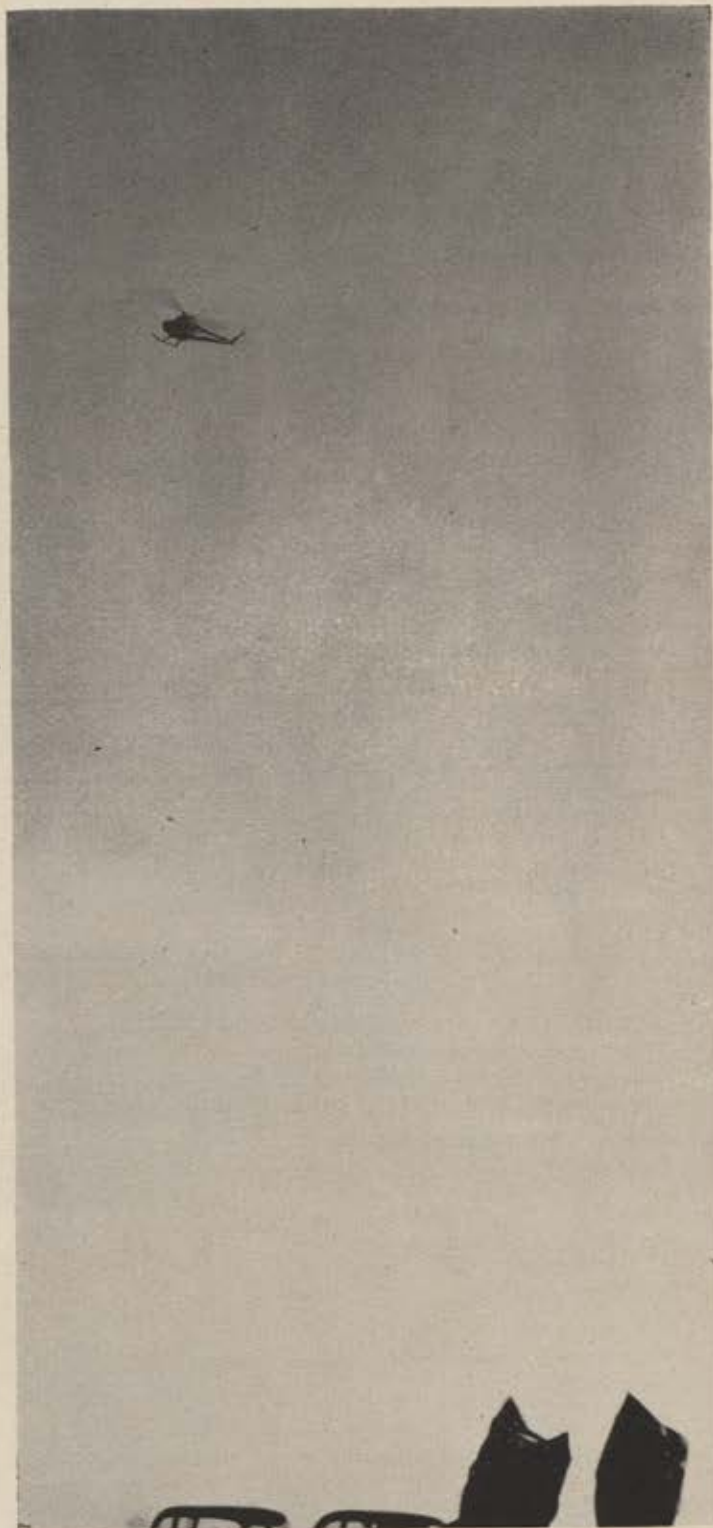
History was made September 13, 1955, when Cessna's new CH-1 helicopter landed on the summit of 14,110-ft. Pike's Peak. The event marked the first time a helicopter had landed on the famous peak and climaxed a series of Army evaluation tests for the highly functional CH-1.

Earlier that same day, the all-metal CH-1 flew to an altitude of 17,600 ft. over Colorado Springs. Then, after landing on Pike's Peak, the new helicopter, with three people aboard, hovered above the peak before flying back to the originating point of the Army tests at Camp Carson, Colorado.

The test results backed up Cessna's confidence in its new CH-1. It can climb from sea level to 10,000 ft. in less than 10 minutes. Over 120 m.p.h. speed gives the CH-1 highest top speed of any helicopter certified by CAA.



Cessna engineers and designers planned the new helicopter for maximum efficiency, low operating cost. The simplified mechanical detail of the revolutionary transmission, rotor assembly and drive system eliminates many extra parts requiring lubrication and service, cuts down on maintenance costs.



Its engine location—in the nose of the fuselage—is another example of the CH-1's functional design. Mounting the engine forward results in important savings in installation and servicing time, provides extra cargo, or passenger, space.

The excellent test performance of the CH-1 climaxes an intensive research effort by Cessna during the past three years. Military requirements call for the kind of performance the CH-1 can deliver. It is an important step forward in helicopter aviation. Cessna Aircraft Co., Wichita, Kansas.

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The AF's Unique Retraining Program

Operation SECOND CHANCE



Given a second chance to make good, three airmen take aptitude tests at the AF's Retraining Center in Texas.

By John G. Hubbell

AT AN overseas Air Force base early in 1954, a master sergeant with fourteen years of good service—including a brilliant World War II combat record—was court-martialed and convicted of larceny. He had gambled away money entrusted to him for safekeeping by some of his men. He turned himself in to his commanding officer almost immediately and later made restitution. Still, the Air Force could not pretend that a crime had not been committed. The sergeant was sentenced to two years at hard labor, forfeiture of all pay and allowances, and a dishonorable discharge.

Less than a year and a half later, at another base, the convicted larcenist made airman first class again. He is now performing a staff sergeant's duties and seems well on the way toward regaining his old rating of master sergeant.

At another overseas station, an eighteen-year-old airman was convicted of tampering with the mails and sentenced to two years at hard labor, total pay forfeiture, and a dishonorable dis-

charge. Now he is an airman first class at a US base and is up for promotion to staff.

An Air Force technical sergeant in a key security job was convicted of submitting falsified information to save himself work. He was given a year at hard labor and a bad conduct discharge. He is now in a new Air Force career field where he is considered a highly efficient staff sergeant; it is expected that he will soon make technical sergeant again.

These three men were reclaimed through a unique retraining program by which the Air Force offers certain of its military offenders a second chance to make good—in the Air Force and in society. The Retraining Center is at an Air Force base on the high, windy plains of the Texas Panhandle, twelve miles east of Amarillo. Since February 1951 nearly 3,000 convicted airmen have come to Amarillo. More than half of them have made good and are now successfully restored to active duty. Five years ago, before the retraining concept became a real-

ity, all of these men would have served out their punishments under the old-fashioned premise that the tougher stockade life was made, the harder they would try to avoid trouble in the future. When their term was up, more than half of them would have been returned to an unfriendly civilian society with bad conduct or dishonorable discharges; the rest would have been shunted to the bottom of the Air Force ladder, marked men, with no chance for promotion.

Stockade commanders and chaplains throughout the Air Force constantly look for prisoners who show signs of genuine remorse for their crimes and exhibit a sincere desire for a second chance to make good. These cases are sent to a screening board at Sheppard AFB, Tex. If the man passes the exhaustive screenings at Sheppard, he is ordered to Amarillo for retraining.

After a man has been saturated with retraining therapy, he faces a clemency and restoration board, which has thor-

(Continued on following page)



Roll call. Up at 5:30 each morning, the retrainees face a full day of rigid military, mental, and physical discipline.

oughly studied his entire life history. He is questioned closely. His progress and attitude are checked. The board determines whether he is now of any potential value to the Air Force. The board is coldly objective in its study of each case. It consists of three retraining experts who are used to dealing with human weakness and know when weakness is chronic. A fourth member, an officer from another squadron on the base, looks at each man with one thought, "Would I want him in my squadron?"

If the decision goes against the man, he is returned to a stockade to complete his original sentence, after which his punitive discharge will be executed. If restoration and clemency are granted, his sentence and discharge are remitted and he is returned—through retraining—to active duty in a career field of his choice.

To learn how retraining turns human tragedy into triumph, I went to Amarillo to watch the whole process from beginning to end. I sat in an office at the 3320th Retraining Group Headquarters with A/IC William H. Yelverton as he gave the initial retraining briefing to a new arrival.

The new trainee was a big man, and there were faded spots on his shirt sleeves where the master sergeant stripes had been. He was Negro, Protestant, and a high school graduate. He had a wife and four children. He had spent twelve years in the Air Force, and his conduct record had been perfect. The FBI reported that he had never been in any trouble as a civilian. Recently he had been master sergeant in charge of an Air Force stockade. One day, three prisoners goaded him unmercifully and finally drove him past his breaking point. The big man beat them up. He was court-martialed, convicted of maltreatment of prisoners, sentenced to eighteen months at hard labor, forfeiture of all pay and allowances and a bad conduct discharge.

For three months he had labored behind barbed wire and steel bars. Now he sat facing Airman Yelverton in an office at the 3320th Retraining

Group Headquarters, Amarillo AFB, Texas. He declined the cigarette Yelverton offered him and listened, tensely, as the briefing began.

"The Air Force has decided you are too good a man to lose," Yelverton told him. "That's why you're here. You've got one more chance to make good. If you take it, you'll get all the help you need, but it will be up to you to prove you are worth a second chance."

Then Yelverton posed the key question: "Do you want to be restored to active duty?"

It was not an easy question to answer. The man was thirty-eight years old. Even if he were restored, he would start all over, on the bottom rung of the enlisted man's ladder; and his chances of ever reaching master sergeant again seemed hopelessly remote. He might prefer to take his chances in civilian life. The entire tone of Yelverton's interview invited a frank answer.

The big man made his decision. He said he was willing to pay for his mistake, and he liked the Air Force. He wanted to finish his career and erase the blot of a bad conduct discharge from his life.

"Fine," Yelverton said. "You're a retrainee now, an airman on a restricted basis. There are no guns here. No guards, no steel bars, no fences. If you ever decide to go over the hill, US Highway 66 is less than half a mile away. No one will try to stop you. But before you go, please talk it over with someone! Every door in this Group is always open: if you want to see Colonel Borden, go right ahead—he'll be more than happy for a chance to talk you out of it. The Air Force doesn't want to lose you. Any questions?"

The big man had one worry. How could he support his family? Could he change fields? Could he maybe get

into electronics? And what was his chance of getting any kind of rating again?

"We'll get you a job within a few weeks," Yelverton promised. He explained that jobs in the base concession stands, bowling alleys, and officers' clubs were made available to men in his position; that he could earn up to \$90 a month and send it all home. Also, he could apply for training in electronics.

"Prove yourself here and you can have anything you want. If you are restored, whatever rating you make will be pretty much up to you," Yelverton said. "Do your job, stay out of trouble and you may be able to add a stripe every few months. You may not even have to sweat out the normal time-in-grade periods for promotion."

Yelverton looked at his watch, told the new retrainee how to find the chow hall, and asked him to come back after lunch. Another job of human reclamation had begun.

Men convicted of everything from absence without leave to grand larceny or possession of narcotics have been readied for another crack at active duty in the Retraining Center, when a review of their cases revealed extenuating circumstances. The retraining process does not attempt to rehabilitate the hardened criminal. It is designed chiefly for men who are still potentially valuable to the Air Force, themselves, and society.

"Most of the retrainees are youngsters," observed Col. David B. Borden, Jr., Commander of the Retraining Center. "And the reason most of them are in trouble can be traced to parental delinquency. The majority come from broken homes, or their parents have either over-indulged them or neglected them. Their sense of values hasn't been developed. Our job is to help them grow up, to make them take hold of themselves. Sometimes they take hold fast. Sometimes it's slow going."

One candidate for restoration was a twenty-four-year-old who had been

(Continued on page 89)

ABOUT THE AUTHOR

John G. Hubbell has been staff writer and associate editor of Minneapolis-Honeywell's Flight Lines since 1949. He has done free-lance articles for The Reader's Digest and SatEvePost.

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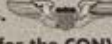
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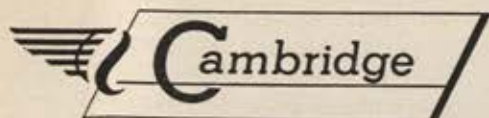


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convicted of stealing. He was a cold, hardened, irritable young man, a "loner" who distrusted people and, when trouble occurred, always blamed someone else. His opinion of larceny was that it was "convenient"—wrong only when a man was caught at it.

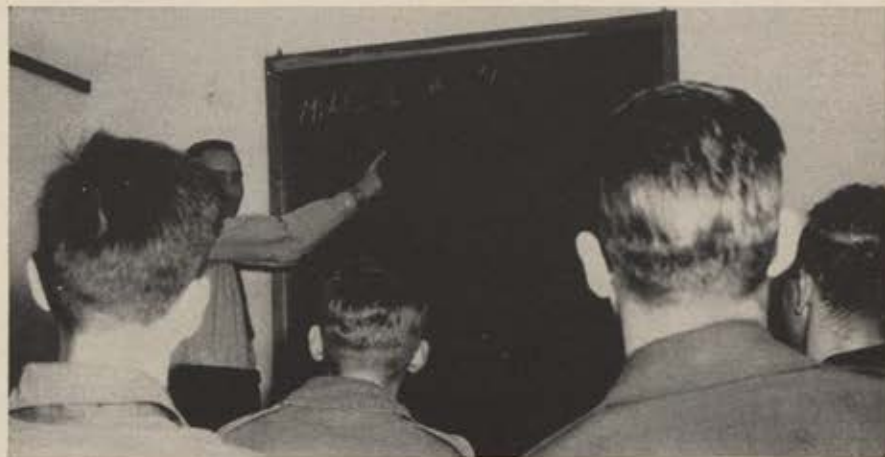
Everyone who talked to him saw him as a bad risk, but on a psychologist's hunch he was held for observation. The retraining experts dug into his past life. They learned that his parents had been divorced when he was an infant, that his mother had died when he was five years old. He had gone to live with a grandmother who never allowed him to associate with other children for fear that "something might happen to him." His father was an embittered, indifferent man who had little to do with him. The boy, dissatisfied and restless, had quit school at sixteen and gone to work. After failing at several jobs, he stole some money and went to Alaska. Two years later he returned to join the Air Force. Then he ran out of money and stole again.

The Retraining Center hit him with the full strength of its therapeutic muscle. Under constant counseling, he began to open up, little by little, to admit that it *might* also be his own fault that he didn't like people. As he lived day after day with other retrainees, he began to realize that he wasn't the only one with problems.

Gradually, his fellow retrainees noticed that the chip was going from his shoulder; that he was becoming more congenial, and would work hard on barracks details. His classroom work improved so much that he began tutoring others. When he was given a job on the base, his performance was rated "Excellent."

Finally, ten months after the boy had entered retraining, a Restoration Board read a new set of impressions from everyone who had worked with him. As in the beginning, opinion was unanimous—but the verdict was changed: "An excellent prospect for the Air Force; emphatically recommend restoration." He went back to active duty.

The key to the success of the Retraining Center is concentrated individual attention. The small, highly specialized staff never works with more than 250 men at once. The first two weeks are spent in interviews, tests, consultations. Then the program begins in earnest. Phase Two, which lasts three weeks, bears a striking similarity to basic training, with emphasis on citizenship. It is basic training, and it produces basic results when a man goes through it twice.



The retrainees bone-up on fundamentals of military life, including customs and courtesies, rules and regulations, and history and traditions of the AF.



Leathercraft at the Hobby Shop. Men are encouraged to develop hobbies.



Retrainees are given on-the-job training at the flight line on the base.

The retrainee is up at 5:30 every morning for a full day of rigid military, mental and physical discipline. After strenuous doses of calisthenics, flabbiness begins to draw into tight lines of muscle. He learns military drill all over again, and keeps at it until he marches and drills with precision. His barracks stand a white-glove inspection each day. If his room isn't spotless and orderly, ambitious plans are made for his free time at night. He learns, at daily personnel inspections, that he is expected to look slightly better than a recruiting poster. And that all appointments are made to be kept—on time! Gradually, he begins to acquire a sense of organization about his life, and learns that violation of rules which did not apply in basic training will result in his discharge—to make room for some other prisoner who wants to try harder.

In classrooms, retrainees relearn the fundamentals of military life: Customs and courtesies, rules and regulations, the structure, history and traditions of the Air Force; US citizenship, world government, current affairs; and, since

many men go haywire over marriage problems, the retrainee studies a course in marital relations.

Once a day he joins a group of eight or ten others in a classroom. For an hour they are free to discuss literally anything within decorum—something they saw on television, heard on the radio, read in a newspaper or magazine. They are encouraged to talk over their own problems with each other, and this is what they most often do. The new retrainee finds himself absorbed in another's troubles.

Soon he is offering his opinions, and arguing with the others. He compares another man's case with his own; before long he is telling his own story and hearing the others' ideas on how he should handle it. Now he *knows* he is not alone in trouble.

When the retrainee finishes Phase Two, it is his decision what happens next. If he hasn't completed his formal education he can go to school and work toward the equivalent of a high school diploma. Or he can go into on-the-job training in a career field for

(Continued on following page)



NEW SHAPES of things to come from Piasecki ...

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SECOND CHANCE—CONTINUED

which he has an aptitude. If his record warrants it, he can be sent to any of the three formal service schools at Amarillo AFB—Jet Mechanics, Airframe Repair, or Cooking.

When a man has done a satisfactory job in Phase Three for at least a month—often longer—he is advanced to Phase Four—the pre-release phase. Now he is practically a free man, but his instructors and supervisors check him more closely than ever. He is given more privileges—the run of the base every night until curfew, so long as he notifies his supervisor where he will be; and two visits a week in town. When he is given a pass into Amarillo, he will not drink, gamble, wear civilian clothes, associate with women, except at USO parties, or drive a car. An escort accompanies him, and his attitude and conduct are observed microscopically. How does he handle himself in this new freedom, in anticipation of even greater freedom? Does he stay sharp in his work habits, his study, his personal appearance, his living habits? Is he really a better man than he was when he came here? Retrainees who slip are set back into Phase Three.

While the retrainee must do most of the real work himself, he gets constant help from the on-the-spot therapy and counseling. It is no coincidence that he is always bumping into Colonel Borden, or one of the instructors. He gets used to talking with them in the driveways, chow halls, in front of the chapel, and answering their questions: "How's the job? How is school? Have you heard from your folks? Have you written them? Is there anything I can do for you?" He learns that they *really* want to know, *really* care.

But perhaps the biggest morale boost is given early. One of the first people the retrainees meet is a bright young airman third class whose duty it is to glean the skeleton facts of their social histories from them. As they warm up to their life stories, they frequently punctuate them with dark opinions, and often gloomily decry their chances for success. The airman puts his pencil down and takes time to tell them of a case he was particularly close to: his own. He once heard the president of a court condemn him to a year at hard labor, total forfeiture of pay and allowances, and a dishonorable discharge. Then, he points to a pennant behind his desk inscribed with the Retraining Squadron's Latin motto: *Fieri Potest*.

"That means 'It Can Be Done!'" he tells them. "And I know that it's true. I've done it!"—END



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Reserve Roadblocks

In the nine months since the National Reserve Act became law, millions of words have been written about the posture of the reserve components of the armed services. Almost everyone who has made an evaluation of this posture in public print has concluded that the reserve program is "lagging." The word may be descriptive of the Army reserve program, but it is a far cry from what actually has been transpiring in the reserve program of the Air Force. For, far from lagging, the Air Force reserve program has been making excellent progress. And yet strange things are happening in the Department of Defense which could cause the Air Force reserve program to slip—and badly.

The reserve program of the Air Force contemplates a total of 349,000 officers and airmen. Of this number, some 114,000 are individuals earmarked for specific slots in the active establishment. Progress toward the goal has been noteworthy, particularly since last August when the Air Force initiated procedures to assure that all Reservists would be in a "ready" category, instantly available in the event of mobilization.

The heart of the Air Force reserve program is combat-capability—not months after M-Day, but on M-Day. To help achieve this capability, six pilot training wings of the Air Force Reserve were converted to combat wings. A program was launched to produce 3,000 skilled reserve navigators. Seventeen Air Guard wings, which had a dual bomber and interceptor mission, were relieved of the bomber responsibility and assigned exclusively to Continental Air Defense Command for employment on M-Day. The Mission of the Guard was enlarged to include four air resupply groups and four air transport squadrons.

In the Pentagon, studies were made of the Air Force requirement on M-Day for individuals by occupational specialty and grade. Recently, Continental Air Command was given this M-Day requirement for both officers and airmen—by grade and skill. Thus, the Air Force knows now, based on the current war plan, what its individual needs will be in the event of mobilization.

Another important step taken was the development of a "selective assignment" program. Under this program, airmen released from the active establishment who have an obligation to serve in the reserve, are assigned selectively to the reserve units nearest their homes. These men, while not required to join the units, are urged to do so both to increase the combat-capability of the units and to reduce their remaining service obligation. One year with an active reserve unit will finish their total military service obligation. If they do not join an active unit, they are carried in the Ready or Standby Reserve—subject to call—for two years. It is estimated that by next June 30, some 29,000 of these airmen finishing four-year active-duty tours will have been selectively assigned. The majority are expected to join reserve units.

The reserve program of the Air Force has made such good progress, in fact, that last month a subcommittee of the House Armed Services Committee complimented the Air Force for what it had done these last nine months. And this progress seems to have been made in spite of, rather than because of, the Department of Defense.

Take, for example, the matter of facilities. Beginning with Fiscal Year 1951, the Congress appropriated certain sums to be spent for the construction of reserve facilities.

No single aspect of the reserve program is more important than facilities. Without a place where training can be given, or without airfields from which to fly, it is almost impossible to attract participants.

For the current fiscal year, Congress authorized the expenditure of \$32,049,500 for the construction of flying centers and reserve centers. But those who control the money in the Defense Department have thus far released only \$2,078,000 of these funds. The amount released was for the construction of flying locations, although the sum directed by Congress for this purpose was \$26,558,500. So far, Defense has not released any money for the reserve centers, although \$5,491,000 was earmarked for this project.



On "Clergy Day" at the Hensley Air Reserve Flying Center, Grand Prairie, Tex., area pastors take jet rides. Shown are Dr. R. Bruce Bannon, center, and Dr. Cecil E. Berry.

Recently, Assistant Defense Secretary Carter L. Burgess notified the Air Force that Defense had developed certain "guidelines" it wanted the Air Force to follow in its reserve training program.

The first guideline directed that the number of prior servicemen in pay-drill status, who had just joined the reserve following active-duty tours, be substantially reduced.

This would hit directly at the "selective assignment" facet of the program. It would mean asking the units to forego, in large measure, upgrading combat capability built around these technicians whose highly developed skills are still fresh.

It is an acknowledged fact that Air Force skills become rusty after a man is separated from active duty, unless he works at them on a fairly regular basis. The weekly and monthly reserve training assemblies were designed for just such a purpose—to prevent skills from becoming rusty. To achieve an acceptable degree of combat capability requires frequent training periods both for units and individuals. If the Defense guideline prevails, the end result will be a lowering of combat effectiveness.

Another guideline called for eliminating the week-night drills from all elements of the reserve, except for school periods for certain technicians.

This would hit squarely at the specialized training program. This is the program that trains Reservists in the skills needed to satisfy almost all of the mobilization requirement for individuals. More than five years of effort have gone into building this night-time specialized training of individuals. A conversion of the program to the

(Continued on following page)



In jet age program sponsored by East Alton's 9699th Air Reserve Sqdn. and 94th Bomb Wing, Scott AFB, at East Alton, Ill., junior high, McDonnell test pilots Ron Johnson (left) and Bill Ross show volunteer how 'chute works.



In same East Alton program, McDonnell engineer Parnell Schoenke demonstrates model of jet-propelled 'copter.

one- or two-day per month concept, which Burgess asked, could have a damaging effect on the willingness of individuals to take training.

The Burgess document went beyond merely directing that certain procedures be adopted in the reserve training program. It put the Defense Department squarely in the operating business. For it set forth to the last man the numbers of officers and airmen who could participate in pay-training status, how many drills and days of active duty they could have, average number of days allowable for transition of newly assigned pilots, etc.



Donald J. Strait, member of AFA's Air National Guard Council, replaces John I. Lerom as Deputy Assistant Secretary of the AF for Reserve and ROTC Affairs.

The document established a ceiling of fifty-two Air Guard officers who might serve on active duty under Section 5 of the National Defense Act and Section 252 of Public Law 476. And it further directed that these officers should be included within the active Air Force approved strength and paid from active Air Force funds.

The officers referred to are called to active duty and assigned within the Air Force as specialists in matters involving the Air Guard. While neither law provides specifically the source of pay for these officers, Public Law 476 did state that while on active duty under Section 252 these Air Guard officers should be considered as additional members of the staff they were assigned to.

If the Burgess document is peculiar in that it would serve to reduce combat capability, it is made more peculiar by the fact that it is directed to the reserve program of this fiscal year. In five more months this fiscal year will have ended. Further, it was issued months after Congress had appropriated for the support of this fiscal year's reserve program and almost eighteen months after the program had been submitted by Air Force to the Defense Department for approval.

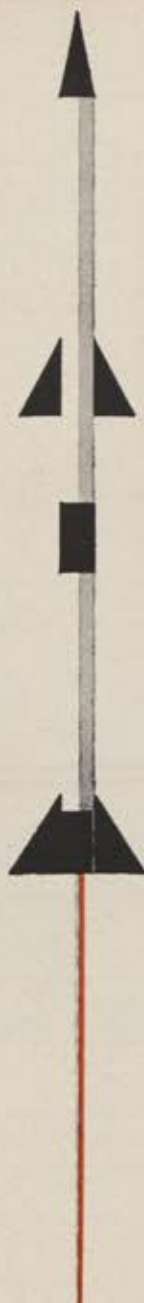
There are other indications that Defense is placing roadblocks in the way of the Air Force reserve program.

The Air Force has hoped for more than a year to institute an Air Technician program in its Reserve, similar to that in effect in the Air Guard for years. The Civil Service Commission has approved the plan, subject to approval of Defense. The program, which provides that key members of the unit are hired for full-time duty on a civilian employe basis to substitute for assigned active-duty people, would save millions of dollars annually and return to the Air Force for assignment against world-wide commitments hundreds of officers and airmen. Almost everyone concerned with the reserve program believes in the Air Technician plan implicitly. The Defense Department's own Reserve Forces Policy Board has approved the plan. But the Department itself has not given its blessing.

As long ago as last April the Air Force asked Defense for approval of thirty-six additional drills for rated people in the Reserve and Air Guard in order that they might better meet their minimum annual flying time requirements. Defense has kicked this request around for months, and its most recent suggestion was that ten additional days of active duty be given to all members of both reserve components.

There is an old saying to the effect that "what you do speaks so loud, I cannot hear what you say."

If this is true the actions of the Defense Department
(Continued on page 96)



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with respect to the Air Force reserve program would appear to belie the Department's announced public policy that it is striving for a truly Ready Reserve.

The new Deputy Assistant Secretary of the Air Force for Reserve and ROTC Affairs is Donald J. Strait of New Jersey, a member of the Air Force Association's Air National Guard Council.

Mr. Strait was appointed last month to succeed John I. Lerom, a member of AFA's Reserve Council, who resigned in December to accept a position with the Aircraft Nuclear Propulsion Department of the General Electric Company, in Cincinnati.

An Air Guard colonel, Strait commands New Jersey's 108th Fighter-Interceptor Wing. The thirty-seven-year-old jet pilot earned his wings in 1943 and served in World War II with the Eighth Air Force. He completed two combat tours in the European theater, flew 122 missions,



Industrial Mobilization Flight of Washington, D.C. Air Reserve Center hears a lecture by Lt. Robert S. Weinberg.



Sixteen WW II and Korea decorations finally catch up with Maj. Robert Y. Price, center, and Capt. James E. Zorn. Tenth AF CO Maj. Gen. Robert E. L. Eaton presents them.

and is credited with destroying thirteen enemy aircraft in the air.

The new appointee joined the New Jersey Air Guard when it was organized in 1946 and has been a squadron commander, group commander, wing executive and, finally, wing commander. He served twenty-one months on active duty during the Korean war, all of it with the 108th in the United States.

Strait has attended numerous Air Force schools, including the Tactical School and Air Command and Staff school. He completed the Air War College course last year.

The new Deputy Assistant Secretary is a senior pilot and holds numerous decorations, including the Silver Star and Distinguished Flying Cross with two clusters.

The 146th Fighter-Interceptor Wing, California Air Guard, is headquartered at Van Nuys airport in the San Fernando Valley. Rep. Joe Holt, the Congressman who represents that district, wishes it were elsewhere.

The Congressman has complained to the Department of Defense that:

The runway is 1,000 feet too short for the jets operating at Van Nuys;

The flying training program is poorly controlled; Aircraft take off two at a time on a sub-marginal field; ANG pilots are not sufficiently proficient to operate from the field;

And so forth.

And he has demanded that all federal funds for the



Lt. Col. David W. Price, left, and Lt. Col. Herbert M. Lapidus discuss plans for Industrial Mobilization Flight.

support of the unit be withheld pending "a reasonable plan of operations of which I personally approve."

The facts are that Van Nuys has a 6,000-foot runway, more than is required for the operation of F-86A aircraft which Guard pilots fly there. Five qualified pilots supervise the training program. The runway is 150 feet wide, considered well within the limits of safety for dual take-offs when the operating aircraft have a wing span of only thirty-nine feet. The proficiency of the unit's pilots has been established as equal to that of many pilots on active duty. In the first eleven months of last year, the period covered in the Congressman's complaint, the two squadrons operating from Van Nuys had only one accident. That was off the base and resulted in no damage to civilian property or injury to any person, other than the pilot of the plane.

Point by point the Congressman's charges can be refuted. But it is another straw in the wind that indicates the need for public understanding of the military requirement so that jet noise and jet bases cannot be made into commercial and political footballs.

Notes on the back of a Form 175. . . . Three types of trainers will be made available soon to ANG tactical flying squadrons. One is a capsule trainer designed to help pilots perfect high-speed ejection techniques. The second is a combined pilot and radar observer trainer, and the third is a trainer for radar observers only. . . . USAF Extension Course Institute has served notice that it will cancel out students who are not completing their lesson assignments.

—Edmund F. Hogan



TWO HEADS ARE BETTER THAN ONE

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Tech Talk

By Lee Klein

Air travelers anxiously awaiting the era of the **high-speed jet transport**, and people living near high-density airports uneasily eyeing the same, both had reason for hope with word from Boeing about progress on a **combination thrust-reverser and sound-suppressor**. The system can be installed as a unit (see cut) on the **Pratt & Whitney jet engines of the Boeing 707**, and, if flight tests are successful, go a long way towards solving what are generally considered the **two biggest obstacles** to regularly scheduled flights of high-speed jets, allowing them to **land on existing runways and quieting them down**. Receiving top priority at Boeing, the reverser has already been **taxi-tested** at speeds up to ninety-eight mph on the 707 prototype. The sound suppressor, part of the unit, **regulates mixture of the exhaust with the surrounding air** to produce less noise. It also **concentrates noise reduction** in those frequencies where reduction is most desirable. Officials claim the unit causes **no appreciable reduction** in engine thrust. Douglas and Pratt & Whitney are also at work on a solution to the same problems.

Plastic models of **artificial earth satellites** (see cut) have been put on display at New York City's Hayden Planetarium and Chicago's Museum of Science and Industry. The models were built by **Herbert R. Pfister**, associate editor of *Popular Science Monthly*, after consultation with scientists assigned to the satellite project. They are eighteen-inch spheres, fitted with electronic parts to **simulate instrumentation** that may be used in the real satellites.

As announced by the White House several months ago, the US plans to launch real satellites into 220- to 300-mile-high orbits during the **International Geophysical Year**, during 1957 and 1958. These will measure fourteen to twenty inches in diameter and may study such things as solar ultraviolet rays, electrical currents, and the drag of whatever air may exist at that altitude.

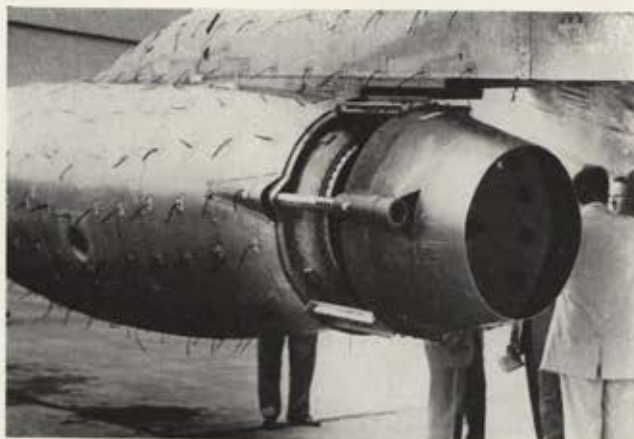
Even in an age when startling new developments in aviation are becoming almost routine, details of a **new concept of flight**, utilizing internal lift-inducing propulsion, created quite a stir among enthusiasts. **Dr. A. M. Lippisch**, originator of the delta wing design and the Messerschmitt 163, released some details of his **research on the Aerodyne**, a wingless and tailless

craft that can **take-off and land vertically**, hover like a helicopter, and **cruise like a conventional airplane**. Director of Aeronautical Research at the Collins Radio Co., Cedar Rapids, Iowa, Dr. Lippisch has built and flown models employing the system since 1952 and now is working on a **full-size experimental model**. Basically, the system works by sucking air into intakes in the front of the craft, passing it through a **blower arrangement**, and then **directing it as required**—through a venetian-blind-type of grillwork—for slow speed, hovering, or forward flight. According to Doctor Lippisch, "We are just scratching the surface. Others will have ideas that will im-

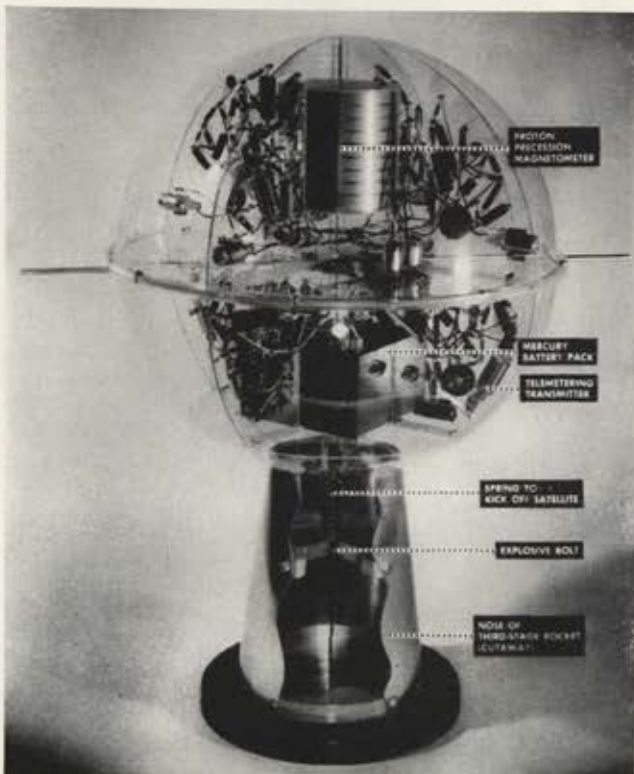
prove the design. But the important thing is that it is an entirely new concept of flying."

Fairchild's Aircraft Division has almost completed assembly of a **short take-off and landing (STOL) transport** that the company hopes will be able to operate in and out of a 500-foot clearing over a fifty-foot obstacle, and cruise at about 250 mph. Called the **M-232**, it is a twin-boom aircraft that weighs 7,000 pounds and is powered by 800-hp twin Lycoming SO-580 engines. Its **relatively large propellers** are capable of covering most of the wing with slipstream, and trailing
(Continued on page 101)

Experimental thrust-reverser installed on Boeing's 707 jet transport prototype was tested at taxi speeds up to 98 mph. Yarn tufts on the engine pod and supporting strut trace the flow of the exhaust gases.



Models of an earth satellite, built by Popular Science Monthly, are on display in New York and Chicago. They simulate the satellites to be launched by the US in 1957 or 1958 during the International Geophysical Year.



Popular Science Monthly photo by Hubert Luckett

10...15...20000 lbs of thrust 

*...the BIG news
in propulsion
will come from*



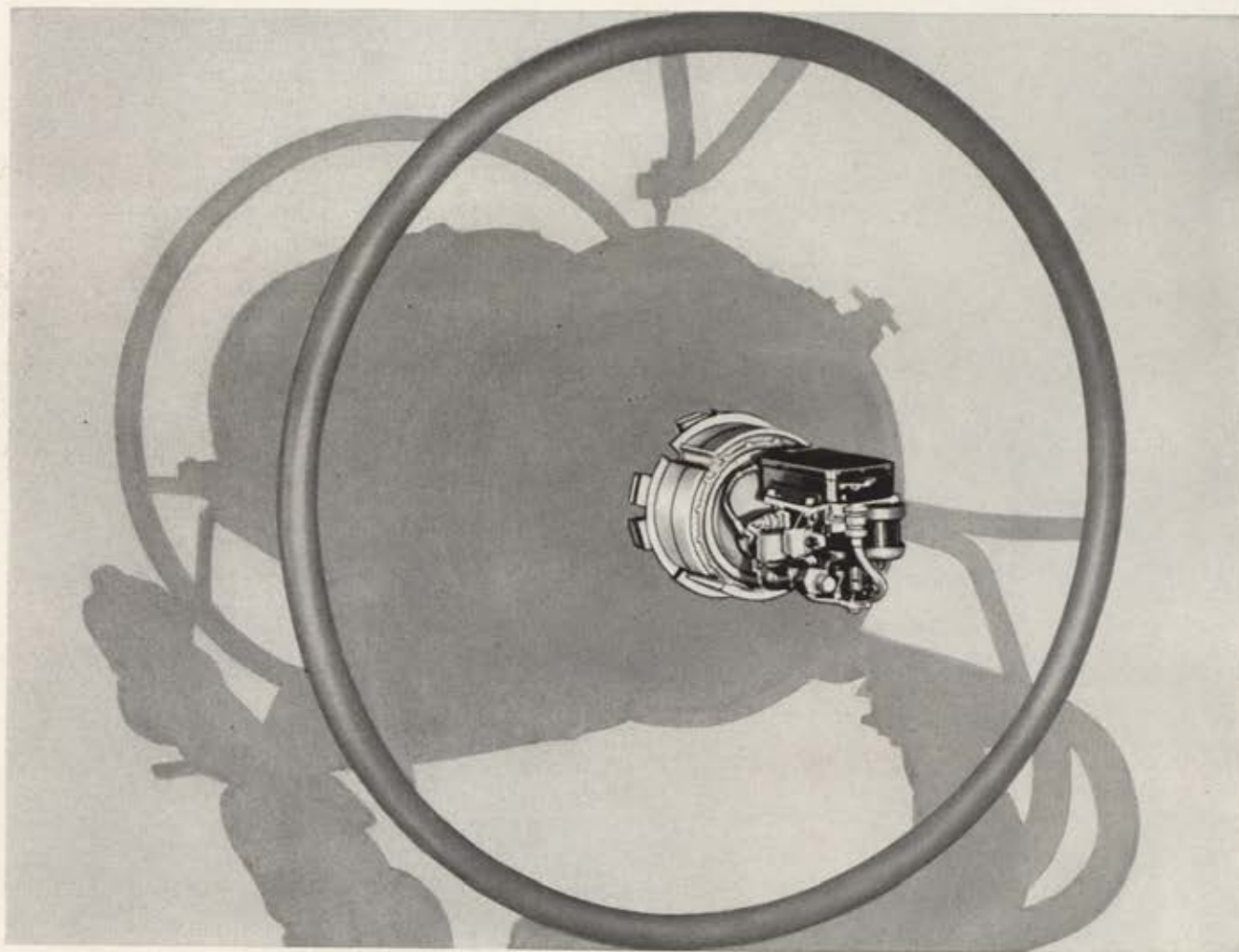
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edge flaps can divert some of this flow down to produce additional lift.

The old system of using a brilliant flash for night aerial photography will probably be eased out by an experimental system of continuous, high-intensity illumination developed by the Wright Air Development Center of ARDC. The system uses a high-intensity mercury arc lamp with an active element the size of a cigarette (see cut), to provide a narrow beam of light which is difficult to see from the ground. Used with aerial strip cameras which roll the film at speeds proportional to the speed of the aircraft over the ground, the light will illuminate the terrain at any given time.

The Fairchild Engine & Airplane Corp. now holds manufacturing and sales rights to two Dutch aircraft—a military jet trainer and a turboprop



John W. Beatty, an engineer at the ARDC's Wright Air Development center, holds the tiny bulb used in mercury arc lamp photo illumination system.



Night photo of a residential area in Dayton, Ohio, from 1,500 feet up. Three mercury arc lamps in the nose of a C-47 were the only illumination.



Fokker F-27
Friendship turbo-prop transport. It is powered by two Rolls-Royce Dart RDA-6 engines, carries 40 passengers.



Fokker S-14
two-place intermediate jet trainer. Powered by a Rolls-Royce "8" Derwent engine, it is in 450-mph class.

transport. The trainer is a 450-mph Fokker S-14 (see cut), two-place, intermediate jet, powered by a Rolls-Royce Derwent "8" centrifugal flow gas turbine rated at 3,470 pounds thrust. The plane has a wing span of thirty-nine feet, a length of forty-four feet, can take off over a fifty-foot obstacle in 3,300 feet, and climb out at 3,000 feet per minute. It has a maximum range of 600 miles without auxiliary fuel, at 25,000 feet altitude. Fairchild officials say the trainer is less complex and requires less maintenance than trainers currently operational.

The Fokker F-27 Friendship (see cut), is a high-wing, tricycle-gear,

forty-passenger transport designed for short and medium-range service. It is powered by two Rolls-Royce Dart RDA-6 engines, has a wing-span of ninety-five feet, is seventy-three feet long, and cruises at 270 mph. Richard S. Boutelle, Fairchild's president, said that deliveries could start in late 1957.

Boeing is offering a larger, longer-range version of its 707 jet transport to prospective buyers. Named the "Intercontinental," the plane will be able to carry as many as 145 passengers non-stop across the Atlantic, and will be slightly larger than the Douglas DC-8, which has been favored by some transatlantic carriers over the smaller Boeing 707. The new Boeing aircraft

will be powered by four Pratt & Whitney J-75 engines, which are said to deliver something like 15,000 pounds of thrust. The 707 will be powered by the 10,000-pound-thrust Pratt & Whitney J-57 engines.

"Utter bilge." That's what one astronomer called the idea of interplanetary travel. Prof. Richard Wooley, Britain's new Astronomer Royal, has told reporters, "I do not think anybody will ever put up enough money to do such a thing. If the next war could be won by the first chap getting to the moon and by that alone, some nation might put up the enormous sum required." L. J. Carter, secretary of the British Interplanetary Society, didn't agree with the professor. He said, "We believe that the first flight to the moon will take place within the next twenty years."

(Continued on following page)



The Army has bought twelve DeLackner Helicopter, Inc. Aeroceles for tactical testing. Powered by a 44-hp engine, it will fly at a top speed of 65 mph.

In a complete switch from the sequence you'd expect North American Aviation has used a dummy to duplicate an experience that had already happened to a human pilot. A steel-and-rubber replica of North American's test pilot George F. Smith—first man to live through an ejection at supersonic speed at a low altitude—was ejected from a rocket sled hurtling across the desert at Edwards AFB, Calif., at nearly 700 mph. The dummy was built to correspond to Smith's size and weight. It even wore the same kind of clothes he had on the day of his accident. The dummy's joints were tightened to the right amount of muscular resistance, and it was equipped with life vest, helmet, and oxygen mask before being strapped into the sled's ejection seat. The dummy's head and body were crammed with sensitive instruments, and a battery of forty-two cameras recorded movements and forces from the time the dummy was shot from the sled until it hit the ground (*see cut*). The tests were designed not only to substantiate previous calculations, but also to obtain additional information on exactly what happens to the human body when it is subjected to the tremendous forces of dense air at faster-than-sound speeds. While Smith recalled a "tumbling" sensation, the tests indicated that the body goes through a series of violent rocking, yawing, and arm-and-leg flailing motions.

Convair has also tested anthropomorphic dummies at Edwards AFB in an effort to gain knowledge that can be translated into life-saving improvements. For example, harnesses are being perfected to keep the pilot more firmly strapped until the right moment for his automatic separation from the seat, and new helmets—designed to afford greater protection from the terrific wind blast and supersonic noise—are being developed by human factors engineers at Convair.

According to a joint announcement by the AF and Convair, a B-36 equipped with an atomic reactor "has made numerous successful flights during which the reactor was operated." The B-36, based at Convair's Fort Worth plant, is used to "investigate the problems of shielding against radiation, to study effects of radiation on aircraft, and to development airborne nuclear instruments." The announcement said every precaution for public safety was taken and that the reactor isn't operated on take-off or landing, but only when flying over designated areas.

Meanwhile, at the AEC's Arco,

Idaho, reactor test station, a prototype of an atomic airplane engine is said to be ready for experimental use. It is only for testing on the ground and not an engine that could be mounted in an aircraft, but an actual engine could presumably be built along the same lines, utilizing the knowledge gained in the experiments. GE built the prototype.

The AF has announced development of an electronic system that has enabled observers to see the ground clearly from the air on a moonless night. Called an "optical amplifier," it is something like TV but many times more sensitive than the standard television camera. "It presents a cathode ray tube image not unlike a television picture," according to the Air Force. "Even when used under the poorest lighting conditions at night, it presents a clear, sharp picture." The idea has been perfected at ARDC's Wright Air Development Center, un-

der contracts to Westinghouse and RCA.

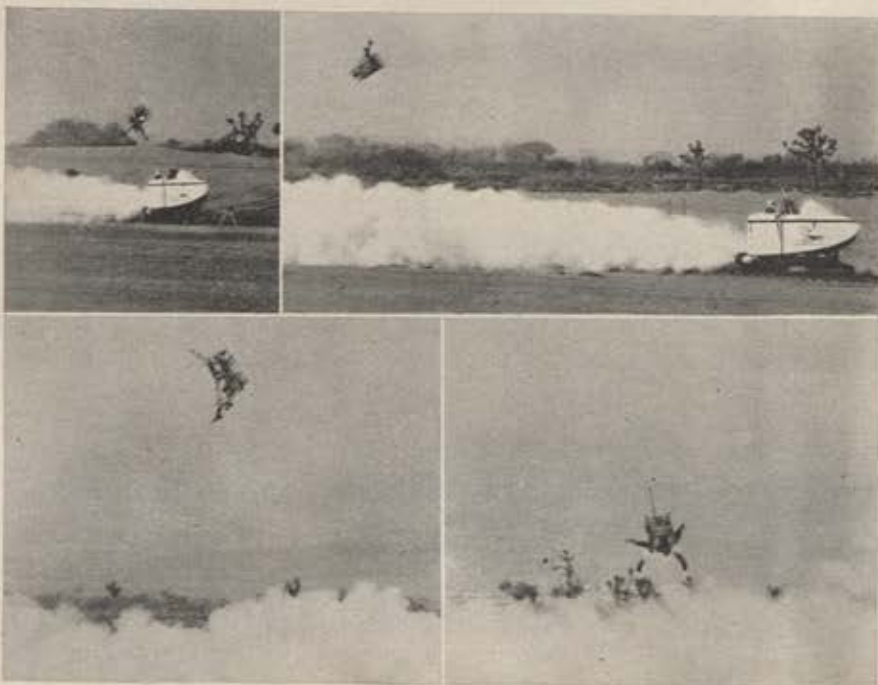
Beechcraft Aircraft Corporation says that its new Model 73 jet trainer can be used to train pilots from the start, without using any other airplane for previous training. The plane is a tandem-seat, two-place jet, powered by a Continental J69-T-9 engine. It will fly at 253 knots at 15,000 feet, stall at sixty knots. The Model 73s looks much like Beechcraft's T-34.



Beechcraft's Model 73 jet trainer during its first flight. The 290-mph tandem-seat two-place jet is powered by a Continental J69-T-9 turbojet engine.



Last-minute preparations for a rocket sled test of the Convair F-102A pilot escape system. The test sled is powered by 16 rocket motors.



In tests conducted by North American Aviation, Inc., a camera records the wild gyrations of a dummy duplicating the ejection of a pilot from an airplane flying faster than sound. In the two seconds of the sequence (from top left to lower right) the dummy is subjected to violent direction changes.

Missile Guidance by **Reeves** INSTRUMENT CORPORATION

IN U.S. NAVY'S FIRST GUIDED MISSILE SHIP

USS BOSTON, first of the U.S. Navy's guided missile cruisers, highlights another important advance in the continuing program of guidance systems development in progress at Reeves for the U.S. Navy Bureau of Ordnance.

Equipment installed in the USS BOSTON, born of successful experience with previous Reeves installations in USS MISSISSIPPI and USS NORTON SOUND, permits a new high degree of continuous precision control of the ship-to-air missile flight path right up to the moment of impact.

Reeves' work with the U.S. Navy and U.S. Air Force goes back to the earliest stages of their successful missile guidance programs. If you are concerned with the placing of prime or sub-contracts in the fields of missile or aircraft guidance, radar, gunfire control, servo-mechanisms or computer systems of any type, you should investigate Reeves' exceptional . . . and thoroughly experienced . . . research, engineering and manufacturing facilities.



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REEVES COMMAND GUIDANCE SYSTEMS
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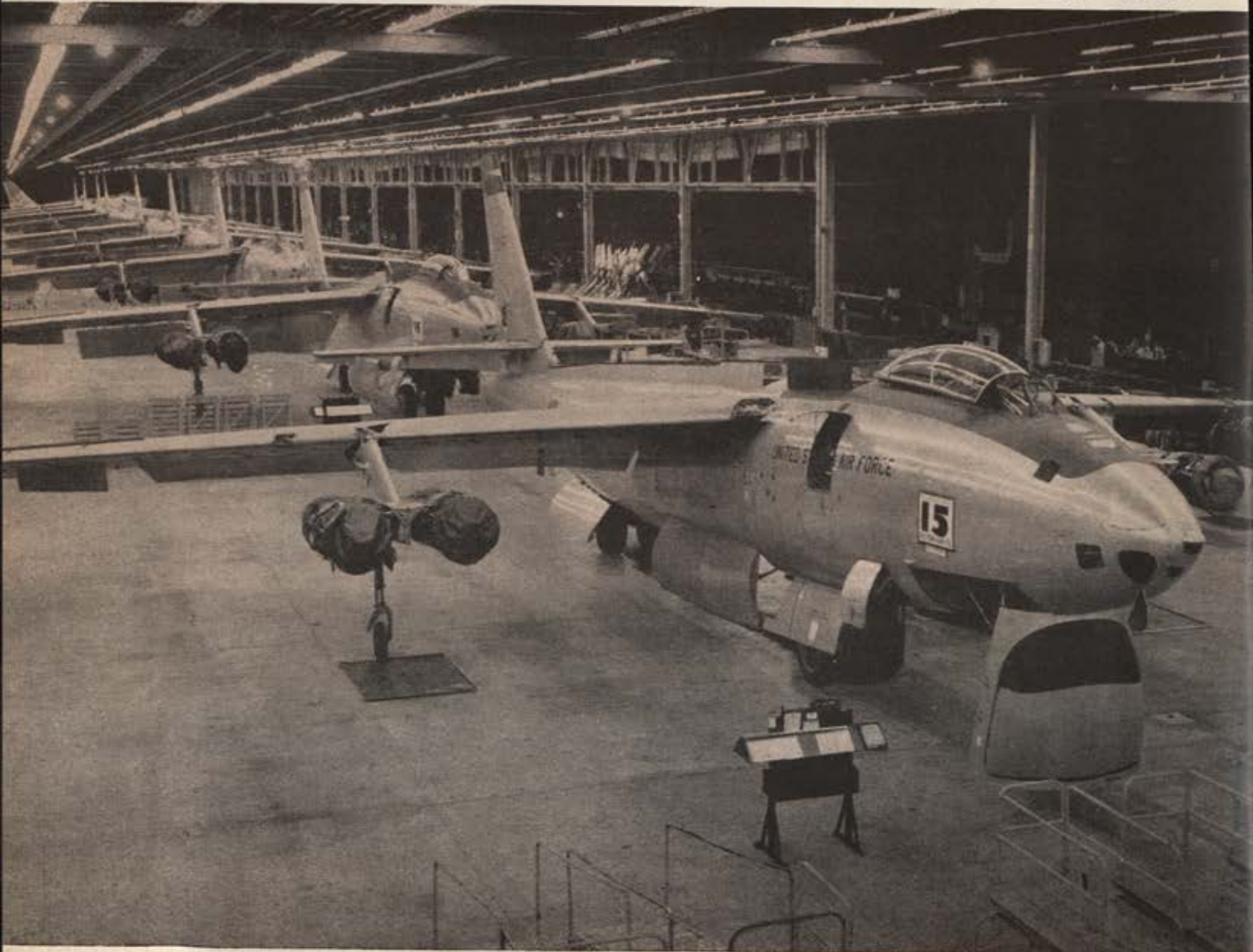
A Subsidiary of Dynamics Corporation of America
215 East 91st St., New York 28, N. Y.



A workman in one of Tinker's Maintenance Engineering shops gives a load of props a final inspection before they're put on planes.

OCAMA—
Oklahoma's
Biggest
Industry

Boeing B-47s are just one aircraft OCAMA has prime responsibility for. These '47s are lined up for major overhaul.



Where 'Tinker' Means Doing the Job Right

By Ed Mack Miller

ONE out of every 114 persons in the state of Oklahoma is employed at Tinker Air Force Base, outside Oklahoma City.

In the land of oil and Indians, the biggest single shop bears the sign: "OCAMA"—the Oklahoma City Air Materiel Area.

Oklahoma's largest industry is difficult, not only to describe but to understand, for the great buildings at Tinker house everything from the minuscule to the monstrous, from tweezer-bait up to and including Boeing's massive B-52. Fleets of jeeps, tugs, and trucks operate in the giant warehouses, only occasionally seeing the light of day.

Here is the biggest jet engine shop in the world, and in one overhaul line (under one roof) three-fourths of a mile of B-47s can be worked on simultaneously "bumper-to-bumper."

In fact, it's so hard to visualize that an auditorium-sized room at OCAMA contains an exact scale model of the jet engine shop so that the men who must guide the operation can puzzle out problems. This "Tinker Toyland" reproduces in scale nearly every lathe, press, drill, and hand tool in the shops, as well as the engines and even figurines of the workers themselves. One awed tourist said, "What a field day a Cub Scout troop could have in here."

OCAMA is one of eight Air Materiel Areas in the United States. These area commands (and seven specialized depots) answer directly to the head-

quarters of the Air Materiel Command, which buys, supplies, and maintains the aerial weapons and ground equipment required for the Air Force's world-wide mission.

OCAMA itself has a global job, as well as interior US zonal and area responsibilities. It has been assigned certain aircraft, engines, and accessories, and on these it has been charged with "cradle-to-the-grave" care.

For instance, OCAMA is "prime" on the Boeing B-47, and if a B-47 crashes anywhere in the world, an OCAMA team will be sent, if required, to find out why. If there was materiel failure, OCAMA works to find how it can be remedied.

Besides the B-47, this center is also prime on five other Boeing aircraft—the B-52, the B-50, the B-29, the C-97, and the KC-135—and on the Cessna T-37 jet trainer, several liaison types, and the Bomarc missile.

It is also prime on seven types of jet engines, four types of turboprop engines, and all airborne auxiliary engines; on O3-E turbo-superchargers, miscellaneous accessories, and certain types of pumps and hydraulic systems, in-flight refueling equipment, special tools, composition materiel, chemicals, and even on flags and insignia.

For the major tactical commands (Air Defense Command, Strategic Air Command, Tactical Air Command, etc.), this provides a single Air Force agency responsible for the logistic

problems associated with their aircraft. OCAMA works closely with the Strategic Air Command, for instance, since most of SAC's bombers and engines are prime with the Oklahoma City depot.

Under the "born-till-buried" concept, OCAMA will be responsible for seeing that the B-52 has full logistical support wherever it may operate until the last, obsolete '52 is retired and dismantled.

OCAMA's second mission is its zonal one. Under a policy of decentralization, the Air Materiel Command has divided the US into eastern and western zones. On items for which it has zonal responsibility, but for which an Air Materiel Area in the other zone may be prime, OCAMA is charged with depot maintenance, storage, and shipment. Specialized repair is provided in OCAMA's shops for many items for the western part of the United States. The A-5 system, which electronically controls the firing of guns on the B-47 Stratojet, receives specialized repair at Tinker. The fire-control system is prime, however, at the Warner Robins Air Materiel Area in Georgia.

OCAMA has "backyard" responsibilities, too. It must provide logistic support for an area covering Oklahoma, Arkansas, Kansas, Nebraska, Missouri, Illinois, Iowa, Wisconsin, Minnesota, and the upper peninsula of

(Continued on page 107)

"GIVE US A WEAPON... *ready to go!*"

These words characterize the Air Force's
Weapons System Concept

Photo courtesy
North American Aviation Inc.



It takes teamwork!

When the U. S. Air Force selects a leading airframe manufacturer such as North American Aviation to satisfy the demand: "Give Us A Weapon... Ready To Go", North American assumes the total system responsibility. Proper execution of such a responsibility involves a huge and complicated effort and requires the special skills of thousands of sub-contractors both large and small.

The total weapon system comprises major equipment systems such as fire control, navigation, flight control and engine control. Each must be adequate in itself and yet be compatible and closely integrated with the other systems in the total weapon. As one of the foremost designers and producers of major sub-systems and components, Servomechanisms plays a vital role in the weapons system concept. Our customers, the leading airframe and major system manufacturers, know they can rely on Servomechanisms to provide the proven engineering and production experience necessary to fulfill their exacting requirements so that they can satisfy the demand: "Give Us A Weapon... Ready To Go".

The Range Servo Analog Computer

...Over twenty-five different versions have been assembled from a few basic "building block" components. Each version is tailored to meet the specific requirements of a particular aircraft. In every version the amplifier, power supply and modulator are the same components.

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COMPONENTS DIVISION —
625 Main Street, Westbury, New York



LEFT: The Enola Gay, shown at Tinker in 1946, was modified in OCAMA shops before it dropped A-bomb on Hiroshima. CENTER: One of the bin rows in Tinker's 400,000-square-foot warehouse, acknowledged as one of the AF's most modern. RIGHT: This 339,000-square-foot warehouse at Tinker is probably the most highly mechanized structure in the Air Force.

'TINKER'

CONTINUED

Michigan. It is charged with solving any supply or maintenance support problem in the area. For instance, OCAMA handles much Strategic Air Command equipment on a global basis, is responsible for depot maintenance, storage, and shipment of many property classes that affect SAC on a zonal scale, and in its own area has many SAC bases, including the striking arm's headquarters in Omaha.

To carry out these manifold responsibilities OCAMA is organized along function lines into three principal operating directorates: Maintenance Engineering, Supply and Services, and Procurement and Production. These are called "mission directorates," and they function in this manner: Supply decides how much must be bought; Procurement buys it; Supply controls the storage and distribution; and Maintenance Engineering arranges to do the work involved in maintenance and modification.

OCAMA's main link with the aviation industry is the Procurement and Production Directorate, which regularly is involved in better than 20,000 contracts totaling approximately \$15 billion. Responsible for the purchase of about a quarter of a million items, this unit also is charged with the checking of quality, monitoring production schedules, and handling of contract administration.

To aid small business concerns win Air Force contracts, it operates "Small Business" offices at Tinker and at offices in Air Procurement Districts (OCAMA has people regularly stationed in seventeen states and carries on activities at 1,138 points; altogether about one-fifth of OCAMA's personnel is scattered throughout the US), the Procurement Districts that OCAMA operates being administered from offices in St. Louis, Milwaukee, and Chicago (with sub-offices in Minneapolis, Wichita, and Kansas City).

OCAMA's Supply and Services Directorate maintains in readiness approximately 337,000 different items with an estimated value of \$1.5 billion. This inventory is needed because Supply is charged with both initial sup-

port and follow-on support of prime items. It must see that Air Force commands have everything they need to do their jobs. To fulfill its world-wide responsibilities, Supply is kept informed of every item, the lack of which may have grounded any of OCAMA's prime aircraft.

And, if this isn't enough of a job, OCAMA is charged both with the support of the thirty friendly nations participating in the Mutual Defense Assistance program and the administration of the industrial machine tool storage program for the entire Air Force.

The largest of the three mission directorates is Maintenance Engineering, which employs about 12,000 persons. All told, nearly 21,000 civilians and 4,000 military make up the complement at Tinker, with the larger number of military personnel being employed by other Air Force organizations based at Tinker, including ADC's 33d Air Division, SAC's 506th Strategic Fighter Wing, the 1800th AACS Wing, the 6th Weather Squadron, and the 2905th Air Depot Group—Mobile.

In accordance with policies established by Hq., AMC, Maintenance Engineering controls the distribution of the workload for prime items, deciding whether the work will be done at an Air Force depot (including the one at Tinker) or at a commercial contractor plant.

In spite of its huge volume of overhaul and modification work, OCAMA's Maintenance Engineering work force has been reduced to a minimum nucleus. The work force, employed primarily on one shift, is utilized to: 1) do high priority work of special military significance; 2) perform those jobs that would be exorbitantly costly to contract; and 3) absorb the peaks of a fluctuating workload.

A good example of how the three mission directorates cooperate to subcontract workloads to commercial operators is shown in the unusual contract let to a Dallas company.

In March 1955 Southwest Airmotive Company, located at Love Field,

was declared the bid winner in the first jet engine overhaul program ever attempted outside the facilities of engine manufacturers or the military.

The contract, which called for the overhaul of more than 1,200 Allison J-33s (at a cost of approximately \$3,000,000), pointed up the fact that the Air Force was both training and implementing small businesses throughout the country—just in case.

Although the contract was the first ever let to a commercial operator for the overhaul of jet-type engines, the move was not as radical as it seemed, for Southwest Airmotive (called "Private Flying's Biggest Filling Station"), in addition to its experience in the overhaul of civilian aircraft engines (it claims to have reconditioned more civilian powerplants than any other shop in the world) was just phasing out a USAF contract under which it had reworked some 6,000 P&W R-985, Franklin, Lycoming, Continental and Jacobs engines.

The contract specified that Southwest would have only five months to tool and train for the program. This would not have been a major obstacle if Southwest had not been notified by the city of Dallas that a new terminal building was to be constructed on the site of the company's offices and hangar area.

And so, concurrently with planning a \$1 million expansion to handle the military contract (which entailed enlarging the company's Engine Division at Love Field to 100,000 square feet, the building of a 10,000-square-foot test and shop building at Amon Carter Field between Dallas and Fort Worth, and the building of a 15,000-square-foot addition at Love to house the compressor spin pit and balancing department and the accessory overhaul and test department), Southwest also dug one of its four big metal hangars up by the roots and moved it bodily across Love Field's runways to the opposite side of the field and embarked on a big expansion of its civilian service, repair, and overhaul facilities.

(Continued on following page)



TOP: After a test hop, AF Capt. Bill McLamore gives clean bill of health to J-33 jet engine overhauled by Southwest Airmotive.

CENTER: Maj. Gen. William O. Senter, OCAMA Commander, pays a visit to the Southwest Airmotive Company's jet overhaul plant.

BOTTOM: Workers in Southwest's plant. This jet overhaul contract is the first given by the Air Force to a commercial operator.

By "deadline time" of July 31, 1955, Southwest (aided by a hard core of OCAMA experts) was in business, for it had delivered its first jet engine by July 23 and in the following week had attained its initial monthly quota.

A good index of OCAMA's diversified workload is the tremendous number of long-distance phone calls ganged into Tinker each day. An Air Force Base in Michigan needs a crash boat repaired. A flight simulator at Offutt AFB in Omaha is acting up. A B-50 has crashed in Morocco. A teletypewriter in Wichita has broken down, while in Japan a SAC bomber group says too many of its planes are developing fuel-cell leaks. A crew must go to an overseas depot to train a cadre of airmen in the repair of jet engines. An Air Guard unit needs cash to repair the engine on a fire truck because it will be cheaper to do it locally. And every hour of the day an airplane goes back in commission somewhere because of OCAMA.

OCAMA is a complex operation, but it is not without a heart. At Tinker nearly one-fifth of those employed are physically handicapped. All workers involved in hazardous jobs are provided with handsome horn-rimmed glasses. If the person already wears glasses, he is given a pair of prescription "cheaters"; if he doesn't ordinarily wear them, he is given a pair of "plainos"—non-corrective glasses used solely for protective reasons.

Oklahomans must like OCAMA pretty well because a high percentage of Tinker workers have been working at the base since it serviced B-17s and B-24s in World War II (the first plane to drop an atom bomb on an enemy target, the B-29 "Enola Gay," was modified for its Hiroshima mission at Tinker).

Commander of OCAMA is Maj. Gen. William O. Senter, a native of Stamford, Texas, who attended Hardin-Simmons University and was graduated from the United States Military Academy in 1933. Receiving his pilot's wings in 1934, General Senter specialized in the study of weather, moving forward in this field until, in 1950, he was made chief of the Air Weather Service. He assumed command of Headquarters, Oklahoma City Air Materiel Area, in May of 1954.—END

ABOUT THE AUTHOR

In recent months hardly an issue of AIR FORCE has appeared without at least one article by Ed Mack Miller, about our most regular contributor these days. He's a freelance who calls Englewood, Colo., home. A Colorado Air National Guard captain, he's also president of the Colorado

Authors' League and on the Board of Directors of the National Writers' Club. His more recent offerings for us include "Strange Birds" last month, "The SAC World Series" in December, "The Hike of the Horrible Hunger" in November, and "Thunderbolt Geometry" in September.

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THE BACKING OF AN ESTABLISHED
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SERVICE ORGANIZATION,
ALL OVER THE WORLD,
WHEREVER PEOPLE FLY

... ANOTHER REASON WHY THE LEADING
EXECUTIVE AIRPLANES FLY WITH
CONTINENTAL POWER

AN ENGINE REMANUFACTURING SERVICE THAT SAVES YOU TIME AND MONEY

Continental's Engine Remanufacturing plan gives you a new factory remanufactured engine—back to zero hours and with factory new engine guarantee—at low fixed cost, with virtually no dead time . . . Ask your Continental Motors service station about this Continental-pioneered program which boosts the utility of aircraft—stimulates their wider use.



Continental Motors Corporation

AIRCRAFT ENGINE DIVISION

MUSKEGON • MICHIGAN

"For Want of a Nail..."

*For want of a nail the shoe is lost,
for want of a shoe the horse is lost,
for want of a horse the rider is lost.*

George Herbert's statement applies to electronics today as it did to riders three centuries ago. The point may be illustrated by considering a vital electronic unit made up of thousands of components. If the least of these components fails, the whole unit may fail—and with it a strategic military mission.

The problem of *reliability* is becoming increasingly important as the science of electronics advances. "Black boxes" are hard pressed to perform more complicated tasks with increasing efficiency. And at the same time, the requirements call for smaller dimensions. Notwithstanding environmental extremes of an order hitherto unknown, every

resistor, capacitor and relay *must* perform *reliably*. Each "nail" is critical.

That is why RCA is continuing its vigorous search for ways and means to increase the reliability of every component in an electronic unit. This program never ceases. It follows through from design to field evaluation. Everything learned is immediately applied to current development and production.

In seeking a degree of electronic perfection never before attained, RCA joins hands with others in this field. This matter of *reliability* is an industry challenge to be met by ingenuity, brain power and engineering knowledge wherever it is found.



DEFENSE ELECTRONIC PRODUCTS
RADIO CORPORATION of AMERICA
CAMDEN, N.J.

'Mitchell Skyroad' Takes to the Air

A SCROLL COMMEMORATING BILLY MITCHELL STARTS ON ITS WAY TO 30 AMERICAN CITIES

The "Billy Mitchell Skyroad," an air route linking thirty major American cities along commercial airline routes, was established in December under AFA sponsorship. A scroll commemorating the so-called "Father of Modern Airpower" was first signed by the Mayor of Los Angeles, then sent on its way around the country, city by city, on regular commercial flights. The scroll's first stop was Phoenix, Ariz. From there it went to El Paso, San Antonio, and Beaumont, Tex.; New Orleans, La.; Jacksonville, Fla.; Atlanta, Ga.; Greenville, S. C.; Charlotte, N. C.; Richmond, Va.; Washington, D. C.; Baltimore, Md.; Philadelphia, Penna.; New York and Buffalo, N. Y.; Cleveland, Ohio; Detroit, Mich.; Chicago, Ill.; Milwaukee, Wis.; Des Moines, Iowa; Omaha, Nebr.; Cheyenne, Wyo.; Denver, Colo.; Salt Lake City, Utah; Reno, Nev.; Sacramento and San Francisco, Calif., and then back to Los Angeles.

In each city AFA representatives met the plane bearing the scroll. They delivered it to the local mayor for his signature, and then placed the scroll on another flight bound for the next city on the Skyroad, thus tying all thirty localities together in a common tribute to one of American airpower's mightiest figures.

Bill Barcoff, Los Angeles AFA Group Commander, and Miss Ruth

Mitchell, sister of the late general, were among those who saw the send-off on December 21 from Los Angeles. Just before the scroll was put aboard the plane, a plaque was dedicated in the terminal at Los Angeles International Airport, proclaiming that city a terminus on Skyroad. Guests at this

At dedication of a plaque to Billy Mitchell at Burbank's Valhalla Cemetery—Bill Barcoff and Brig. Gen. and Mrs. C. A. Shoop. General Shoop is CO of California's 146th Fighter-Interceptor Wing, Air National Guard.



Calif. ANG Photo

ceremony included Gary Cooper, who portrays Mitchell in the new Warner Brothers film, "The Court-Martial of Billy Mitchell," and Milton Sperling, producer of the movie. Both Cooper and Sperling, and Miss Mitchell, were made AFA members.

An outstanding example of devotion to duty and pride in service was

demonstrated in St. Louis by Lt. Joseph C. Michel, USAFR, who died in December of leukemia. Lieutenant Michel contracted the disease while a senior in the first AF-ROTC class at

(Continued on following page)



Gen. George C. Kenney, center, a recent Seattle visitor, is shown here with Claude League, TWA Manager and Seattle Squadron member and Cadet Col. Jack R. Banks, University of Washington AF-ROTC, in new Aviation Club.



Before his death from leukemia, Joseph C. Michel is sworn as a lieutenant, USAFR, by Col. Harry Burkhalter as Mrs. Michel watches. Michel made outstanding contributions to Reserve in St. Louis, was an AFA member there.

SQUADRON OF THE MONTH

San Francisco Squadron
San Francisco, Calif.

CITED FOR

its outstanding series of monthly luncheon programs and its modern approach to a new programming schedule for the future. The "new look" is attracting much public attention in the Bay Area.

The Greater Miami Squadron, under the able direction of Ted Koschler, sponsored a luncheon program in December honoring Dr. John F. Victory, Executive Secretary of the National Advisory Committee for Aeronautics (NACA). Some sixty guests attended, and heard Dr. Victory discuss some of the problems of high-speed flight (see cut).

Among the guests were Alex Morphonios, AFA Vice President for that region; Maj. Gen. Hugh Knerr (USAF, Ret.); Grover Loening, an aviation pioneer who was recently honored at the Wright Day Dinner in Washington, D. C.; Col. Hadley B. Elikor, Commander of the 2585th Air Force

Chase; Lt. Gen. Charles B. Stone, III, new ConAC Commander; Nebraska's Gov. Victor E. Anderson, Omaha's Mayor John Rosenblatt, and Msgr. Nicholas H. Wagner, Director of world-famed Boystown.

Kansas City's Mohawk Squadron is another AFA unit undertaking an "Airman of the Month" program, and has gone about it in a most ambitious manner.

The Squadron's officers calculate that it costs about \$100 a month for the program, under which an airman is chosen on the basis of individual merit and made a guest at various functions for an entire weekend. In

Day observance. In addition he has also spoken before four different groups in New York City.

President Wilson's future schedule promises to be even more active, since the season for Wing Conventions is coming up, and he has been invited to address many of them.

Several AFA Wings have announced plans for their 1956 Wing Conventions. The dates and locations announced so far are:

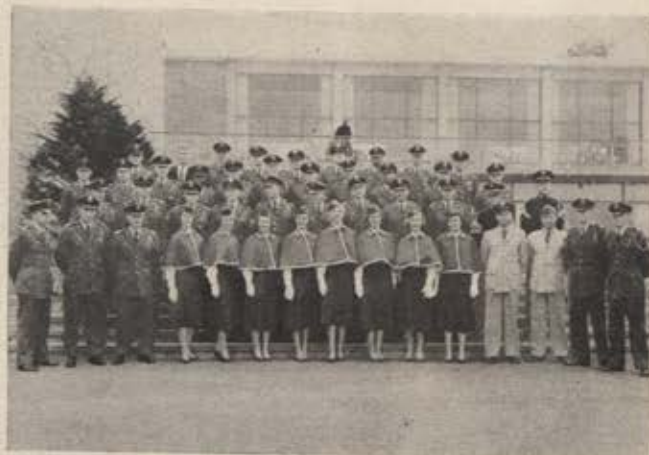
California, in Long Beach from April 20 to 22.

Maryland, in Baltimore, on March 11.

New York, in NYC, on May 12.



Dr. John F. Victory, Executive Secretary, National Advisory Committee for Aeronautics, addressed Miami Squadron members and guests in December. Also shown are Squadron Cmdr. Ted Koschler and Regional V-P Alex Morphonios.



Penn State University Arnold Air Society Squadron played host to representatives of three AAS areas in December. Cadet Col. John Lyons, host Commander, is shown 2d from right. National Commander Gib Petrina is 2d from left.

Reserve Center; and representatives from many aviation interests in the South Florida area.

Arthur C. Storz, recipient of AFA's highest individual "family" award as "AFA's Man of the Year" for 1955, was the guest of honor at a testimonial dinner in Omaha, his home, in December. More than 500 people attended the dinner, which was sponsored jointly by the Ak-Sar-Ben AFA Squadron and the Omaha Chapter of the National Aeronautics Association in testimony to Storz's many contributions to the growth of aviation in the area.

Gen. Curtis E. LeMay, SAC Commander, honored Mr. Storz by presenting him with a trophy. The main speaker of the evening was a native Nebraskan, David S. Smith, Assistant Secretary of the Air Force for Manpower. Other honored guests were Gen. Carl A. Spaatz (USAF, Ret.); Sen. Roman Hruska, Representatives Robert D. Harrison and Jackson B.

order to raise money, the Squadron has written to various business firms, agencies, and individuals, asking either donations or accommodations for the winner and, if he's married, his wife.

Fred Betts is the Squadron Commander, and a good deal of the work on this program was done by Maurice Smith, a Councilman of the Squadron.

Since the last report in this column of his activities, AFA President Gill Robb Wilson has been in several more states, talking about AFA and airpower. His recent travels have taken him to Hagerstown, Md., for the Charter Night dinner of the new Squadron there; to Washington, D.C., for three separate functions—an address to the Washington Ad Club, a conference of Information Services Officers from all over the world, and the December 17 meeting of AFA's Board of Directors—to Quebec, for an address to the Canadian aviation industry representatives; and to Dayton for the annual Wright

Ohio, in Dayton, on May 5 and 6. Massachusetts, in Boston, on June 2 and 3.

Illinois, in Chicago, on June 2.

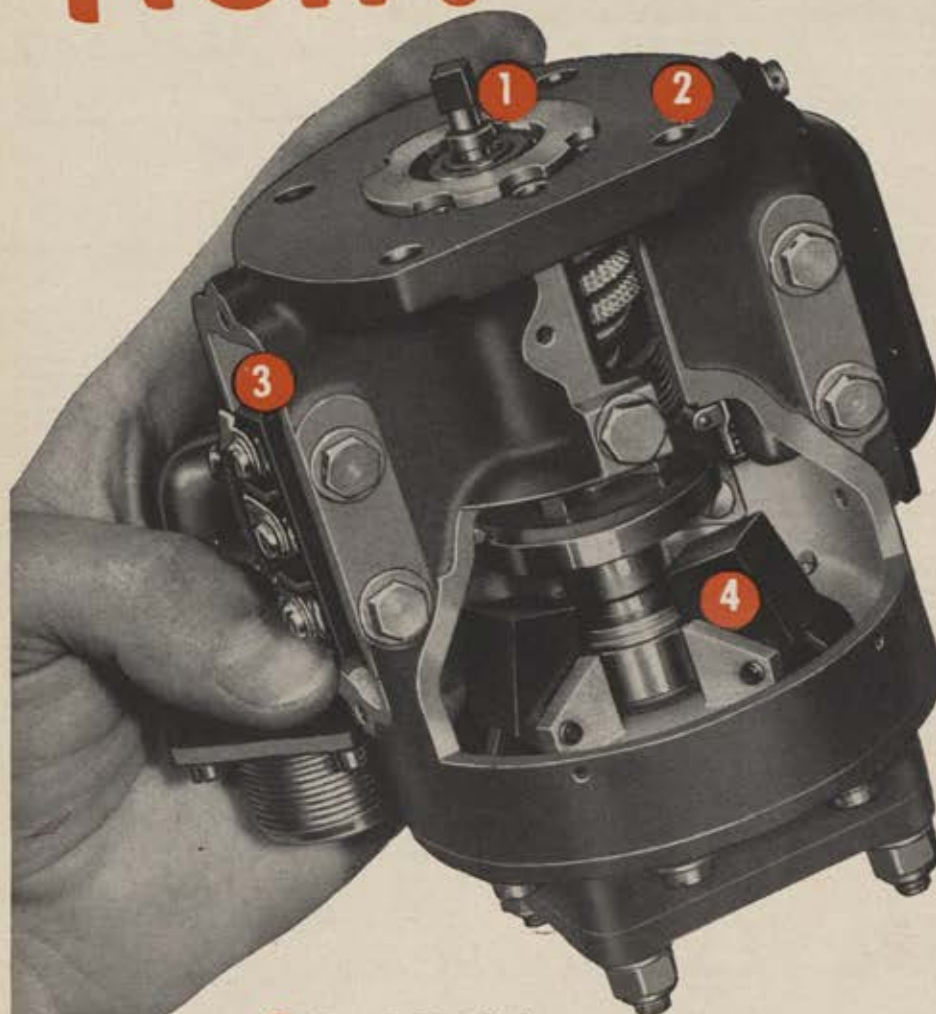
Michigan, in Benton Harbor, on June 9.

Further details and other listings will be announced as they become available.

The first two issues of the new "AFA Reports" have been mailed to units, and so far the response is good. The "Newsletter" is being mailed to all units monthly, while the "Special Material" is distributed as the need arises. The first "Special Material" was the text of a speech made by Gen. George C. Kenney to the Washington, D. C., Ad Club. If you haven't seen the new "AFA Reports," ask your unit commander or Auxiliary President, who receive them each month.

The night before AFA's latest Board Meeting, in Washington, D.C., (Continued on page 115)

New! AC speed sensing control



...for jet engines



...for turboprop engines

- accurate within $\frac{1}{2}$ of 1% of operating speed settings
- no attention required between engine overhauls
- exceeds all requirements of Mil-E-5009A

- 1 Through Drive Shaft
- 2 Standard AN Drive Pads at both ends
- 3 Snap-Action Switches
- 4 Precision Flyweight Assembly

The most sensitive control of its kind yet produced for use on gas turbine engines!

Now, you can automatically control ignition at set engine speeds . . . control fuel flow . . . operate hydraulic bleeder valves . . . actuate afterburners . . . or any of a dozen other operations important to the functioning of a gas turbine engine.

But, the amazing part is this: *This new AC Speed Sensing Control is so carefully engineered, and so precisely built, that it will "repeat" within a tolerance of less than $\frac{1}{2}$ of 1%.*

What's more, this small-size, lightweight control will operate switches at as many as four different predetermined speeds. It is designed to withstand high engine vibration, is ignition-proof, will hold calibration and operate without attention for periods exceeding engine overhauls.

AC can design a Speed Sensing Control to fit the specific requirements of any aircraft or industrial application in the gas turbine field. If you have a speed sensing problem, write direct to AC in Milwaukee. Your inquiry will receive a prompt reply.



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on December 17, President Gill Robb Wilson was in Dayton, Ohio, where he addressed a large group assembled by the Chamber of Commerce in commemoration of the fifty-second anniversary of the Wright Brothers' first flight.

Mr. Wilson outlined his idea of the shape of future aircraft, discussing boundary layer control and the convertiplane. He declared that the noise problem will be partially solved by better public understanding of its causes and need. He referred to jet noise as "the new sound of freedom," as distinct from the "noise of guns in our battle for independence."

Mr. Wilson also examined a fu-



Los Angeles AFA Group Commander Bill Barcoff gives AFA membership scroll to Milton Sperling, producer of "The Court-Martial of Billy Mitchell."

turistic model aircraft designed and built by seventeen-year-old Kenneth Gehrke. Young Gehrke won first prize in a locally sponsored contest to find the best model for tomorrow's aircraft. Later Kenneth went to Washington for an interview with Gen. Nathan F. Twining, and attended the Wright Day Dinner on December 17 as a guest of AFA Director Dr. Jerome H. Meyer of Dayton.

Before the Dayton meeting, President Wilson met a press conference that had been arranged by Jack Jenefsky, Commander of the Wright Memorial AFA Squadron in Dayton.

Three AFA Squadrons celebrate birthdays this month. They were chartered on the dates indicated. Happy birthday to these units:

Detroit Number One, Feb. 20, 1948.

San Diego, Feb. 12, 1952.

Denver Metropolitan, Feb. 16, 1953.

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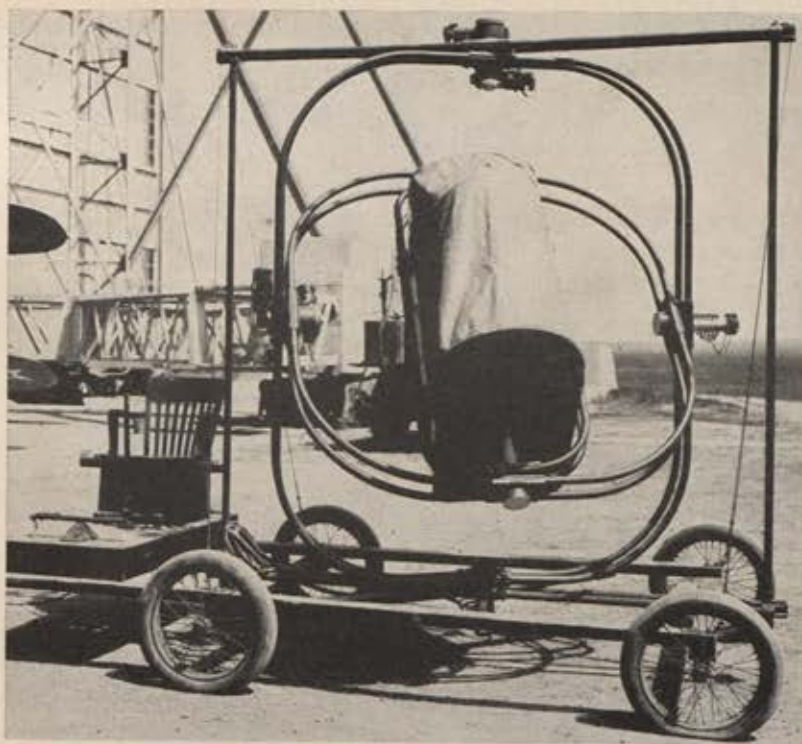


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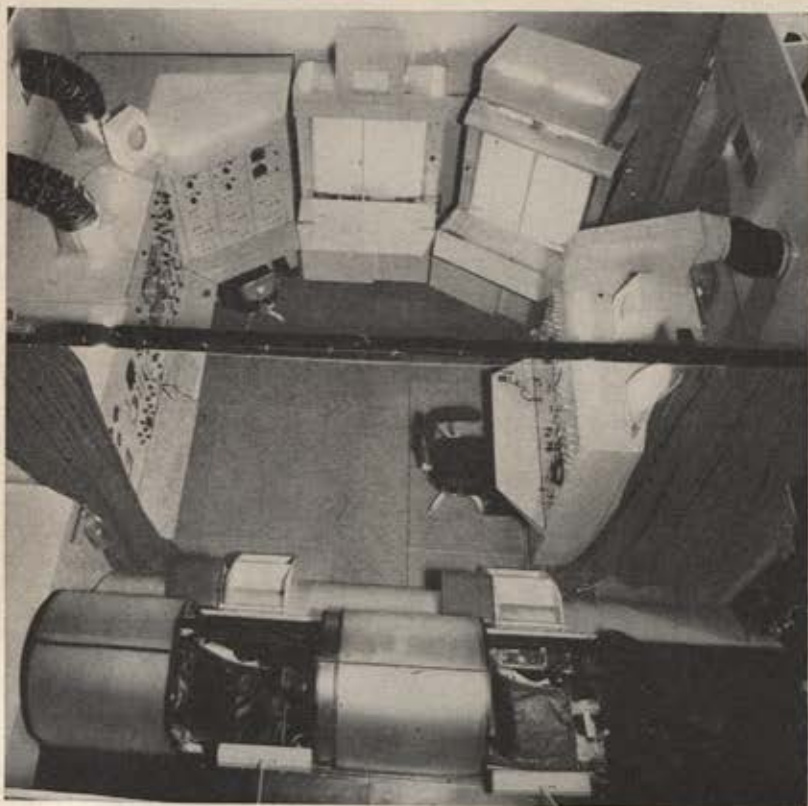
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Then and now. At top, world's first synthetic trainer, the Ruggles Orientator, brought out of storage and put in use through Ocker's efforts. Like the earliest Link trainers, the Orientator was used for entertainment as much as for testing reaction time of prospective pilots. Below, an over-all view of Link's new flight simulator for the Northrop F-89D.

AT Davis-Monthan Air Force Base near Tucson, Ariz., in January of last year, the Air Force took time out to correct a long-standing oversight.

Brig. Gen. Nils Ohman, then commander of the 36th Air Division, presented a medal to Mrs. Doris Ocker—the Legion of Merit awarded posthumously to her husband, Col. William C. Ocker, who had died more than twelve years before. The tribute was to his battle and victory, not exactly over an enemy but over a state of mind, which in his case was pretty much the same thing. To be specific, Colonel Ocker was the father of instrument flying.

The present generation of airmen was weaned on instruments, would hardly know how to fly without them. But there was a time when pilots would no more use instruments to fly than a cavalryman would use a ladder to mount his horse. More than any one man, Bill Ocker bridged the gap between past and present, the gap between fair-weather and all-weather flying.

Cockpit simulators are the latest thing, complicated replicas built to train men on the ground before they take to the air. Little ones for fighter pilots, big ones for multi-engine crews. Cost a lot of money, up to \$800,000 or more, but they save a lot of time and trouble.

Bill Ocker built the first cockpit simulator. It didn't cost a dime and



ABOUT THE AUTHOR

Ben Pearce, 56, has been free-lancing some 30 years, with bylines in The Saturday Evening Post, Coronet, and other magazines and newspapers. Now living in Washington, D.C., he was a WW II contributor to this magazine and an Air Transport Command major.

HEAD IN THE CLOUDS

By Ben Pearce

took only a couple of hours to make. It was a small, black, wooden box you could hold on your lap, about a foot wide, two feet high, and two feet deep. At one end was a padded hole to look through, at the other a wobble pump to furnish compressed air for the turn indicator mounted inside beneath a hand flashlight.

Combined with a revolving chair, this simple gadget simulated on the ground flight in clouds or fog, proved no man could fly through either without instruments. It became the most controversial piece of machinery in the old Air Corps.

Ocker hardly looked the fearless flyer part with his bowlegs, thinning hair, and gold-rimmed bi-focals suspended on a rather generous nose. He was just one of thousands of farm boys who volunteered during the Spanish-American War, had enough adventures chasing insurgents in the Philippines to like the Army and reenlist. In 1908, he happened to be assigned to Fort Myer, Va., guarding the shed housing a strange contraption two brothers named Wright claimed would fly.

When it did and the Army eventually bought it, Ocker's Pennsylvania Dutch shrewdness told him there ought to be a future in the flying business. He chose the Signal Corps when he reenlisted three years later, and went to see his company commander about an assignment to the Aviation Section. The captain was agreeable.

"I've been thinking of transferring myself," the captain said. His name was William Mitchell.

Within a few weeks, Ocker was apprentice bamboo polisher and grease-monkey in the Army Detachment at the Curtiss Flying School on North Island, near San Diego. Enlisted men were ineligible for flight training then, but he found a way. After hours, he polished bamboo at the civilian hangar across the field, keeping an itemized account of his time but not presenting a bill for several months. When he finally asked for his money, the school didn't have enough cash on hand to pay him off.

"Never mind the money," Ocker said magnanimously. "I'll take my pay in flying time."

It took him seven months to get in eight or nine hours in the air; beginners were permitted to fly only in a dead calm. But in April 1914, he was licensed to fly by the Aero Club of America. Two years later, although still a sergeant, he had qualified as a military pilot and was instructing a class of twenty-four officers, including a Lt. George H. Brett.

At the outbreak of World War I, Ocker was commissioned a captain in the Reserve, and he taught flying in Texas. While on that assignment, he also made test flights with a gyroscopic stabilizer the late Lawrence Sperry was trying to develop. The stabilizer was not successful then, but when Sperry brought out his first turn

indicators based on the gyroscope principle in 1918, he sent one to his old friend, Bill Ocker, for tests.

On one flight, Ocker flew from Washington, D. C., to New Philadelphia, Ohio, with Maj. Gen. William Kenley, then Chief of the Air Service, encountering considerable fog over the Alleghenies. He found the turn indicator helped in cross-country navigation because it registered course deviations too slight to be indicated by the compass. But it was not until two years later, when he was on duty in Washington as a flying aide to his old company commander, then Brig. Gen. "Billy" Mitchell, that he discovered its real value. In chauffeuring VIPs to and from Bolling Field, he frequently had to hazard unfavorable weather. One day on a return flight, he flew into a cloud that was bigger than he thought.

All went well for a few minutes, but then came a succession of bumps and soon he felt the plane turning—to the right, he thought. He brought up his right wing, but that only made things worse. Soon his engine was racing, and the compass whirling like a top. He had to do something quickly or he would be in a spin. He thought of the turn indicator, which he had clamped to a strut beside the cockpit. The needle was pointing left.

This time he brought up his left wing. The plane leveled off and the motor slowed down to normal. When the compass stopped spinning, he made a shallow 180-degree turn, watching the turn indicator like a hawk. Ten minutes later, he was back in the clear again.

Thenceforth, the turn indicator became an indispensable part of Bill Ocker's luggage, packed before his toothbrush and razor. He flew into clouds deliberately, gaining more confidence with each new venture in and out of the white mists that he once would have given a wide berth. But when he tried to sell other pilots on the new device, they shook their heads.

"Just another gadget to watch!"

"You must be slipping, Ocker, when you rely on instruments."

"Had too much swivel chair time in Washington, Bill?"

Ocker ignored the smiles that greeted him as he trudged down the flight line, took his gadget from his brief case and clamped it on a strut before he climbed into the cockpit. It was the "seat-of-the-pants" era; pilots were supposed to fly by instinct, like birds. Artificial aids were considered sissy, might even indicate you didn't have all your physical buttons.

One pilot who came out of a cloud
(Continued on following page)



Young Bill Ocker — apprentice bamboo polisher.



By 1916, Ocker, still a sergeant, had qualified as a military pilot. Instrument flying was still years away.



Ocker was commissioned a captain when WW I began.

upside down, but with enough altitude to regain control and live, admitted years later he never reported it because he was afraid he'd be kicked out on his next physical.

During one of those routine physicals in 1926, Ocker made his discovery. Although he had been flying for twelve years, he had never been given the vertigo test in the Barany chair. (If you've never taken it, you can easily, in a swivel chair in your office.) You are blindfolded and seated in the chair, which is then revolved to, say, the right. When the chair is slowed down slightly, you feel it has stopped. But when it is finally stopped, you feel as if you are turning in the opposite direction—to the left.

Like all the others, Ocker gave the "wrong" answers during the test. Although the flight surgeons explained that the "wrong" sensation was due to the fluid in the inner ear, and hence was actually a normal reaction, Ocker thought it might somehow serve as a bar to flying, and got permission to take the same test the next day. That evening, he scurried around and built with scraps of old lumber the little black box that was to become inseparably associated with his name.

Seated in the revolving chair again next day, he gave the correct answers every time, no matter in which direction he was turned. With his eyes pressed to the opening at one end of the box, he disregarded his senses altogether and watched the needle of the turn indicator inside. Suddenly he realized that the eyes, not the inner ear or the kinesthetic sense, are the key to orientation. When sight of the horizon or some fixed object is cut off by clouds—or a blindfold—a man simply can't tell right from left for more than a few moments. His only recourse is to believe the little white needle of the turn indicator, which can.

The doctrine that a mechanical device was more reliable than the human



In early 1930's, Ocker, then a major, with his "black box" inside a hooded cockpit. In front cockpit is Col. (then 1st Lt.) Carl Crane, his collaborator.



Colonel Ocker checks out in one of his own training devices—the Ocker Training Buggy, which was used in preflight to test the reflexes of flyers.

senses proved highly unpopular. It exploded the fond belief that flyers were a kind of ethereal elite. Ocker's recommendation that all Air Corps pilots be trained in instrument flying was turned down by Washington, but he began to make a few converts at the cockpit level. At Crissy Field in California, he designed a hood that could be fitted over one cockpit of a dual control plane, so that a pilot could practice flying by instruments

while a co-pilot sat by in case the ship got out of control.

One of his converts was Sir Charles Kingsford-Smith, who later said he never could have completed his flight from California to Australia without the training he got in Ocker's hooded cockpit. Instructors at the nearby Hancock Foundation College of Aeronautics took up the system in 1929 and made it part of the regular curriculum.

(Continued on page 121)

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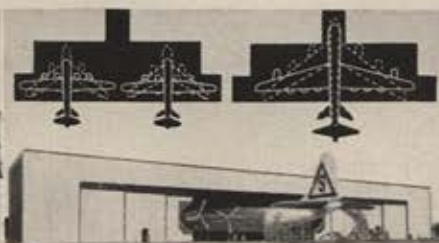
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the first such course in a civilian school.

Transferred that same year to Brooks Field at San Antonio, Tex., one of the Air Corps primary flying schools, Ocker continued to spread his heresy. Pilots of the Mexican Division of Pan American Airways at Brownsville took one ride in the revolving chair with Ocker's black box on their knees and hit the instrument trail. Pan Am, one of the first airlines to require all pilots to check out in the hooded cockpit, cut cancellations due to weather on the Brownsville-Mexico City run from about forty-five to less than one percent.

At Brooks Field itself, a group of instructors adopted the new faith and soon were flying triangular courses under the hood all over the south Texas landscape. Apparently they had not seen a report in the files of the Air Corps Training Center headquarters at nearby Duncan Field, which concluded:

"Blind flying is not necessary under normal conditions, and is extremely dangerous under abnormal conditions with the instruments we now have. It is strongly recommended that blind flying be not included in any phase of training at the Air Corps Training Center."

When word of these successful instrument flights, made with "the instruments we now have," reached Brig. Gen. Frank P. Lahm, then in command of the ACTC, he issued an order in June 1930 for all students at the Advanced Flying School at Kelly Field to receive ten hours' instruction in instrument flying, preceded by the black box and turning-chair routine to convince them they couldn't fly blind without it. The new course was described as "tentative," but the order was never revoked.

It was many years, of course, before all Air Corps pilots were trained in instrument flying, but the battle for official sanction was over. Ocker had stepped on a few toes during the course of it, and was twice ordered before medical boards for sanity tests. Both times he was officially pronounced sane.

"I'm twice as sane as anybody in the Air Corps," he used to say in that quiet drawl of his, "and I've got documents to prove it."

Another byproduct of his crusade was a general court martial. After a minor crackup, he was grounded for eye deficiencies, although he wore corrective goggles, as many of the older pilots were permitted to do in those days. In his agitation over this turn



A cutaway view of the Ocker box. A hand pump is attached to the chair.



An Ocker device used in blind flying instruction at Randolph Field, Tex.

of events, he made some uncomplimentary remarks about the superior officer he believed responsible. When the grim visaged tribunal convened at Fort Sam Houston—not one flyer sat on the court—an artillery colonel remarked privately, "Ocker has been around long enough to know even the truth is no defense against calling your boss names." Chances of acquittal were quoted unofficially at twenty-to-one.

But Ocker had made many friends, too, on his crusade. "Except for Major Ocker's great zeal as a missionary," Orville Wright said in a deposition, "I doubt whether the course in blind flying would be a requirement in the Army today. I believe his campaign of education has had more influence in bringing about the use of instruments

than that of any other person." Until he had a demonstration of the Ocker box, he declared, he himself had been unaware of the turning illusion.

Eddie Rickenbacker, Jimmy Doolittle, and many other noted flyers joined in the chorus. Gen. Billy Mitchell called his work "second to none in our service." A captain named John K. Cannon took the witness stand in his behalf. There was still the matter of the derogatory remarks, but the law member of the court took care of that. Noting that they were originally made to a flight surgeon during the course of an official physical examination, he asked in effect:

"Did the defendant consider that the remarks in question were made in the confidential doctor-patient relationship, that it might even be his duty to confess to his flight surgeon a disturbed mental attitude which might interfere with his flying activities?"

The answer to that one naturally was "yes." The court took twelve minutes to vote an acquittal. Ocker picked up his corrective goggles and went back on flying status.

But not all the side effects were unpleasant. The National Advisory Committee for Aeronautics chose Ocker's black box from more than 4,000 designs submitted as the invention contributing most to the development of aviation, and awarded him a \$1,000 prize. The War Department patented in his name the hood device for instrument flight training and eventually the training method itself—just as a precaution against future infringement suits. He collaborated on a book on blind flying with one of the young instructors who had taken up the cause when he first transferred to Brooks Field, Col. Carl J. Crane, then a first lieutenant and now retired. He and Colonel Crane worked together on a preflight reflex trainer, a "simulator" it would be called today. It was a cockpit mounted on three wheels that facilitated machinegun practice on the ground, and was used extensively in the pilot training build-up for World War II.

Colonel Ocker was air officer of the Third Corps Area when he died in Walter Reed Hospital in Washington in September 1942. He never got a chance to practice the flight techniques in combat he had preached so long and effectively. But thousands of airmen who came after him wrote a glorious history in the fogs and mist of the ETO, the Aleutians, and the South Pacific. Thousands of them won

(Continued on following page)

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American Cancer Society 

OCKER.....CONTINUED

medals for their skill and heroism. And when it came to the attention of an old friend that Ocker had never received one, he sat down and wrote this recommendation for the posthumous award of the Legion of Merit—to correct a long-standing oversight, so to speak:

"Col. William C. Ocker distinguished himself by meritorious achievement in the performance of outstanding service to the United States from September 8, 1939, through June 30, 1942. An early exponent of the 'theory, concept and applicability of blind flight,' Colonel Ocker realized the necessity for establishing an objective course of training for all rated personnel in the principles of instrument flying.

"As a result of his own tireless and extensive experimentations, Colonel Ocker demonstrated extraordinary foresight and personally pioneered the design and formative development of a preflight reflex trainer, which ultimately became an indispensable factor in the pilot training program.

"Through his firm conviction that this training would improve the effectiveness of flying personnel and his forcefulness in advocating its adoption, Colonel Ocker made a significant contribution to the military effort of the US during World War II.

"Largely because of Colonel Ocker's foresight the vital requirement for an acceleration of the pilot training program was successfully met. The ingenuity, perseverance and technical ability displayed by Colonel Ocker contributed immeasurably to the development and advancement of aviation.

"His selfless devotion to duty, throughout a long and distinguished career of service to his country, has reflected the highest credit upon himself and the US Air Force."

The authors of citations accompanying medal awards, of course, are anonymous. But if the author of Ocker's were not, it would read: By Nathan F. Twining.—END

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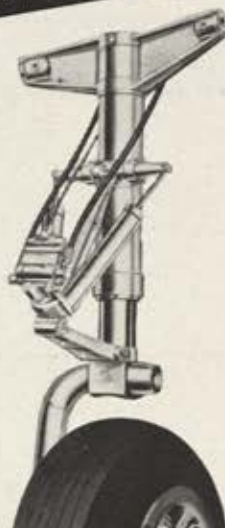
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