AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

WHAT GIVES WITH THE RESERVE?
An Up-to-Date Report on What Is, and Isn't, Being Done

APRIL 1954 • THIRTY-FIVE CENTS

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In ever-increasing numbers, Boeing B-47 Stratojets are flying the skies over America, and the Atlantic and North Africa as well. More than 600 of these fighter-fast, six-jet bombers have been produced by Boeing's Wichita Division. Deliveries to the Air Force are on schedule—and have been each month for more than two years.

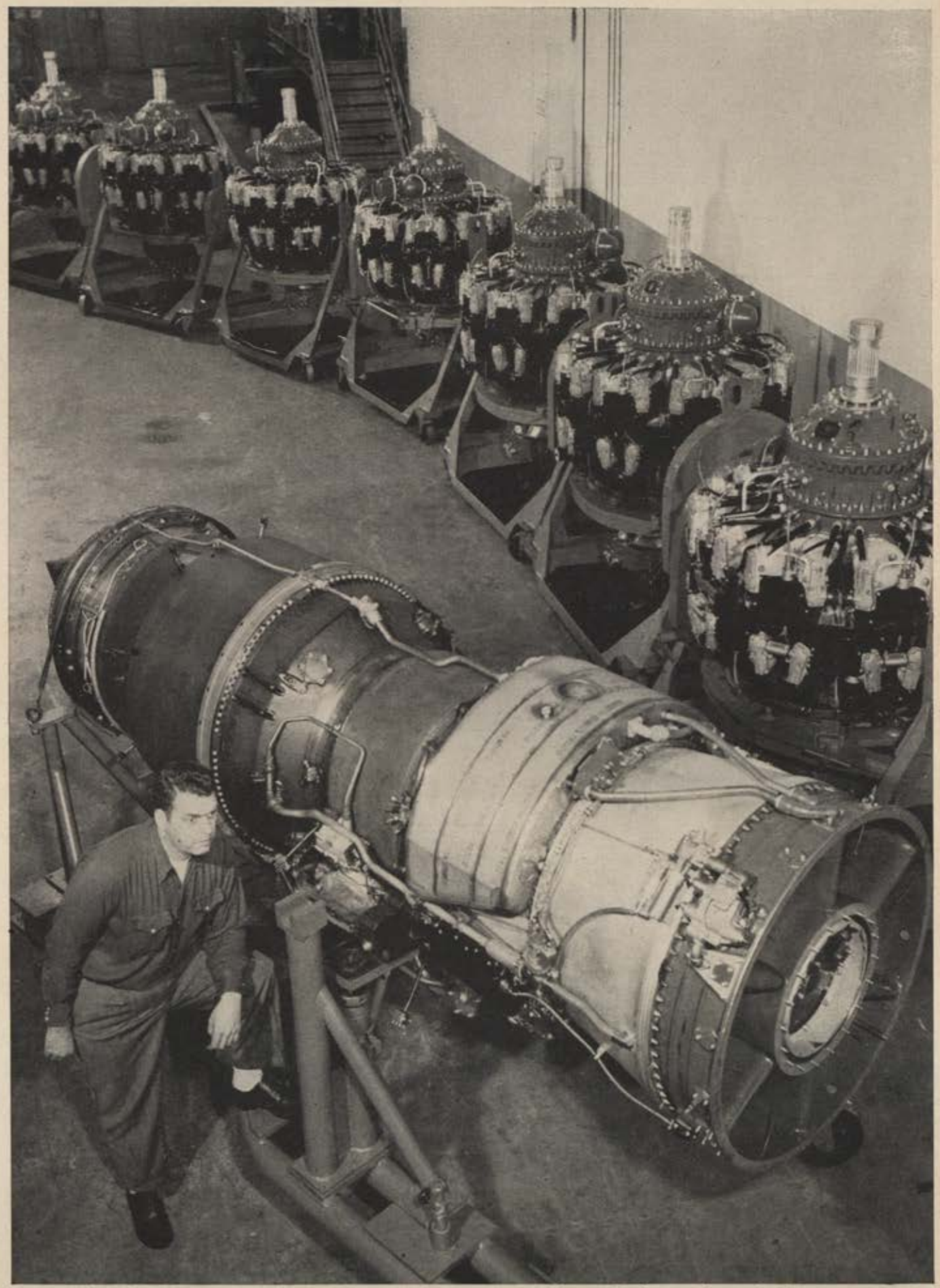
In addition to meeting delivery schedules and constantly improving designs, Boeing also continually works to reduce costs. Today the company produces the advanced-design B-47 with fewer man-hours per pound than were required for the much less complex B-29s during World War II. Cost of the B-47 has been reduced to a point well under the original price—with substantial savings to the government.

Efficient production has also made possible on-schedule deliveries of Boeing KC-97s every month for the past three years. These huge tanker-transports, one of the most versatile aircraft now in service, are being manufactured at costs considerably below the best previous estimates.

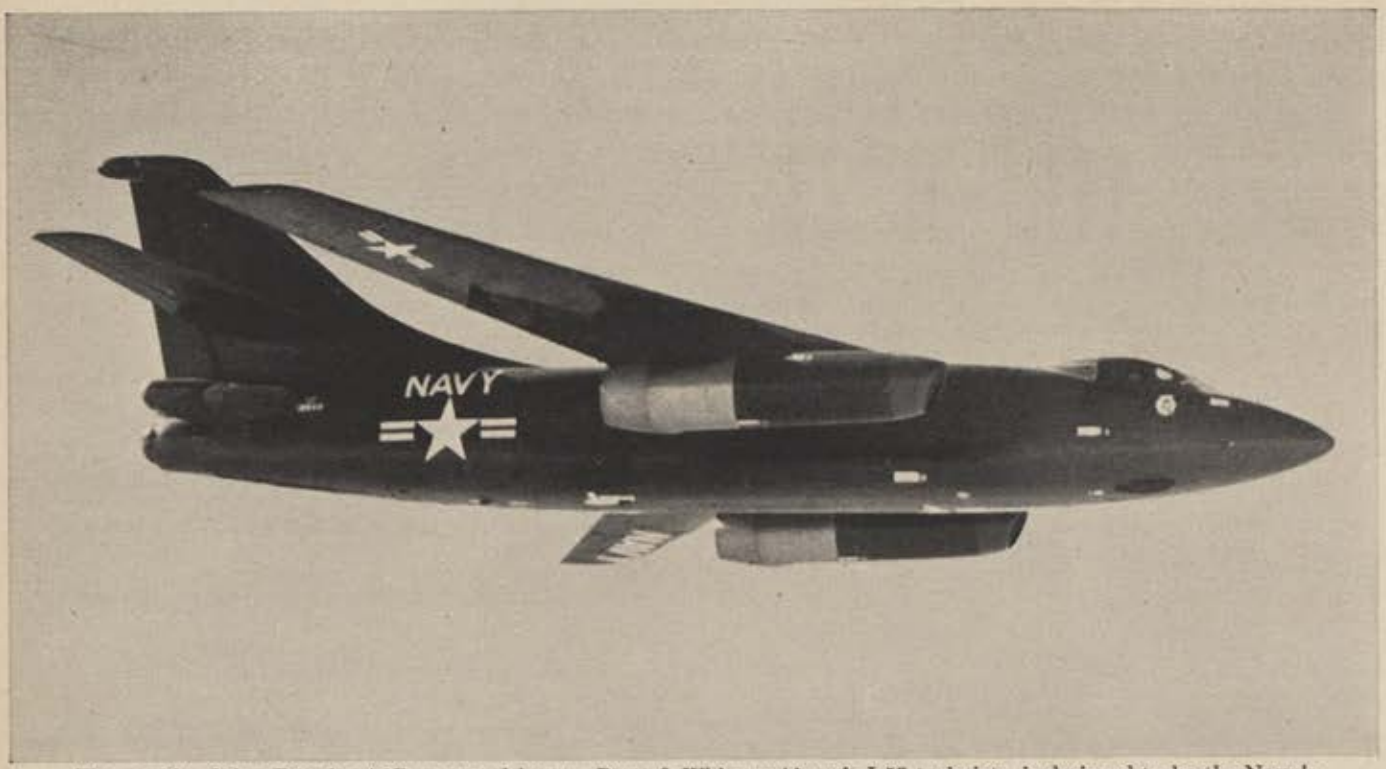
To operate at higher and higher levels of efficiency, Boeing maintains continuous training programs for workers and management alike. Cost-cutting suggestions are solicited and rewarded.

The growing list of records established by Boeing airplanes documents the integrity of Boeing design and research, just as on-schedule deliveries and constantly reducing costs underline the efficiency of Boeing production methods.

BOEING



Pratt & Whitney Aircraft's compact J-57, pictured here, can exceed the combined power of seven 2400-horsepower R-2800 piston engines. It requires twice as many production tools to build as does the 18-cylinder R-2800 type.



The new far-flying Douglas A3D, powered by two Pratt & Whitney Aircraft J-57 turbojets, is designed to be the Navy's most potent carrier-based aircraft—a major addition to U. S. Air Power. It is in the 600-to-700 mile-per-hour class.

More Power Behind the Navy's Sunday Punch

As a product of creative aircraft engineering, the Navy's big Douglas A3D attack bomber ranks high, for no other known airplane of comparable size can carry an equivalent bomb load as high or as fast. And yet it is designed to operate from the decks of far-ranging Navy aircraft carriers.

A major reason for the A3D's outstanding performance is the complete integration of airframe and power plants. From its sleek nacelles to interior ducting, this outstanding new jet bomber is designed to take full advantage of the enormous power developed by its two Pratt & Whitney Aircraft J-57 turbojet engines.

Without afterburners, the 10,000-pound thrust class J-57s can easily push the big attack plane to fighter speeds and to operating altitudes in excess of 40,000 feet. Outstanding fuel economy of the J-57 engines gives the Douglas A3D the important advantage of increased range.

Before long, increasing numbers of these potent carrier-based aircraft will be rolling from assembly lines. With other J-57-powered bombers and supersonic fighters—a whole new generation of Navy and Air Force aircraft—they will become a vital part of American Air Power, giving this nation the air strength to deter possible enemies from attack, or to meet the emergency of war if it should come.

Pratt & Whitney Aircraft's J-57 turbojet engine is indeed fully justifying the long years and intensive effort required for its development and production.

Pratt & Whitney Aircraft

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AIR MAIL

Non-Com Efficiency

Gentlemen: During the last year or so, I have read various articles about the faults of the USAF program concerning non-coms and the career men in general. While it is common knowledge there is a great need for improving current policies for non-coms and career men, my question is, "Is there anything being done to improve these policies?"

I myself am a career man and have just reenlisted for six years. Therefore, I am very much interested in the Air Force policies regarding non-coms and career men.

However, letters like the one published in your October issue ["Air Mail"] from a staff sergeant of Mitchel AFB, N. Y., will never be of any help for the career man or the non-com of the Air Force. In his letter he states: "I myself am a four-striper, and though I earned them through proficiency in my specialty, I don't kid myself for a moment; as a leader I've got a long way to go. Pay me for my proficiency. I worked hard for it, but for the love of pete look to a leader for leadership."

I've been under the impression that an airman should possess certain qualities of leadership before being promoted into the non-com bracket. However, this does not seem like the case of the staff sergeant mentioned above. Yes, gentlemen, I agree the Air Force does need to improve their NCO policies. This I know from experience. But I also know there are a lot of NCOs who need improving, too.

Frankly, I don't see how we can expect any more privileges until such a time as the men like the one mentioned above are separated from the NCO ranks. I don't doubt that the staff sergeant from Mitchel does his share of the work, but that is not enough. He should possess the qualities of a leader as well as the high proficiency in his specialty. Otherwise, there would be no distinction between the lower four grades and the top three grades.

M/Sgt. Max E. Poole
Robins AFB, Ga.

Observer a Hero, Too

Gentlemen: As a long-time radar observer in both F-94Bs and B-29As with more than a hundred hours of combat time, I should like to add a few facts to the Jet Blast "Ignored Observer" in your February issue.

When Bob Cunningham and his observer, 2d Lt. Jack E. Brindley, of Buffalo, N. Y., scrambled after the bogey, a group of us were waiting for our turn to lurch off into the black at our Korean alert shack. Ordinarily, we timed each mission and could determine approximately when an aircraft would return. The usual amount of time went by with no results. Further search that night yielded no real clues concerning the whereabouts of the pilot-observer team.

The story, as I got it over the weeks following, was that radar contact had been made with a low-flying job somewhere in North Korea. As radar observer, Jack Brindley directed his pilot in to the kill only to disappear from the Ground Controlled Intercept station radar screen as two blips were seen to merge on the scope.

About Bob Cunningham—he was a rated pilot, a radar observer (all-weather fighter) and a rated bombardier. Quite a list of accomplishments for an old throttle jockey. He also flew thirty-one missions in F-82 Twin Mustangs in Korea, and during his tour in Panama flew as a radar observer in the old Northrop P-61 Black Widow.

Stanley J. Grogan, Jr.
Washington, D. C.

Suggestions

Gentlemen: I subscribed to AIR FORCE Magazine to help me in model plane building and spotting, so if you like a little suggestion, more pictures of aircrafts would be appreciated. Thanks.

Jean Louis des Jardins
Matane, Quebec, Canada

Gentlemen: Keep up the very good work. AIR FORCE today accurately reflects the policies and future of the USAF.

I would still like to see a good article, not a defense or apology, for the multi-engine (conventional) boys—especially troop carriers.

Lt. Charles R. Richards
Charleston, S. C.

The M/Sgt Again

Gentlemen: Three cheers for M/Sgt. Winfield and his "Cause of the Pause" article. I agree and then some.

In my case, I was a technical sergeant in a Reserve wing recalled to EAD for twenty-one months in April '51. I had to leave a good civilian job, luckily, on military leave. As a college graduate with a good start on a master's degree I welcomed chance to do a job. The AF sent me to Lowry AFB to Finance School. Upon returning to my base I worked in the same finance office the remainder of my twenty-one-month tour. No promotion, not even an up in my AFSC. I came in as an 81150 and left the same way. I submitted papers for a commission, but they were returned with the comment "Not enough experience." What about the ROTC boys? Anyway, after twenty-one months I returned to my civilian job doing marketing research for the telephone company.

I would have stayed in the AF as a first lieutenant. I would have considered staying as a master sergeant. No dice! The majority of the airmen of that Reserve wing were college men, many with prior service. Very few stayed in.

In closing, I might say that I am back with a Reserve wing again and getting nothing. Why am I doing it? Because I feel that thirteen years' service, both active and Reserve, are too much to throw away. I keep hoping things will change, and deep down the USAF is in my blood.

Tom Gregory
Los Angeles, Calif.

Gentlemen: I just got my first copy of AIR FORCE Magazine from our local base PX. It sure was good to see a magazine about the Air Force, but reading it I found many things about which to gripe.

First off, it so happens I like the Air Force and what it stands for and am proud to be part of it. I left college after three years to enlist because I wanted to get into the Air Force, not from fear of being drafted. Having been in for a few years now I like it more and more

(Continued on page 7)

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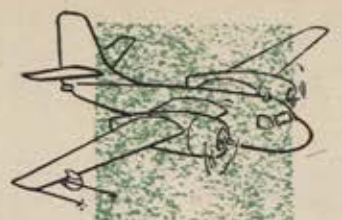
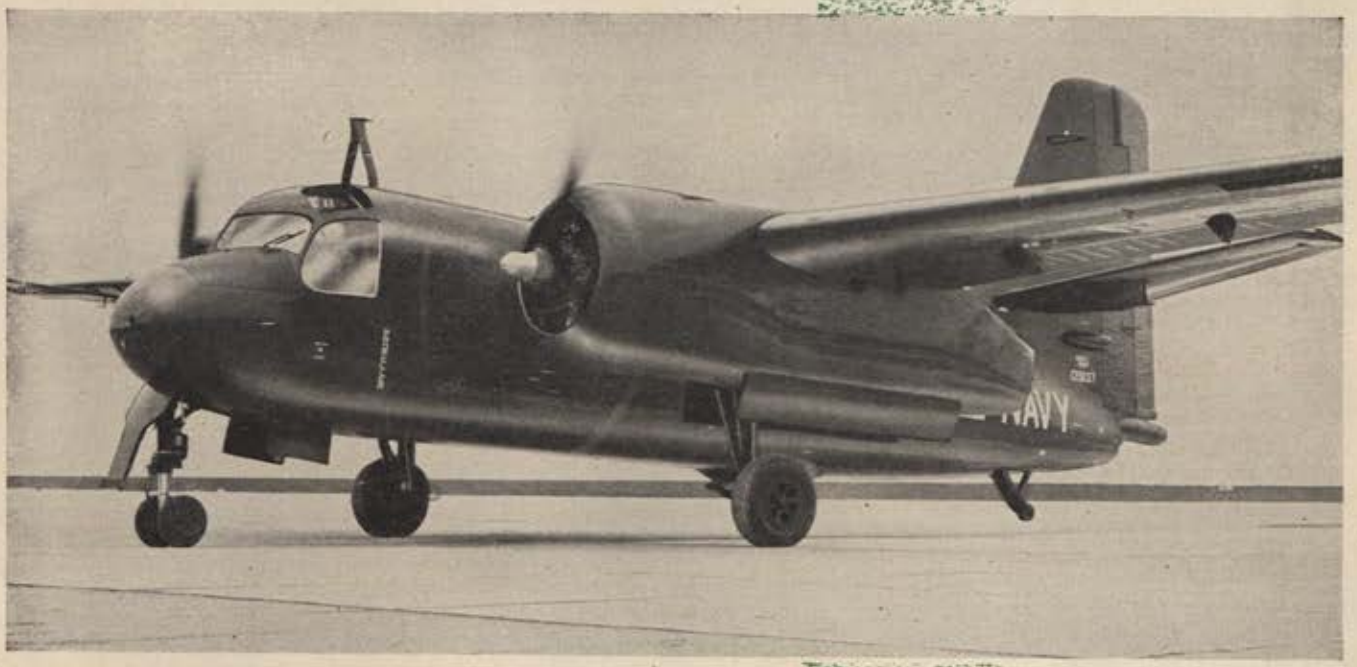


Marquette WINDSHIELD WIPERS



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each day. What I don't like is the laughs one gets when he mentions reenlisting. It seems to be quite a big joke and I wondered why. I found one of the reasons in M/Sgt. Norman Winfield's articles. It seems he gives all the credit to the NCOs and forgets that we, the lower three grades, are a part of this Air Force, too.

I have yet to see a base in the Air Force where the top three didn't "have it made." They can come and go as they please because *we* are always there on the job. These men are nothing to be proud of and I, for one, am real glad to see them get out. Their value is nil. The Air Force is all new right now and we new men have been trained to cope with the new problems and machinery, but the old boys haven't and are beginning to realize it more and more each day. This is why they are getting out! As Sergeant Winfield said in his article, "The airmen have brains" and that's why we're getting out because we can see right through these inefficient "leaders" and want nothing to do with them or their Air Force. I want to stay in but refuse to have to be held down by a "stupe" who won't let us advance the Air Force and show him up. The Air Force needs new men, and without the influence of these "old dogs." I say if we can get rid of them and get a new, more intelligent crew in, we will have more new men staying in.

The Air Force is the best there is, and I really want to stay in but feel that these old guys don't want us. They want a "corps of their own." How can we ever work together at that rate?

Airman

No Dodgers Here

Gentlemen: I am a recent subscriber to your magazine and find your "Air Mail" section to be one of the finest sounding off platforms of any magazine on the market. Therefore, I would like to sound off a bit myself, with a partial answer to the letter from M/Sgt. Stanley Phillips in your February issue.

The letter from the sergeant was very well written and a credit to him. But to call ROTC graduates (seemingly collectively) draft dodgers makes me "dadburned tired." When I entered the University of Connecticut in September, 1950, the Korean war was still a so-called incident. Everyone thought it would soon be over. We were basic ROTC students at the time and were, for the most part, below draft age. We were not draft dodging. As the fighting progressed we were told there would be a need for officers and that ROTC was the largest officer-producing unit in the country. So we stayed with it. I do not intend to slam the officer who gets there the hard way. But history has proven the officer with more education is for the most part the fittest.

I am now a senior in AF-ROTC and proud of it. I may not get a commission in June because I am not qualified for flight. This is not a fault of my own but rather of "the powers that be," at least in my book. However, with my fine lesson plans, good instructors and time spent in the program, I feel I shall be qualified to be an officer. And I, too, would like to be a career man. Many of my friends in the program feel the same way. So you see, sergeant, we're not all draft dodgers.

John W. Krisak
Meriden, Conn.

Congressman Interested

Gentlemen: I read with considerable interest an article in the January 1954 issue of your excellent magazine entitled "The Rigid Airship" by Edwin J. Kirschner.

I feel that this is a matter which warrants further study and was glad to see this article published.

William H. Ayres, MC
House of Representatives
Washington, D. C.

LTA Ships

Gentlemen: In regard to E. J. Kirschner's "Jet Blast" (January issue) and Lt. Col. Preston L. Hill's comments (February issue), may I add my comments?

I have been an LTA pilot since 1928 and am presently employed in that capacity. I am also qualified in rigid airships, having completed the Navy course at Lakehurst and on the *Macon*.

I made several flights on the *Graf Zeppelin* and *Hindenburg* and can vouch for the comfort of this mode of travel. Airsickness is unknown; noise is practically non-existent. The piano recitals given by Capt. Lehman in the main lounge were not marred by any motor noises. Whistles on ships at sea and on factories and buildings on shore are easily heard as the ship flies over. A fountain pen placed on end on a table in the cocktail lounge would still be standing there when the owner had finished his cocktails. The cost for fuel oil for each crossing was only slightly over $300. Talk about economical!

We are the only country with known ample supplies of helium, a lot of which is going to waste.

The Navy still has quite a few qualified rigid airship authorities. I remember back in the thirties that I ran into a lot of excellent Army lighter-than-air personnel at Langley Field, Scott Field and Fort Bragg. Some of this excellent talent must still be available.

It seems a terrible tragedy for our country to neglect completely a wonderful means of transportation in which we have a natural monopoly.

Larry P. Furcolow
Miami, Fla.

O'Hare Hassle

Gentlemen: Your photograph on page 65 of the February isue, accompanying the article "Our Earth-Bound Air Age," is identified as "Chicago's O'Hare."

This photograph is one taken back about July 1933 of the old Chicago Municipal Airport (now Chicago Midway) when it was only one-quarter of its present size. The grandstands at the left side of the picture were used for the American Air Races in 1933.

The Illinois Air National Guard hangar, erected in 1939, now occupies the area in the lower left-hand section of the field as pictured in your twenty-one-year-old photo.

Lt. Col. William C. Hoffman
Illinois ANG
Chicago, Ill.

At top, Midway in '33, which we called O'Hare. Center, Midway today. Bottom, here's a bona fide shot of O'Hare Internat'l Airport.

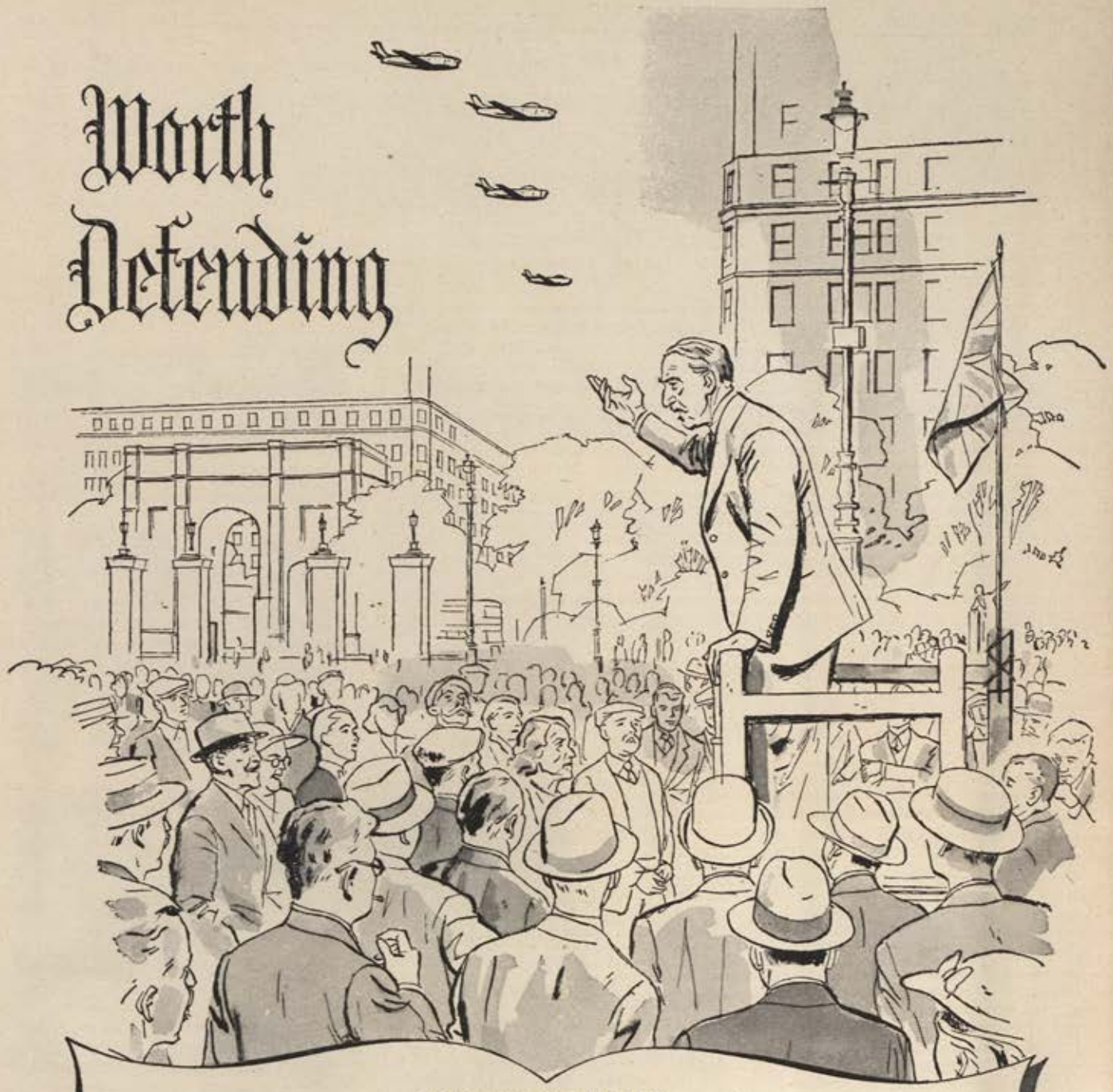
Gentlemen: This is in regard to the picture on page 65 of the February issue with the article "Our Earth-Bound Air Age." The caption states that the field shown is "Chicago's O'Hare." Having been out there a few months ago I'm sure it did not look as shown. Have they completely remodeled the place or is this some other field?

John L. Novak
Vice Commander
DuPage Sqdn., AFA
Villa Park, Ill.

• *Our apologies to Readers Hoffman and Novak and to the dozens of sharp-eyed Chicagoans who spotted the error.*

(Continued on page 10)

Worth Defending



FREEDOM OF SPEECH

"I disapprove of what you say, but I will defend to the death your right to say it!"
— VOLTAIRE

Freedom of Speech — the right to champion one's political views . . . to protest acts of government . . . to express new ideas or defend old ways . . . these become "crimes" and are hastily silenced wherever fascism or communism reigns . . . and liberty of thought and conscience is no more.

Consider the liberty which we, in the free nations, enjoy . . . to speak out against wrongs . . . to speak up for what is right! Our Freedom of Speech is the great keystone of true democracy. Our Freedom of Speech is *worth defending!*

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Shooting the Breeze

THIS is my 36th issue of AIR FORCE since I joined the staff as managing editor. And I've about decided that AFA isn't the healthiest place in the world to work. In those three years Editor Jim Straubel has been in the hospital three times—twice for surgery. I lost three weeks with a shoulder operation. Jake Culpepper, of "Airpower in the News," and our art director, Bill Dean, both parted with their gall bladders. Ralph Whitener, our program director, had a heart scare recently. Gus Duda, organization director, just returned from an appendectomy. Ethel Holly, of the accounting department, and Marcella Warner, of the membership department, are both veterans of the operating room. Jack Hewitt, of our promotion department, has alerted us for future surgery. As an office, we're the doctor's delight.

And we're not out of the woods by a long shot. Just a month ago art director Bill Dean was stricken by a cerebral hemorrhage. In fact, as of this writing he is on the critical list at Washington's Garfield Hospital. This is the first issue since I've been here that we put together without Bill's services, and I still can't get used to the idea. As substitute art director we called on Stuart Freeman, an AF veteran and freelance artist who, conveniently enough, has a studio in our building.—JOHN F. LOOSBROCK, Managing Editor.

CREDITS

Front cover—Vernon Nye (art), Stuart I. Freeman (layout); page 12—Arlo Greer; page 16 (Lindbergh)—Wide World Photos; pages 46 and 47—Don Cannavaro; page 60—Vernon Nye; page 67—Jack Tippit; page 73 (lower right)—"Tex" Glazier.

AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

Vol. 37, No. 4 • APRIL 1954

FEATURES

DEPARTMENTS

THE COVER

The civilian math teacher on our cover this month and the chap conducting the Air Force briefing are the same person—symbolic of the many activities of Uncle Sam's weekend warriors. More realistic utilization of civilian skills is just one aspect of the new, streamlined Reserve. AFA's Assistant for Reserve Affairs, Ed Hogan, has gathered a wealth of background material on the Reserve—where it is today and where it's headed. His story, "What Gives with the Reserve Program?" begins on page 31. Vernon Nye did the art work for this cover, and Stuart Freeman did the layout.

MEMBERSHIP IN AFA

AIR FORCE Magazine is mailed monthly to all members of the Air Force Association. There are several ways you can become a member. If you were in the Air Force or its predecessor services, you're eligible. The $5 yearly dues include the magazine. Or if now on active duty, you can be a Service Member. Those interested in airpower can become Associate Members for $5 per year. The cost for CAP and AF-ROTC cadets is $3 per year. Details of membership in AFA on page 92.

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AIR MAIL — CONTINUED

We merely used the caption which was on the back of the picture furnished us by the Civil Aeronautics Administration. —The Editors.

Air Transportation

Gentlemen: As a Chicagoan I cannot help but take exception in some measure to the article "Our Earth-Bound Air Age" by Wilfred Owen, which appears in the February issue of AIR FORCE.

The thesis, summed up in the last sentence of the article, that the Air Age will continue to elude us until the trip can be made all the way by air, would seem to be in part contradicted by the facts listed in paragraph 2 in the second column on page 67 where the tremendous growth of air transportation is described.

The article's thesis would also seem to have been contradicted by "Wing Tips" on page 21 where the same writer points out that "The world's airlines carried five million more people last year than they did in 1952."

Another item describes that seven out of every one hundred persons on American Airlines are first flighters.

Added to this, the fact that considering not only the tremendous developments of airlines within the United States since the war, but the fact that a United States citizen can buy a ticket on the average major trunk line which will be good on somewhere in the neighborhood of one hundred twenty international carriers from here to Timbuctu, I believe that the thesis is not exactly accurate.

The time quoted between Midway and downtown Chicago is one hour and ten minutes. I am sure that this refers to the time which a passenger must be at the downtown limousine stand before flight time. Actually the running time, if one uses private automobile (and a large portion of the passengers do), is between twenty-five and forty minutes—a time considerably shorter than is indicated.

Edmund Stohr
Chicago, Ill.

• *In a way it does seem contradictory to cite the tremendous success of air transportation and then to suggest that a new kind of air vehicle will be necessary before the real air age comes along. But the future holds even greater promise for air transport when the ground transportation obstacles now imposed are removed. And that objective, it seems to me, will have to be accomplished by a vehicle that gets us all the way by air.*

You are right about the running time —it was taken from airline schedules.— Wilfred Owen.

Word From Denmark

Gentlemen: As soon as a new issue of AIR FORCE Magazine is read by the personnel of this office, it is passed on to members of the Royal Danish Air Force. We think that the Air Force Association is doing an outstanding job of presenting the facts about airpower. Also, I appreciate the manner you use in calling attention to some of the weak spots in the USAF. Your articles aimed at strengthening the status of the non-coms will receive wide support throughout the USAF.

I hope the Air Force Association continues to keep its sights aimed toward an Air Force which will provide the maximum protection at a minimum expense for the American public.

Col. William T. Bolt, Air Attache
American Embassy
Copenhagen, Denmark

MATS

Gentlemen: We were so interested in the air rescue story, "That Others May Live," by Karl Detzer, and the cover by Vernon Nye, in the February issue of AIR FORCE Magazine, that we displayed a copy layout on the bulletin board in the rotunda at MATS Headquarters.

The photograph shows A/1C Catharine Joyce, a shift leader in Air Weather Service, and A/2C Tom Sandoz, Information Services, inspecting Mr. Nye's

February cover makes the grade

drawing in front of the bulletin board.

Although the fact that the Air Rescue Service is an element of the Military Air Transport Service was not mentioned, we of MATS are proud that ARS is a member of our global organization.

Lt. Col. Bernard Peters
Chief, Information Services
Hq., MATS
Washington, D. C.

Sorry, Bill

Gentlemen: I enjoyed reading "You Can't Set A Record By Yourself," Col. Willard Millikan's account of his record-breaking cross-country jet flight, in the February issue of AIR FORCE. But the caption for the picture on page 28 is wrong. It identifies the airman standing on the wing of Millikan's plane as M/Sgt. Cliff Evenden. Actually, the chap is T/Sgt. Bill Gregory, Millikan's crew chief. Incidentally, Gregory was a line chief with the 4th Fighter-Interceptor Wing in Korea. We think he's the best F-86 crew chief in the country and we're proud that he belongs to the D. C. Air National Guard.

Dick Baltrotsky, DCANG
Washington, D. C.

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RESEARCH • DEVELOPMENT • ENGINEERING • PRODUCTION

By Wilfred Owen

A total of 1,427 air markers were painted on roof tops and towers in the US last year, bringing the total of such markers to about 7,000. The standard marker consists of chrome yellow letters at least ten feet high on a black background. They tell the name of the town, and may give the latitude and longitude and indicate the direction to the nearest airport.

° ° °

For nineteen years American Airlines has been providing sleeper service from New York to Los Angeles. The sleepers have now been discontinued because the speedier DC-7s have cut down the bedtime.

° ° °

When forestry officials in Oregon built a lookout tower on the summit of a 3,300-foot mountain, they got a Hiller helicopter to airlift the construction material from the foot of the

mountain to a fifteen-foot square landing area on the top. The copter lifted 21,500 pounds a vertical distance of 1,600 feet at a cost of eleven cents per pound, cheaper than by any other method.

° ° °

Aircraft owned and operated by US corporations are in the air three-quarters of a million more hours per year than the total time spent aloft by the airlines.

° ° °

Every day more than 2,000 passengers arrive or depart on transatlantic flights at New York International Airport.

° ° °

The CAA warns lightplane owners against the hazards of field mice. Mice like to make their nests in interior engine cowling, fuselage, and wing spaces where they interfere

with vital engine and control functions. They also enjoy eating the fabric.

° ° °

A 450-passenger turbojet helicopter project was recently initiated by a British aircraft firm. Diameter of the rotor will be two-thirds the length of a football field.

° ° °

The US aircraft industry produced nine billion dollars worth of aircraft last year, third largest production year in history.

° ° °

The C-124 is equipped to parachute 40,000 pounds of cargo in a period of a few seconds.

° ° °

The total number of people enrolled in the volunteer Ground Observer Corps is now close to 232,000.

° ° °

A helicopter's ability to hover permits rooftop mail delivery where post office roofs are not stressed for landing. A Piasecki

H-21 demonstrated this when it hovered over Philadelphia's 30th Street post office and unloaded two feet off the roof.

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Skyrocket—set world records in '53 of 1327 mph, 83,235 feet altitude

Skystreak—world speed record 1948, 650 mph

high-speed research aircraft

—the supersonic Douglas X-3

Now to the record-breaking Skystreak, the Douglas Skyrocket and the record-holding carrier-based Skyray, add this important experimental plane—the Douglas X-3.

Performance is secret, but a little can be told. Longer, heavier than a DC-3 transport, X-3 flies on wings smaller than a DC-3's tail—using conventional jet engines for *sustained* flight. X-3 has already contributed basic facts on insulation, refrigeration, and the use of heat-resistant *titanium*, while its payload of research instruments has been used to study the stresses and strains of flight at supersonic speeds.

Design of X-3 is another example of Douglas leadership in aviation. *Faster and farther with a bigger payload* is a basic Douglas rule.

Enlist to fly with the U.S. Air Force

Depend on DOUGLAS **First in Aviation**

AIRPOWER IN THE NEWS

BY JAKE CULPEPPER

PERSONNEL OUTLOOK — For FY '55, major sources to be tapped by AF personnel officers in reaching goals set by the budget are the flying training schools (around 8,500) and AF-ROTC (approximately 7,750, including both flying and non-flying officers). OCS will continue to turn out 500 officers annually. Likewise, a few officers will come from the direct appointment or recall sources. At present, AF anticipates there will be some new warrant officer appointments made during next year. Until the Air Academy is operating at full speed, a limited number of active duty Reservists (in the neighborhood of 500) will be integrated into AF. A token flow will continue, after establishment of the Academy, from the pool of outstanding Reservists, AF says. . . . AF will begin FY '55 with 532,000 or fifty-six percent of its uniformed strength of 955,000 assigned to "operating" forces. AF will raise its "operating" force over 20,000 in one year, according to recent testimony of Defense Department before Congress.

TRAINING — In an effort to meet critical skill shortages in such fields as aircraft controller, communications, electronics, and maintenance, the input rates into training for latter part of this fiscal year have been increased. In this connection, AF is attempting to obtain the maximum return from students who are qualified for communications and electronics training by "channelizing" the normal long-time courses and training them, instead, in specific phases only. For example, instead of training a young maintenance officer in across-the-board radar maintenance, he will be trained as a maintenance officer on a particular piece of critical equipment. And, upon graduation, he will serve in a directed duty assignment. Those ROTC officers who sign voluntary indefinite statements and remain beyond their two-year active duty contract will also be put through the remaining phases of the training. In this regard, major commands are being requested by AF to provide a percentage of all training input in selected hard core fields from their volunteer indefinite onboard officer personnel. AF says this action is an attempt to keep career-minded officers qualified in direct support skills.

NEW BASES — In line with the 137-wing program, AF says it will ask Congress to approve new bases in these areas: Fargo, N. D.; Glasgow, Mont.; Klamath Falls, Ore.; Traverse City, Mich.; and San Diego, Calif. AF will ask Congress to take these sites out of mothballs: Blytheville Municipal Airport, Ark.; Clinton-Sherman Airport, Clinton, Okla.; Columbus AFB, Miss.; K. I. Sawyer Airport, Marquette, Mich.; Moore Field, Tex.; Myrtle Beach Municipal Airport, S. C.; Seymour-Johnson Municipal Airport, N. C.; and Bismarck Airport, N. D.

STAFF — Resignation: Chester D. Seftenberg, Deputy Assistant Sec'y of AF for Reserve and ROTC Affairs. . . . Promotion: Lt. Gen. E. W. Rawlings, AMC commander, to full general. . . . New assignments: Maj. Gen. William O. Senter, commander of San Antonio AMA, Tex.

SHORT STUFF — World-wide chain of storage bases for special weapons is being planned by AF. . . . Top F-84 strategic fighter crews in SAC will compete in SAC's first Fighter Competition at Matagorda Island, Tex., the week of May 17 to 23. . . . AF has awarded Pan American World Airways a contract to assist in the operation of range activities at the USAF Guided Missile Test Center, Cocoa, Fla.

PEOPLE IN THE AIR NEWS

Kyes—retiring May 1.

When Detroit's **Roger M. Kyes** took on the Pentagon's number two job, as Deputy Secretary of Defense, a year ago February, he told his boss, Charles Wilson, he'd stay only a year. Hard-working Kyes, a prime mover in the Defense Department's "New Look," went past his deadline, but his resignation, effective May 1, has been announced by the White House. Kyes had left his General Motors vice presidency to tackle the $22,500-a-year Pentagon job, is staying the three additional months at Wilson's request, who said, "I wish he were staying indefinitely." Kyes' successor: **Navy Secretary Robert B. Anderson.**

Latin America got a first-hand look at US airpower during a 12,000-mile good-will tour of USAF jets led by Maj. Gen. Reuben C. Hood, Jr., Caribbean Air Commander. The **"Wings for America"** road show played to full houses in eleven south-of-the-border republics, featured the antics of supersonic pilot Maj. Chuck Yeager and Luke AFB's Thunderbirds—Maj. Richard Catledge, Capt. Robert McCormick, twin Captains C. A. "Bill" and C. C. "Buck" Pattillo, and 1st Lt. A. D. Brown. Somber note—the death of Capt. Dean L. Ray, who cracked up his F-86 in a pasture near Mercedes Airport, Managua, Nicaragua, to be commemorated in a series of Nicaraguan postage stamps and a new Managua airport named for the dead American pilot.

In 1941, as a result of political differences with the late President Franklin D. Roosevelt, **Col. Charles A. Lindbergh** resigned his commission in the Army Air Corps Reserve. As a civilian consultant (without pay) the famous flyer con-

(Continued on page 19)

Lindbergh.

Yeager and Thunderbirds in Mexico during Latin American good-will tour.

tonight

This man could almost reach the moon tonight... for he stands at the brink of a new age in the conquest of space, and he knows this:

If we had to, we could get him there. Given time and urgent need, we could design, build and deliver the total solution to that problem.

An entirely new development in the aircraft industry now makes this possible. It is known as Systems Engineering... a science and a method of developing aircraft, guided missiles and electronic systems not as traditional flying vehicles but as fully coordinated solutions to operations problems.

Today, Martin Systems Engineering is already in full operation, tailoring airpower to tomorrow's needs. Most of the story is under wraps, but you should know this:

If our security requirements should demand the equivalent of an "Operations Moon," the principles of Martin Systems Engineering would be essential to the solution of that problem.

You will hear more about Martin!

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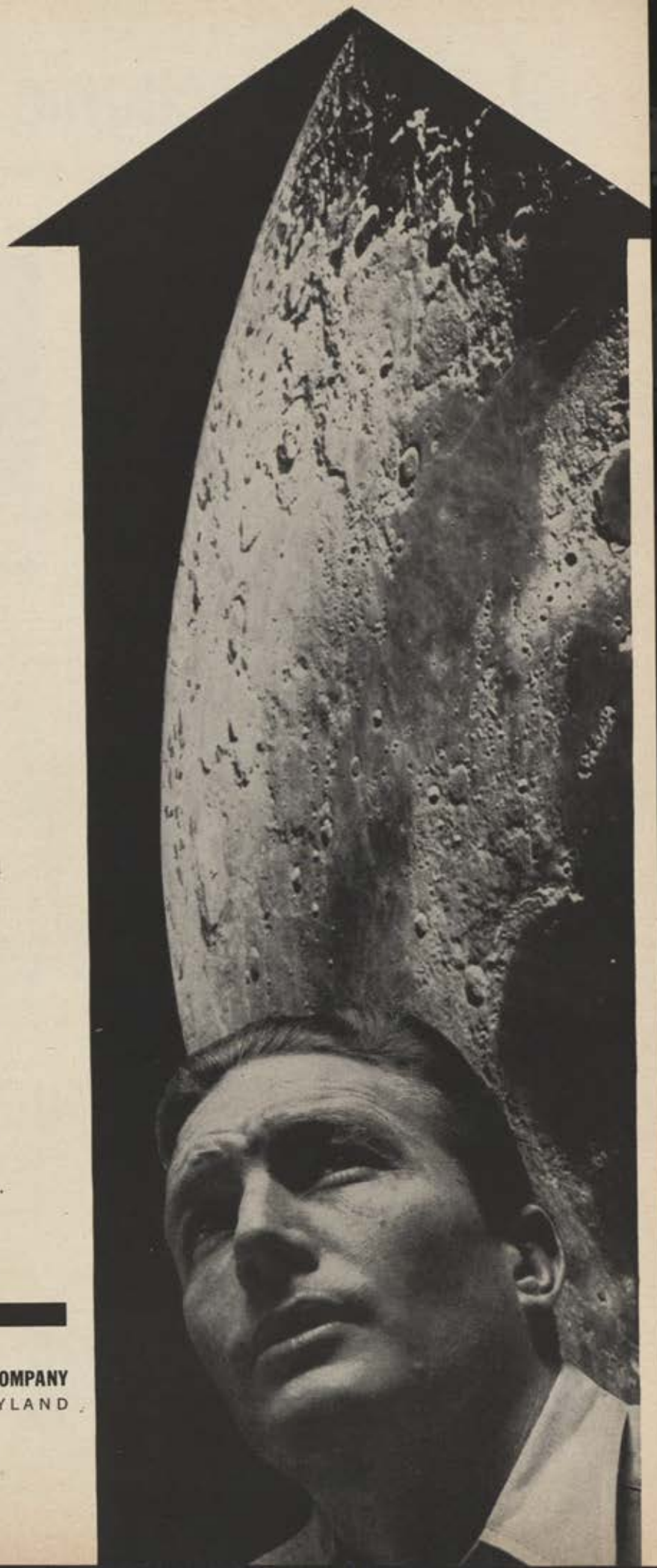

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Look at the facts for the answer to which auto pilot is best. On world-wide, scheduled, commercial carriers of American manufacture . . . where profitable operation is a "must" . . . more than 6 out of every 10 electronic auto pilots are Eclipse-Pioneer. Back of this long-time preference stand these very sound reasons:

- **Eclipse-Pioneer is first in electronic auto pilot experience.** E-P not only produced and installed the first all-electric auto pilot on a commercial plane, but has continued to show the way ever since in auto pilot design, development, and manufacture . . . including production and delivery of *thousands* for military aircraft.
- **Eclipse-Pioneer auto pilots suit a wide range of aircraft.** They're used on every type plane from jet fighters to 4-engine transports . . . including executive and new, long-fuselage, high-performance aircraft.
- **Eclipse-Pioneer auto pilots also offer Flight Path Control (automatic approach).** The addition of FPC provides the complete all-weather answer to automatic approaches and to cross-country flying on VHF *omnirange*. Three airlines are already flying with FPC . . . a number of others are flight-testing it . . . and 56 transport-type aircraft employed in flight-checking all ILS approach installations throughout the continental United States and its possessions are equipped with the full system.

The leadership enjoyed by E-P Auto Pilots is a tribute to the engineering genius and specialized facilities that are so distinctively Eclipse-Pioneer.

**Eclipse-Pioneer Auto Pilots have also been specified for certain foreign-built new transports.*

Eclipse-Pioneer

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tributed much to the war effort from his store of aeronautical skill and experience, including reported extra-curricular victories over Japanese Zeros in the Pacific. After thirteen years Lindbergh was back in the Reserve once more, this time as a brigadier general, with his nomination by President Eisenhower pending expected confirmation by the Senate.

Civil Aeronautics Board examiner **Albert H. Ruppar** took a dim view of radio-TV star **Arthur Godfrey's** aerial antics, grounded him for six months for "reckless" flying. Godfrey's suspension resulted from an incident at the Teterboro, N. J., Airport on January 7, when he allegedly buzzed the tower on take-off.

Last December USAF **S/Sgt. William F. MacDonnell,** Thomaston, Conn., was injured in an aircraft accident in Japan. A couple of months later B-29 gunner MacDonnell headed for the US and further treatment, the two millionth patient in the history of American military aviation to be evacuated by air. His attending physician on the flight from Japan—AF Surgeon General, **Maj. Gen. Harry G. Armstrong,** returning from a Korean inspection trip.

Awards—The 1954 Frank M. Hawks Memorial Trophy to aviatrix **Jacqueline Cochran** "for her outstanding feat of becoming the first lady to fly through the sound barrier." The 1953 Charles Nicholas Hickman award of the American Rocket Society to **Charles E. Bartley,** Director of Grand Central Aircraft Co.'s Propellant Division. The Hickman award is the top distinction given scientists for "advancing the art of rocketry."

Deaths—In New York, of a heart ailment, **George Bryant Woods,** 57—author, inventor, and former special assistant to the Undersecretary of the AF. A veteran of two World Wars and a colonel in the AF Reserve, Woods, a Washington, D. C., resident, authored a book "Aircraft Manufacturing Industry, Present and Future Prospects." In West Los Angeles Veterans Center Hospital, **Maj. Gen. Frederick L. Martin,** 72, who commanded Hickam Field when the Japanese attacked it on December 7, 1941.

Washington arrival—Battle of Britain veteran and former Schneider Trophy racing pilot Air Vice Marshal Richard L. R. Atcherley, to head the AF Staff, British Joint Services Mission.

Donald Calhoun, of Tucson, Ariz., believes in the direct approach. So when he decided he wanted to be an AF officer he went straight to the CO's office at nearby **Davis-Monthan AFB.** Base Commander Col. William J. Wrigglesworth gave him the VIP treatment, showed him around the flight line, answered his questions. But there was no T/O vacancy for a 14-year-old boy so Donald pedalled home to Tucson.

Aspiring airman Calhoun gets the answers from Col. William Wrigglesworth.

An Editorial

WE ARE IGNORING OUR

THIS nation has never accustomed itself to a professional military force. Indeed, we boast of the fact, as if it were a cornerstone of democracy.

We still like to think about arousing a military force after the danger is upon us, and about sending the boys back home, even before the danger is over, as we did in World War II.

Our fetish for "springing to arms" in an emergency has prevented us from clearly thinking out our national defense problem. And, if the "springing" has each time proved costly in life and treasure, we have been thus far willing to pay the price. It has seemed preferable to a large standing force.

Now the new weapons of war are fast eliminating our choice in the matter. We will barely have time to spring to our air raid shelters in the age of atomic destruction.

Whether we like it or not, security under arms is the order of the day and, as our leaders have told us, may continue for decades or even a century. It is high time we became more mature about the men we hire to defend us.

The history of German military success against the French in World War II clearly reveals the overwhelming superiority of the quasi-professional force when arrayed against the quasi-amateur force. Germany did not conquer France with superiority of manpower, in numbers; Germany conquered by virtue of the superior capability of its military force, even when outnumbered.

We Americans take pride in having the best of everything, but we have not demonstrated our pride in achieving and maintaining the world's best military establishment.

The test is not in wartime, when patriotism runs high. The real test is before us today, when we are called upon to support a large professional military force within our peacetime social structure.

Our support has been shabby, at best. As a nation, we have not let our military people feel that their efforts are appreciated. We go through the motions, but true respect is lacking. We look down upon military service as a career.

We cannot expect men of the necessary caliber to enter the military on a voluntary basis until their neighbors, all of us, look upon the bearing of arms as an honorable occupation, with the prestige which it deserves. We cannot expect to retain men of the right type in the military service unless the bearing of arms becomes, in fact, an honorable occupation.

The inability of the services to retain experienced and qualified men is the greatest single weakness in our military structure. The record is shocking. The Strategic Air Command, the nation's key military unit, lost some 5,000 officers and 25,000 airmen through voluntary

discharges during the last year. Due to the high turnover rate, fully eighty-five percent of the men in some of SAC's most important job categories are apprentices. Yet we expect this organization to be in a constant state of combat readiness.

The services themselves must share part of the blame for the steady flow of highly skilled men from military life. But our share—the public's share—is a heavy one.

This outlet of 25,000 airmen from the Strategic Air Command represents an estimated loss of some $50,000,000 in formal training time which the taxpayer has provided for these men, without considering the cost of training the men to take their places. It has been estimated that the abnormal turnover of people in the Air Force alone is costing the taxpayer more than $2 billion this year.

Every serious study of the turnover rate reflects lack of support for the military man on the part of the civilian community.

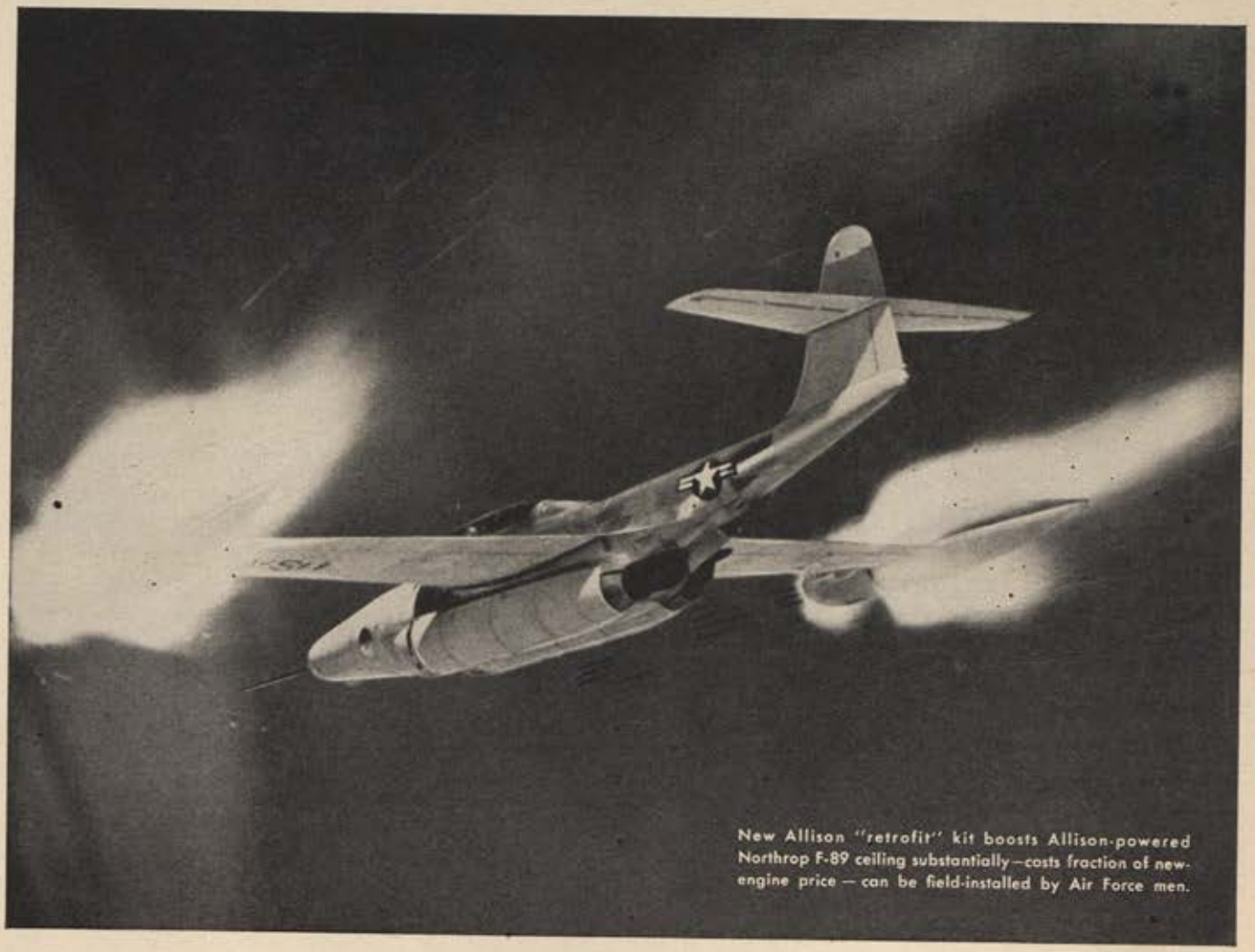
It is merely basic economics to realize that the best military capability can be procured for the least money by a military establishment which at least has a backbone of professional character. It can be shown that the best way and the cheapest way to defend our country is with a professional or quasi-professional military force. This, of course, goes against the national grain. It runs headlong into the old theory that each must do his bit and, in the end, must do it whether he likes it or not, and whether or not he can be made into a capable military man. If the military service were actually attractive, if there were some competition to get into it, this situation would not prevail.

A respectable military force can be obtained only if it is believed that the military worker is worthy of his hire.

The one way to get men without regard for their market worth is to draft them, and they will leave military employment at the first opportunity. The one way to keep them in military service is to give them a package which adds up to reasonable incentive and reasonable security. The package may not parallel civilian life in monetary gain, but the total should compare with civilian experience. The package may consist of direct pay, fringe benefits, and security for the long pull. It must include the respect and prestige of the civilian community.

As a nation, we will be in the military business for a long time to come. In the tradition of America, we deserve the best military force in the world. With the complexity of new weapons, we can no longer get the best with a quasi-amateur force, especially short-term enlistees. And in the long run, a quasi-professional military force is the most economical of all security forces.

Civilian understanding and support of the military man is an essential ingredient of our military posture. Such support is, in the last analysis, our finest military asset—part and parcel of our national security.—END



New Allison "retrofit" kit boosts Allison-powered Northrop F-89 ceiling substantially—costs fraction of new-engine price — can be field-installed by Air Force men.

Rocket firing jets reach new heights

Air Force and Allison engineers have put their heads together to save the taxpayers' money and get higher-altitude performance from veteran Northrop F-89 Scorpions. They developed a field modification kit which gives the earlier Allison J35 models the performance of the latest production model engines and boosts the Scorpion's ceiling substantially—at only a fraction of the cost of a new engine.

These "retrofit" kits can be installed by Air Force Maintenance Crews on a minor repair basis *right in the field*. Already well started, the modification program will cover several hundred Scorpions assigned to the Air Defense Command at bases in the United States, and to the Alaskan and Northeast Air Commands guarding transpolar routes to America's heartland.

This is another good example of Air Force-Allison cooperation to give America the most airpower per dollar. This teamwork started in World War I and, continuing today, is an important factor in maintaining America's superiority in the air.

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Where the Gang gets together

42D DEPOT REPAIR SQDN.: Former members of the 42d Depot Repair Sqdn., 42d ADG, regardless of whether it was overseas or in the states, please contact *Jack Dewey Helms, 600 North West Ave., El Dorado, Ark.*, regarding a squadron reunion.

493D BOMBARDMENT GROUP: Can anyone tell me whether or not a history of the 493d Bombardment Group during World War II was ever published, and if so where could I get a copy? *Charles W. Gray, Lear, Incorporated, 11916 West Pico Blvd., Los Angeles 64, Calif.*

96TH BOMB GRP. (H): Did the 96th Bombardment Group (H), 8th AF, stationed in England during WW II ever have a history published? If so I would like information as to obtaining a copy. *Edward L. Gordon, 5143 Gaylor Ave., Encino, Calif.*

B-17G MODEL: I am trying to get a model of a B-17G. Does anyone know where I can obtain one? *Murray Brown, D.M.D., 108 University Rd., Brookline, Mass.*

PAINTINGS AVAILABLE: *Not as Briefed*, a collection of color reproductions of seventy-five paintings of combat scenes, POW camp life, and portraits of well known inmates of Stalag Luft One, is now available. This book was painted entirely in POW camp by Col. C. R. Greening during the last part of the two years he was a prisoner. Many POWs got the first copy of the book but the number available was insufficient to supply the demand. Some copies have recently been bound and can be bought for $6. Each air battle depicts a true event which usually resulted in some American becoming a POW. If interested in a copy of this book write to *Col. C. R. Greening, Air War College, The Air University, Maxwell AFB, Ala.*

376TH: Anyone know the address of the 376th Bomb Group Association? *Frederick D. Little, Star Route, Londonderry, Vt.*

MAJ. BROWN & CAPT. BAILER: Anyone knowing the whereabouts of Maj. James J. Brown or Capt. Harold J. Bailer, of the old 442d Troop Carrier Group, please notify *J. E. McNeil, Box 851, Bellville, Tex.*

To be sure your Rendezvous item appears in the June issue, we should have your request by April 15.— THE EDITORS.

FACTS ABOUT

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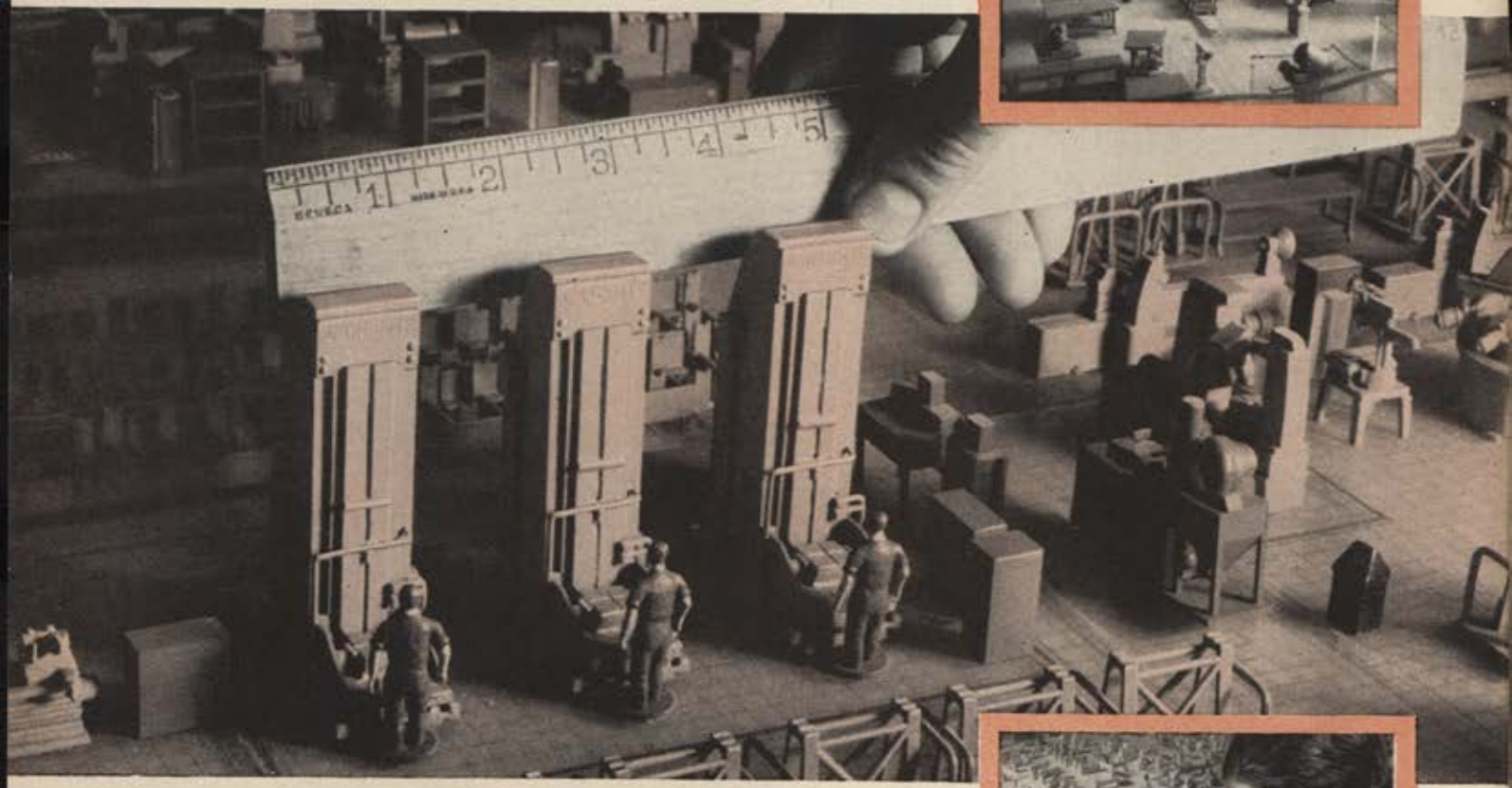
Engine Division

PRODUCTION ENGINEERING



3-D . . . in miniature . . . has an important production engineering role at the Fairchild Engine Division. Scaled-down duplicates of the big production lines save countless dollars and untold man hours . . . make possible complete pre-planning before actual production of turbojet engines, auxiliary powerplants and other power products begin.

Miles of blueprints for new floor plans are eliminated. Instead, technicians simply arrange scale models to arrive at the most efficient production layout. Then, actual plant layout is set up to agree with the scale layout. Advanced techniques like this are a part of *planned* production engineering at Fairchild . . . pushing efficiency up and costs down on major projects for *all* the Armed Services.

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AIR FORCE
APRIL 1954

Boeing B-52.

Some Reflections on

THE 'NEW LOOK'

History may show that the massive retaliation policy marked the turning point in the Free World's dealings with Communism

An AIR FORCE Magazine Staff Study

IN AN unheralded but historic address before the Council on Foreign Relations in January, the Secretary of State introduced what has been widely accepted as a major alteration of our military strategy.

"So long as our basic policy concepts were unclear," said Secretary Dulles, "our military leaders could not be selective in building our military power. If an enemy could pick his time and place and method of warfare—and if our policy was to remain the traditional one of meeting aggression by direct and local opposition—then we needed to be ready to fight in the Arctic and in the tropics; in Asia, the Near East, and in Europe; by sea, by land, and by air; with old weapons and with new weapons. . . .

(Continued on following page)

John Foster Dulles, Eisenhower's Secretary of State.

Adm. Arthur Radford, Chairman, Joint Chiefs of Staff.

THE 'NEW LOOK'

CONTINUED

"But before military planning could be changed, the President and his advisers, as represented by the National Security Council, had to make some basic policy decisions. This has been done. The basic decision was to depend primarily upon a great capacity to retaliate, instantly, by means and at places of our choosing. Now the Department of Defense and the Joint Chiefs of Staff can shape our military establishment to fit what is *our* policy, instead of having to try to be ready to meet the enemy's many choices. That permits of a selection of military means instead of a multiplication of means. As a result, it is now possible to get, and share, more basic security at less cost."

History may well show that the "massive retaliation" policy of the Eisenhower Administration marked the turning point in the Free World's successive retreats and indecisive stalemates in dealing with the onrushing tide of aggressive Communism.

Meanwhile, however, the policy itself has been criticized as the cornerstone of a brash, inflexible, and even dangerous "single weapon" strategy, that weapon being the strategic air-atomic power of the United States Air Force. The new defense budget announced within a few days of the Secretary's address likewise was interpreted as supporting this view.

As a result the Air Force has been held up as an all-purpose answer to our security problem—and then slapped down with criticism for not being able to do the whole job.

For example, it has been widely claimed that "massive retaliation" provides no real answer to local wars. In his address Secretary Dulles seemed to anticipate this criticism. "We do not," he said, "claim to have found some magic formula that ensures against all forms of Communist successes. It is normal that at some times and at some places there may be setbacks to the cause of freedom. What we do expect to ensure is that any setbacks will have only temporary and local significance because they will leave unimpaired those Free World assets which in the long run will prevail."

Commentators generally have interpreted this statement to mean that the United States is prepared to accept, at its discretion, some local expansion of Communist control, and to forego resisting such aggression in some instances not yet specified.

But is this the case? In an address last month, Admiral Arthur Radford, Chairman of the Joint Chiefs of Staff and a key figure in the interpretation and implementation of the "massive retaliation" policy, made this statement to the Economic Club of New York:

"The Free Nations can ill afford to let a single additional area fall behind the Iron Curtain. Though it often seems unclear, and is sometimes deliberately obscured, it is as simple as A-B-C. Aside from the tragedy to the people conquered, Soviet domination means that these people and their resources will be harnessed to the Soviet war machine, and may be turned against us."

Admiral Radford, in a brilliant speech, also supplied an answer for those who are apprehensive that the new policy places unwarranted reliance on one strategy, one weapon, one military service.

"Our planning," said Admiral Radford, "does *not* subscribe to the thinking that the ability to deliver massive atomic retaliation is, *by itself*, adequate to meet *all* our security needs. It is *not* correct to say we are relying exclusively on one weapon, or one service, or that we are anticipating one kind of war. I believe that this nation could be a prisoner of its own military posture if it had no capability, other than one to deliver a massive atomic attack.

"It should be evident from the forces we intend to main-

tain that we are not relying solely upon airpower. We shall continue to have over a million men in our Army, and we shall continue to have a Navy that is second to none. We have never before attempted to keep forces of this size over an indefinite period of time.

"The program for our Armed Forces is more a matter of emphasis. We are putting emphasis on our advantages, our long suits, in other words, on airpower, on new weapons, and on a high state of combat operational readiness. We are placing emphasis on a ready reserve, mobility and flexibility, not for any one date, but for now and for the indefinite future."

And to those who argue that the importance of both the Army and Navy has diminished under the "new look," Admiral Radford went on to say:

"As the importance of airpower and new weapons increases, it does not necessarily mean that the importance of ground and naval forces decreases. Actually, each of our armed services is essential. Each has vital roles to perform. By no means are we divesting ourselves of our capabilities in other essential arms and forces. The effectiveness of the Army, Navy, and Marine forces will continue to be improved with better equipment, new weapons, and a better planning of reserve components. We must have strong, mobile, combat-ready units capable of being projected wherever required."

The "massive retaliation" policy of the Administration—which obviously deserves much further official clarification—apparently was accomplished by a separate but equally momentous decision: to use nuclear weapons, in the event of local or general war, wherever the military situation warrants. Here, the authors of the "new look" have come under the heavy fire of those who insist, first, that nuclear weapons would be relatively ineffective in Korea-type operations and, second, that even if effective their application would be at the expense of our Allies and probably lead to general war. Let us consider these criticisms in turn.

Various statements by responsible government officials have laid great stress on the availability of tactical nuclear weapons in various sizes for different purposes. This would appear to enhance our ability both to *localize* a conflict and to *fight it decisively*. And this should be particularly true now and for the near future when the limited Soviet nuclear stockpile does not allow the Communists the flexibility of responding in kind, without being "caught short" of nuclear weapons should a general war occur through miscalculation on either side.

The application of tactical nuclear weapons to a conflict for Western Europe is not too difficult to visualize. If the Soviets should strike at Western Europe, a prompt and determined tactical atomic campaign delivered on airfields, ammunition and supply dumps, bridges, and railroad yards could reduce Soviet tactical air forces and armies in the field to something approaching impotence in a few weeks—perhaps even days. Furthermore, a very great number of the tactical targets attacked would be *on Soviet territory;* and the use of precise delivery and tactical bombs would concentrate atomic destruction on military targets, on both Soviet and statellite territory. Thus, the policy of using nuclear weapons does not necessarily mean a lessening of reliance on NATO, but rather the capability of deterring Soviet aggression against Western Europe with forces which the NATO nations can afford to support over the long pull.

In fact, such a war—with unprecedented violence *against military targets*, compressed into a short space of time—appears to be the only war we could fight decisively, with any hope of seeing Western Europe rise again afterwards. Should we lack the courage to do so, if the Soviets attack Western Europe, the sweep of the Red Army and Communist purges among the free peoples of those countries would leave scars on mankind far deeper than those of tactical atomic warfare.

But what about the use of tactical atomic weapons in a situation like Indo-China? The answer to this question is less clear at the present time. And, indeed, Administration spokesmen have intimated that they do not consider the new policy applicable to Indo-China. And they can take this position with some logic, since it is difficult to apply a new policy to a situation which, at least in part, may well have come about through previous lack of such a policy.

But the Dulles policy does imply the possibility of atomic attack outside the area of conflict. This could mean many things—tactical atomic bombing of Chinese Communist airfields, supply dumps, and war industries; or of trans-Siberian supply trains. If these did not suffice, it might mean—after appropriate warning—the bombing of Peiping. At this point, one encounters the charge that instant atomic retaliation inevitably would lead to general war.

What would happen if we bombed Chinese airfields and supply dumps near the Indo-China border, to halt Ho-Chi Minh's aggression? Would the Soviets attack American cities, as the terms of the Chinese-Soviet alliance would allow?

It is, of course, an uncertain business to speculate about enemy *intentions*. For one thing, they are only known to a very small, tightly-knit group in the Politburo. Beyond that, they can change rapidly and drastically in a dictatorship, through the miscalculation, desperation, or frustration of perhaps one man. However, speculation on Soviet *intentions* is not the key to a sane outlook on the risk of general war inherent in the policy of retaliation. Rather, that key is knowledge of Soviet *capabilities*.

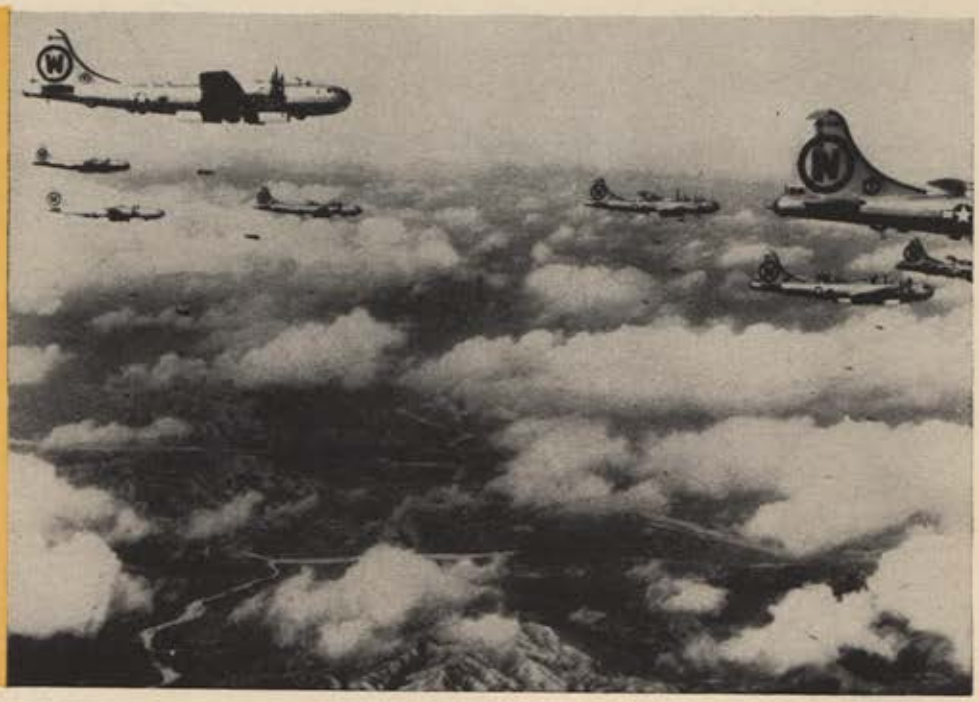
It is highly improbable that the Soviets would attack American or NATO-countries' cities without the *nuclear weapons and delivery capability to inflict major damage on* the US Strategic Air Force; the NATO Tactical-Atomic Air Forces; the US production base. We should understand,

(Continued on following page)

Administration spokesmen have indicated they don't consider the new policy applicable to Indo-China.

however, that the Soviet estimate of what they can do to us may be considerably different from our own assessment of Soviet capabilities.

Any attack upon our cities or the capitals of Western Europe without this capability—without the ability to deliver a decisive initial blow—would be an act of insanity and suicide for the Soviet regime (although still possible, due to the notorious volatility of dictatorships). For the Politburo has been told unequivocally—by Presidents Truman and Eisenhower—that we posses an overwhelming retaliatory capability.



Would casualty figures have been lower in Korea if we had been free to use the A-bomb when the Chinese intervened in 1950?

If we achieve and maintain air-atomic superiority, the Soviets may never achieve the capability required to risk an all-out nuclear exchange. Therefore, if we keep our overall military capabilities sufficiently ahead of those of the Soviets, we cannot logically fear an all-out war *solely* as a consequence of decisive, tactical atomic reaction to local aggression.

It should be clearly understood here that keeping ahead of the Soviet militarily does not mean building up our strategic air alone, but also putting far greater emphasis on widely dispersed tactical atomic air forces, on air logistics, and on air defense. This will require large sums of money *to keep pace with the Soviet investment in armed forces of aggression*, and it may require much larger defense budgets in the coming years.

It has been stated that the new armaments, upon which we are now placing greater reliance, will automatically increase the budget over the years. It is true that nuclear weapons are considerably more expensive than conventional bombs or artillery shells. It is also true that the B-52 is more expensive than the B-36 which it will replace. However, the total costs of destroying a target—a strategic target such as a Soviet long-range bomber airfield or atomic production complex, or a tactical target such as a bridge or railroad marshalling yard—have been greatly reduced by nuclear weapon developments.

The so-called "delivery capability" accounts for the greatest portion of the cost of destroying a specific target. As times goes on, the enemy's defenses improve and we need new—more expensive—delivery vehicles. However, a wide variety of nuclear weapons now makes it possible to destroy a single target in just one attack. Furthermore, nuclear weapons are being packaged in progressively smaller sizes, thus making possible the limited use of modern fighters in the role of strategic bombers. Thus, both the "sortie" requirements, and the size of some of the delivery aircraft used, and with them the over-all costs of waging war, can be markedly reduced by using nuclear weapons.

These are some of the military problems posed by the "new look." Beyond them are questions even broader in scope, involving our entire national philosophy regarding the use of nuclear weapons. For example, are nuclear weapons immoral? Do they make meaningless any attempt at disarmament?

It's been said that nuclear weapons are immoral. But so is war itself. So also are those regimes which use war aggressively as an instrument of national policy. But the question remains: Will the use of nuclear weapons increase casualties (combatants and "innocent" civilians) in the event of war? Most writers seem to assume that the answer to this question is an unequivocal: "Yes!" But is this necessarily so?

To commit aggression, the aggressor must—or can be forced to—mass his forces for offensive action. In Korea, for example, the Communists massed their military strength in a manner which presented lucrative tactical atomic targets several times—as they first crossed the Thirty-Eighth Parallel, as they closed in on Pusan, as the Chinese "volunteers" crossed the Yalu. And, of course, Communist airpower was concentrated throughout the war on a few airfields just across the Yalu. Could it be that a well-planned tactical atomic attack might have heavily damaged and routed the aggressor? If this had been done "early in the game," might it not have actually served to reduce the total number of casualties eventually suffered by both sides? A number of military experts say yes.

Meanwhile, what about the morality of the strategic use

of nuclear weapons in total war? Some writers believe that almost any strategic use of nuclear bombs involves the slaughter of civilians. In a *surprise* attack, this would certainly by true. However, neither we nor our allies are planning to launch a surprise attack. Furthermore, Marshal of the RAF Sir John Slessor, author of the British "new look," has clearly stated that: ". . . the first step would be a clear warning in secret [against] any attempt at a solution by force. . . . If that did not work . . . the people concerned should be told clearly—by radio and pamphlets dropped from the air—what will happen if their government uses force, and warned to evacuate a specified list of cities. . . ." Such action would concentrate atomic destruction on the enemy's war-making machinery and cities, provided the Communists were unable to prevent the populace from obeying the evacuation warnings.

There has been no clear-cut, semi-official US announcement of intent to warn target populations, similar to that of RAF Marshal Slessor's in Great Britain. There are important questions involved. Since the Soviets might heavily jam radio transmissions, we would have to drop leaflets, at least in some cases. This means air penetration of Soviet territory and, of course, provides an excellent air defense exercise for the Red air force; this could only lead to heavier bomber losses on our side if the solemn warning failed and the war began.

It can be seen that this issue is a complex one, which cannot be resolved by a discussion as brief as the one presented. However, it appears certain that the use of nuclear weapons in war *need not* raise the grave issues of morality which, at first thought, come to mind.

But do we sacrifice our hopes for disarmament and lasting peace through reliance on air-atomic power?

President Eisenhower, in his dramatic speech before the United Nations, stated that we are ready to enter into private diplomatic discussions of the disarmament problem, and prepared to take a new conception into such talks.

These proposals were made before Secretary Dulles' foreign policy speech on "massive retaliation." And there are now those who fear that reliance on nuclear weapons for defense will tie our hands in the disarmament negotiations; or that, if we agree to nuclear disarmament, we will have no "conventional" forces to counter those of the Soviets and maintain the world balance of power.

Any Soviet acceptance of the principle of outlawing nuclear weapons *and* submitting to foolproof international inspection and control would, of course, have to be tied in with an agreement to reduce the USSR's immense superiority in troops, artillery, tanks, and other conventional armaments, as proposed by President Eisenhower last April. Furthermore, any disarmament program would be meaningless unless it went beyond the mere hardware of war. The Soviets would have to abandon their large-scale programs of world-wide subversion and their viciously slanderous propaganda machine. The latter course of events is not very probable. It is even less probable that a disarmament program would have any real meaning whatever, unless it guaranteed the elimination of all "instruments" through which the Soviets seek to carry out their program of world domination.

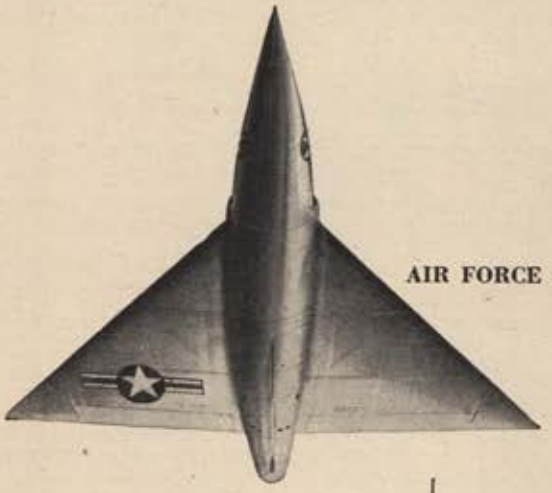
Bomb pattern in Korea. In case of aggression in Europe, tactical targets would be hit by atomic weapons.

The principal obstacle to disarmament, therefore, is not our reliance on nuclear weapons for defense, but rather Soviet determination to put over the kind of disarmament program which—in the short or long run—would leave the Free World defenseless.

Thus the world moves on among the grave perils and uncertainties of the nuclear age. Humanity gazes across the vast air spaces, not knowing whether the next vapor trail signals merely the flow of ideas and commerce, or the destruction of all that man has patiently built over the centuries. Perhaps, with time, as the full implications of man's technical "progress" are grasped by all, total war will become obsolete. If it does not, the history of man's great failure may indeed prove too painful to write for those who remain upon the earth, after the dust has subsided.—END

Our Crystal Ball

We figure if a prophet is without honor it's his own darned fault, so here are some AIR FORCE Magazine 'firsts'



AIR FORCE version.

US Air Force version.

WHEN the Air Force and Convair, on February 27, jointly released the first pictures of the F-102 supersonic delta-wing interceptor, the Editors of AIR FORCE were relieved to find that the photographs pretty well bore out the artist's conception of the same aircraft which had appeared on our cover (December 1952) fully fourteen months earlier. (See photographs.)

Someone then pointed out, in one of our editorial bull-sessions, that the Associated Press report on the same aircraft's first flight test, on October 24, 1953, quoted AIR FORCE Magazine as terming the "F-102 an 'inhabited missile' in which the pilot—except for take-offs and landings—'becomes scarcely more than a flesh-and-blood monitor for the little black boxes which do the work.'" There may be nothing as old as yesterday's newspaper, as the saying goes, but evidently our ten-month-old article was still the best available source of publishable information.

It then occurred to us that other recent news stories had a familiar ring, so we assigned the junior member of the staff to dig up some evidence. Here it is:

AIR FORCE Magazine, June **1952**—"Soon a few men in one airplane, flying at sonic speeds and never seeing the ground, will be able to drop anywhere on the face of the earth a single bomb containing an explosive power far greater than the total dropped during World War II."

Representative Sterling Cole, Chairman, Joint Committee on Atomic Energy, in a speech Feb. 17, **1954**—"We are now crossing the threshold into an age when one plane, carrying one hydrogen bomb, can unleash on a target a cargo of destructive force exceeding all the TNT dropped upon Germany, Japan, and Italy combined throughout all of World War II."

AIR FORCE Magazine, July **1952**—"AIR FORCE Magazine is now able to say for the first time that a plan is being considered at the highest policy levels which envisages the application of nuclear energy as the key to a revolutionary new air defense system. Heretofore confined to an offensive role, the A-bomb, under this system, would make it possible for the United States to cope successfully with atomic attacks by piloted aircraft."

Representative Cole, February **1954**—"Today it is possible to manufacture small-size atomic weapons specifically adapted to anti-aircraft defense. The destructive range of these devices is such that they could assure hitherto unattainable degrees of success in destroying hostile bombing fleets."

AIR FORCE Magazine, February **1951**, in an article by the late William S. Friedman—"We actually know very little about the Tupolev answer to the B-36 [but] we know definitely that there is such a prototype about ready to fly. . . . My reports state that the 'Russian B-36' is currently in the prototype stage and is scheduled to make its first flight test sometime within the next three months. . . . We can expect them to have a production model of their modernized B-36 type bombers *at least by 1954*." (In the same issue we carried an artist's conception of the aircraft which compares strikingly with recently published photos, particularly if one considers that three years have passed.)

AVIATION WEEK, February 15, **1954**—"Andrei Tupolev, long identified with bomber design in Russia, and adapter of Boeing's B-29, is the designer of the biggest Red aircraft so far. With a span of 236 feet and an over-all length of about 200 feet, the Tu-200 can be compared directly only with the Convair B-36."

At this point, the oldest-timer on the editorial staff grunted, "That's nothing. I remember back in our October 1947 issue Charlotte Knight called the Thirty-Eighth Parallel in Korea 'our most dangerous boundary.'"

"And Johnny Driscoll put the finger on Indo-China in the January '53 issue," put in the junior member.

That's where we called a halt to reminiscing. Looking back on past prophecies was fine, we all decided, but it couldn't go on forever. The feet came off the desk and went back under the typewriters. There was the next issue to worry about.—END

WHAT GIVES WITH THE RESERVE PROGRAM?

There's no simple answer to this question, which thousands have been asking

By Edmund F. Hogan

A FEW weeks ago a captain from Florida wrote a letter to AIR FORCE Magazine in which he reported trying vainly, on two occasions since the Korea war ended, to become active in the Air Force Reserve. "What," he concluded, "gives with the Reserve program?"

For purposes of practical historical record, the Air Force Reserve program began back in 1946. After eight long years of trial and error, starts and stops, changes and revisions, what *is* the answer to the jackpot question posed so neatly by the correspondent from the South?

The unvarnished truth is that the Reserve program is still being worked on and its final form has yet to be shaped. There is, however, tremendous current activity on the Reserve front which begins to promise the Reservist a brighter future.

Indeed, a major step toward a more effective Reserve program may already have been taken by Continental Air Command, which has just announced establishment of fifty new Air Reserve Centers throughout the nation. These will be located in twenty-two cities under First Air Force jurisdiction, twelve under Fourteenth Air Force, nine under Tenth Air Force, and seven under Fourth Air Force. Twenty-eight of them will replace the old Air Reserve Districts and Reserve Specialist Training Centers. Twenty-two substitute for the old Volunteer Air Reserve Groups.

All fifty centers, ConAC hope, will be in operation by the end of June. In fact, twenty are scheduled to be activated this month. The centers

(Continued on following page)

INCREASED ACTIVITY ON THE RESERVE FRONT PROMISES A BETTER FUTURE

The accompanying article does not propose to answer the question posed in the title. It does give Reservists needed background on recent developments in the Reserve program:

- **The Appley Report, which was concerned with manpower available to the military.**
- **The study made by the National Security Training Commission.**
- **Conclusions reached by an Air Force Board, headed by Lt. Gen. Leon Johnson.**
- **Recommendations made by the Reserve Forces Policy Board of the Secretary of Defense.**
- **Findings of a Senate Armed Services Subcommittee.**
- **Opening of 50 new Air Reserve Centers, combining features of the old District, VART, and STC programs.**
- **Material available to a Pentagon task force, which will recommend a program pointed to the future.**
- **Here is background against which any future program can be assessed. We believe every Reservist will find it useful.**

The Editors

AIR RESERVE CENTERS

These fifty new centers should lead to a better Reserve. The availability of suitable facilities has not been established in all cities listed.

Location	Organization Month, 1954
FIRST AIR FORCE	
New York, N. Y.	April
Baltimore, Md.	April
Louisville, Ky.	April
Cleveland, Ohio	April
Richmond, Va.	April
Buffalo, N. Y.	April
Columbus, Ohio	April
Philadelphia, Penna.	April
Pittsburgh, Penna.	May
Boston, Mass.	May
Albany, N. Y.	May
Washington, D. C.	May
Springfield, Mass.	June
Newark, N. J.	June
Providence, R. I.	June
New Haven, Conn.	June
Hartford, Conn.	June
Rochester, N. Y.	June
Dayton, Ohio	June
Wilkes-Barre, Penna.	June
Syracuse, N.Y.	June
Harrisburg, Penna.	June
FOURTH AIR FORCE	
San Francisco, Calif.	April
Los Angeles, Calif.	April
Seattle, Wash.	April
Portland, Ore.	May
Salt Lake City, Utah	May
Sacramento, Calif.	May
San Bernardino, Calif.	June
TENTH AIR FORCE	
Chicago, Ill.	April
Detroit, Mich.	April
Denver, Colo.	April
Omaha, Neb.	April
St. Louis, Mo.	April
Minneapolis-St. Paul, Minn.	May
Kansas City, Mo.	May
Indianapolis, Ind.	June
Milwaukee, Wis.	June
FOURTEENTH AIR FORCE	
Birmingham, Ala.	April
Ft. Worth, Tex.	April
Tampa, Fla.	April
Oklahoma City, Okla.	April
Charlotte, N. C.	June
New Orleans, La.	June
Houston, Tex.	June
Tulsa, Okla.	June
Atlanta, Ga.	June
Austin, Tex.	June
Shreveport, La.	June
Nashville, Tenn.	June

WHAT GIVES WITH THE RESERVE?—CONTINUED

will have ninety-nine groups and 463 squadrons and will offer both general and specialized training.

The numbered Air Force will announce the opening of each center in its area. But lest Reservists rush posthaste to centers as they open, ConAC recommends patience. The program is big and it's new. Centers must be manned, and, frankly, they will not be geared to take on a full load of Reservists on opening day or in the first week thereafter.

Essentially, this new approach attempts to combine the best features of the old District, VART, and STC programs. It emphasizes units, the traditional military type of organization for which most Reservists have been asking since 1946. The centers could give the Reservist the feeling of belonging and pride in unit integrity he has long sought.

The fifty new centers are exclusive of, and in addition to, the twenty-five Reserve flying wings. These include nine Troop Carrier, six Fighter-Bomber, six Pilot Training, two Tactical Reconnaissance, and two Air Depot Wings. But there is a common bond between the two.

In the old specialized training set-up, officers and airmen were assigned to separate units. In the new program, both may be members of the same squadron, just as in a flying unit. There is another resemblance. As transfers between jobs can be effected speedily within a flying unit, so in the new center arrangement a Reservist will be able to switch from general to specialized training, or vice versa, without the red tape he used to wade through in transferring from a VART squadron to an STC squadron.

Currently, the Reserve Records Center in Denver has on file about 237,000 Reservists. But some 180,000 of these are assigned to the Non-affiiated Reserve Section and Ineligible Status List Reserve Section —usually referred to as NARS and ISLRS. ConAC planners hope that thousands of these Reservists in NARS and ISLRS now can become affiliated with a unit and participate actively in the Reserve program, since the centers are widespread, geographically.

In the present set-up, the centers will be commanded by active duty officers, probably full colonels. But the groups and squadrons under them will be commanded by Reservists. And Reservists affiliated with the centers who take specialized training will get a planned twenty-four paid drills a year and fifteen days of field training.

Each center will have an advisory board to counsel the commander on policies and training. Group and squadron commanders are pegged for membership on this board.

It would be gilding the proverbial lily to suggest that the new Air Reserve Center is the final form of the Reserve program. This decision has not been reached. But the center has such flexibility that it can remain the hub of Reserve activity no matter what future developments occur. And there are bound to be future developments.

Within the last year, there have been five major studies of the Reserve program—and a sixth is due momentarily. The first was completed last August by the Reserve program Review Board, appointed by the Chief of Staff and headed by Lt. Gen. Leon Johnson, ConAC's commander.

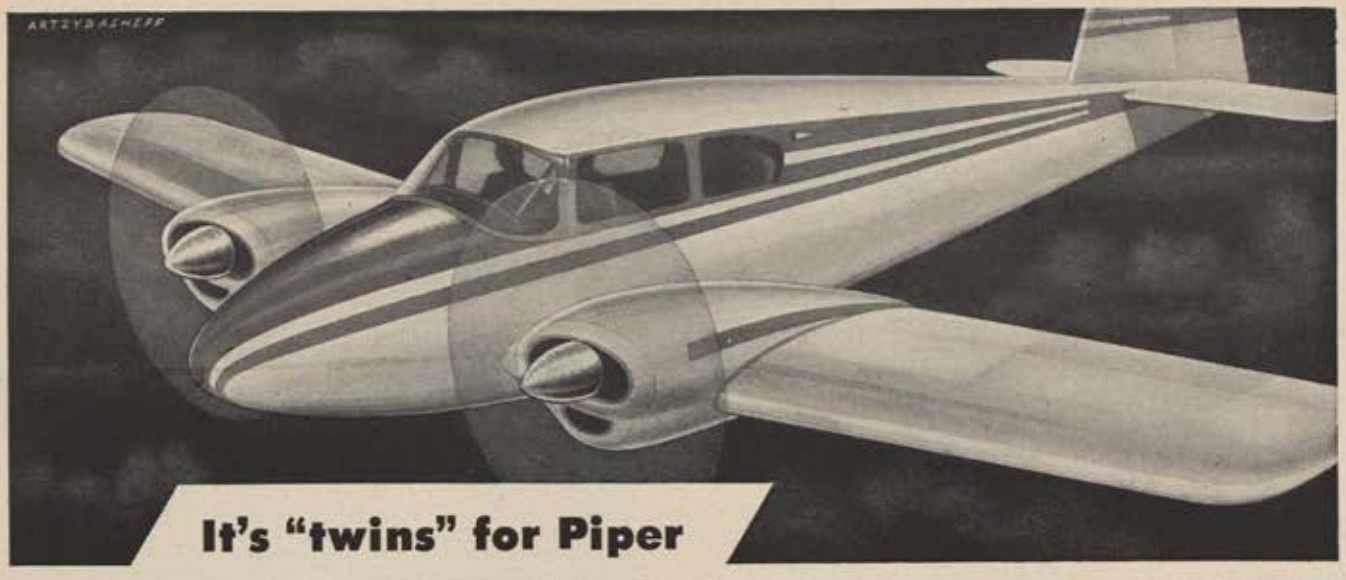
The Johnson board came up with twenty-three recommendations, one being the establishment of the aforementioned Air Reserve Centers.

The Johnson Board also took a look at the Long Range Reserve Plan and suggested that it be scaled down from 507,000 to 176,000 participating Reservists by June 30, 1958. The Board reasoned that the lower figure "is one that can be attained and maintained by a well-conducted and supported training program." In other words—realistic.

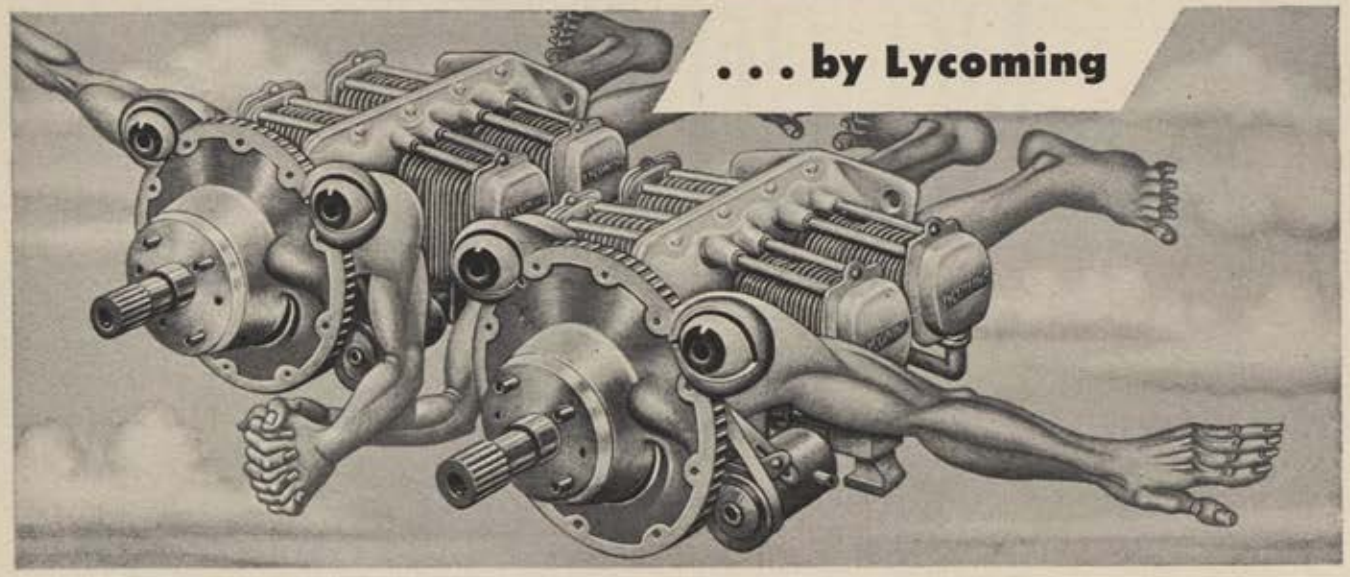
But—and this is the important but —no one yet knows what the long-range figure will be. And until the mission of the Reserve is spelled out in words of one syllable, then translated into numbers of units of specific types and individuals with Air Force Specialty Codes which the misson demands, there can be no guarantee that any current program is "firm."

Even while the Johnson Board was deliberating, another group was in session. This was the National Security Training Commission, created by Public Law 51, 82d Congress, and headed by Julius Ochs Adler, general manager of *The New York Times* and a Reserve Army major general. It found the whole Reserve program—Army and Navy, as well as Air Force—in need of a transfusion. The Adler Committee, complying with provisions of Public Law 51, submitted a plan calling for six months of National Security Training (UMT) to be followed by compulsory service in the Reserve.

(Continued on page 35)



It's "twins" for Piper



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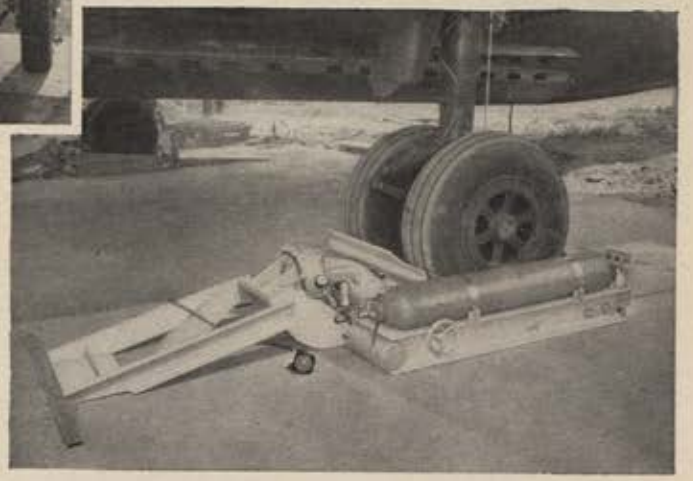
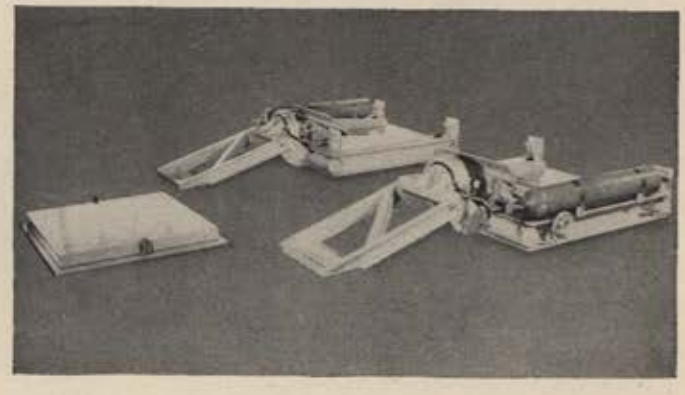


"GO" or "NO GO"



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RESERVE——CONTINUED

At the very moment President Eisenhower appointed the Adler Committee, he fired a communique to Arthur S. Flemming, Director of the Office of Defense Mobilization, which ordered ODM to make a study of the manpower available to operate simultaneously a military training program and continue inductions through Selective Service. Mr. Flemming in turn selected as chairman of *his* study group Lawrence A. Appley, president of the American Management Association.

The Appley Committee found that, as a result of the Universal Military Training and Service Act and the Armed Forces Reserve Act of 1952, the number of Reservists in the country was increasing at a rapid rate. The committee saw here a potential conflict between military and civilian manpower needs, since those with essential civilian skills might be called to active duty by the military, thus upsetting the delicate balance that must be maintained.

So the Appley Committee proposed a "suitable" reserve of men, of a strength level to be determined by the President in consultation with the National Security Council, available for instant call as units or as individuals. These units and individuals which the Appley group termed an "Immediately Callable Reserve" rather than "Ready Reserve" should be maintained, the committee advised, "in a high state of training for military service."

Mr. Flemming passed the Appley report on to the President with a recommendation that:

"Pending a determination of the size, composition and training of our Reserve forces, we hold in abeyance any decision on the recommendations to put into effect the Universal Military Training provisions of the Universal Military Training and Service Act."

ConAC's Lt. Gen. Leon W. Johnson.

The reference to the Universal Military Training provisions applied to the ground that General Adler's group had reconnoitered before proposing that steps be taken to get on with the six-months' training requirement.

Mr. Flemming also proposed that the National Security Council, on the basis of recommendations by the Department of Defense, "determine the size and composition of military reserve forces needed in the light of current and future national security requirements."

The ODM director made two other proposals relative to the issue. He suggested:

1. That the Department of Defense prepare for the consideration of the National Security Council a program for the establishment of an "Immediately Callable Reserve" and of a "Selectively Callable Reserve," each of appropriate size and composition; and

2. That the Department of Defense prepare for the consideration of the National Security Council a training program for the "Immediately Callable Reserve."

Maj. Gen. William E. Hall heads AF Reserve activities in the Pentagon.

The White House liked Mr. Flemming's proposals and sent them over to the Pentagon where the Defense Department organized a task force to come up with answers by April 1. Maj. Gen. William E. Hall, who heads Air Force Reserve activities in the Pentagon, was named to represent his service. Appointed to serve with him were Maj. Gen. W. W. Wensinger, Marine Corps; Rear Adm. K. M. McManes, Navy; Brig. Gen. R. Van Brunt, Army; and Rear Adm. J. K. Hirshfield, of the Coast Guard.

The President directed that the fruits of the deliberations of this task force be returned to the White House for consideration by himself and the National Security Council. After the President and the Security Council have had their look at the program, they will pass it, with their recommendations, along to Capitol Hill for the stamp of approval by Congress, whose keen interest in the Reserve is a matter of record.

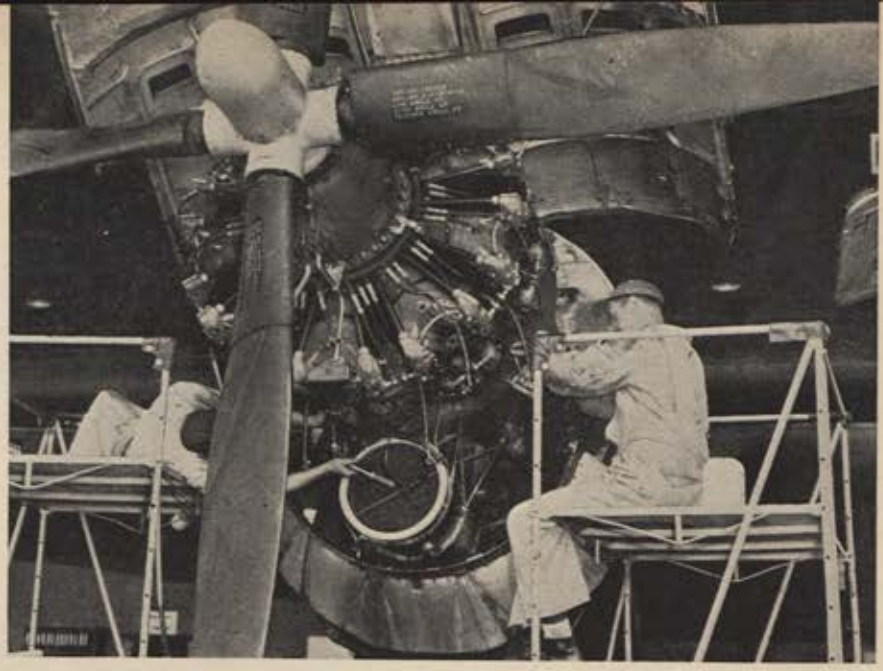
Only last January a subcommittee of the Senate Armed Services Committee concluded its own examination of the nation's Reserve program with the observation that, although the state of readiness of the Air Force Reserve is relatively high because of the experience Reservists gained in Korea, the program is not all it could be.

And just before the Senate subcommittee's report was made public, the Pentagon's Reserve Forces Policy Board—principal Reserve policy advisor to the Secretary of Defense—produced its recommendations for changes needed to develop "more realistic Reserve programs."

(Continued on following page)

Korea showed how badly the Reserve program was being run, but despite this, AF recallees played a vital part in operations all around the world.

RESERVE——CONTINUED



How to keep current on aircraft maintenance is a big problem for Reservists.

Under terms of the Armed Forces Act of 1952, the present Reserve organization is divided into two basic segments—Ready and Standby. The Ready Reserve consists of units and individuals who can be tapped for immediate active duty in a national emergency. The Standby consists of those units and individuals who can be called only in time of war or in a national emergency declared by Congress.

The Adler Committee suggested that the Ready Reserve "should have enough men in units to enable them to operate effectively." It should be composed, too, the committee said, of "individuals not in units receiving sufficient periodic training to maintain their skills."

Appley's ODM group suggested the "Immediately Callable Reserve" "receive training of such a character that our armed forces will be assured of support by highly trained reserves in a state of readiness to enter effectively upon active duty."

The Adler Committee made no mention of the Standby Reserve. The Appley group proposed it be eliminated in favor of a "Selectively Callable Reserve." Individuals in this category would be called to active duty through the Selective Service System.

The best way to mobilize when, to borrow a Pentagon cliche, "the balloon goes up," also occupied the attention of the Adler group, the Appley people, and the Reserve Forces Policy Board.

The Armed Forces Reserve Act requires Air Force to "maintain adequate and current personnel records," which indicate civilian occupational skills, dependency status, and any other data the Secretary of the Air Force prescribes. But the determination of whether the Reservist is needed more in the Air Force than in the civilian economy is left to the military.

Both the Adler and Appley Committees felt that this authority should be somewhat curtailed. The Adler group proposed that, before another emergency, Reservists should be screened and classified according to their value to the civilian economy. Reservists found to be more valuable to civil life then would pass to the jurisdiction of Selective Service.

This thinking generally agreed with the Appley report which said that the Selective Service System "appears best suited" to handle selective recall based upon individual factors such as occupation.

The Reserve Forces Policy Board took the same line. "On the basis," said RFPB, "that only a part of the proposed Standby Reserve would be needed to fulfill mobilization requirements, a determination would be required of the effect of mobilization of each individual on essential civilian and industrial needs as compared with military requirements, in order to decide which indivduals should be called." RFPB, too, saw Selective Service as the proper agency to bring the Standby Reservists to active duty in ranks and specialties requested by the Defense Department. To simplify administrative details, RFPB suggested that Selective Service keep the records of Standby Reservists with a single amendment to this fixed rule. Air Force would keep duplicate records of officers in the Standby Reserve.

The Adler group took a strong stand against compulsory unit train-

(Continued on page 67)

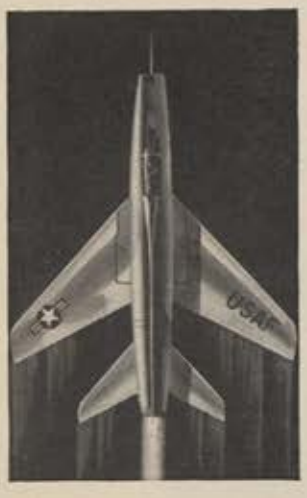
Lack of planes for training purposes is another problem for the AF Reserve.

NORTH AMERICAN HAS BUILT MORE AIRPLANES THAN ANY OTHER COMPANY IN THE WORLD

MACH

BUSTER!

First of the true tri-sonic fighters, the new F-100 Super Sabre exceeds Mach 1 in normal, level flight... flying faster than the speed of sound.



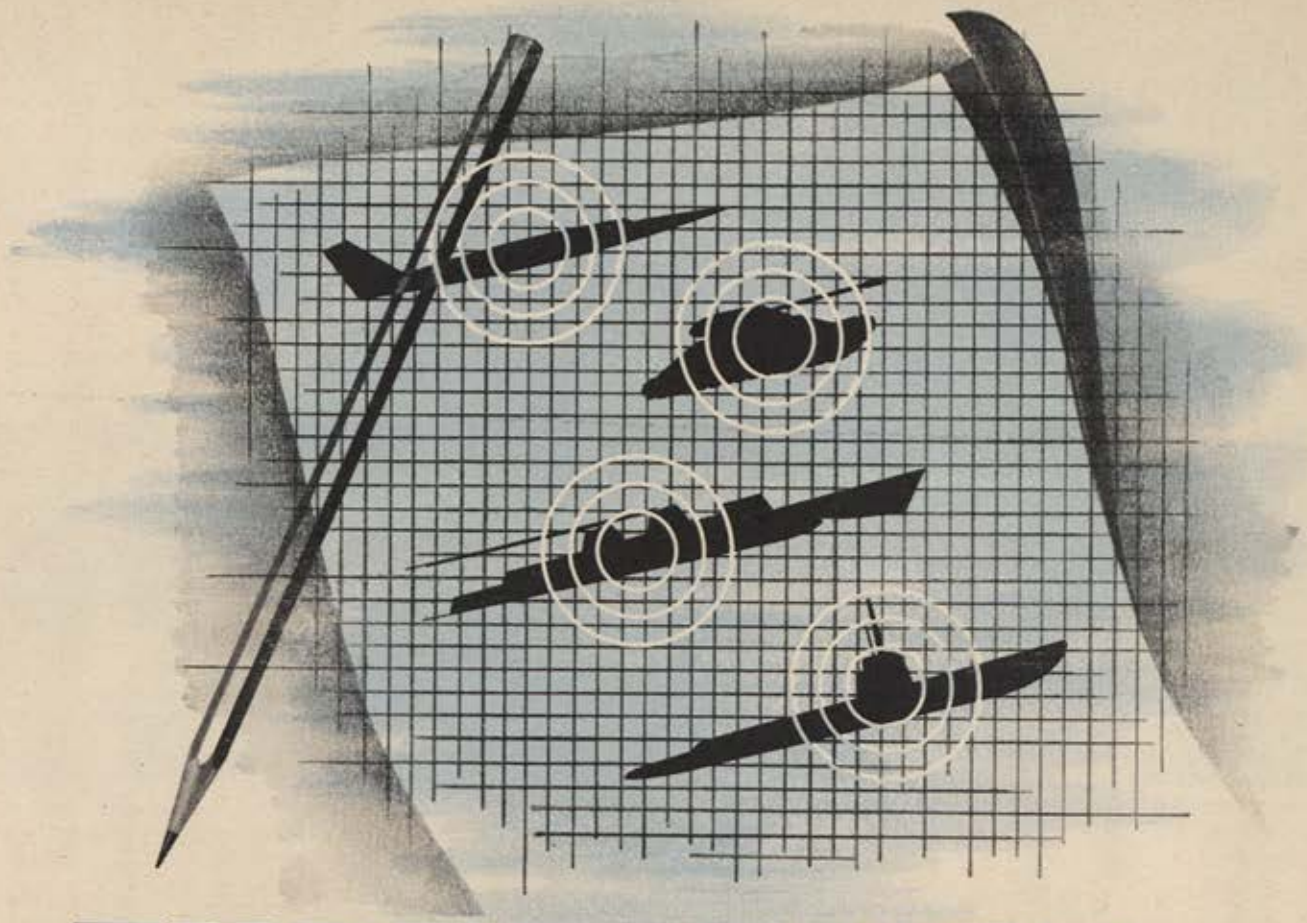
MACH (pronounced "mock") is a term you'll be seeing more and more since it is the only really accurate way of evaluating jet plane speeds. The need for this special standard of measurement is due to the fact that the speed of sound varies with changes in temperature and altitude. At sea level, for instance, sound travels at speeds ranging from 735 MPH at an air temperature of 60° to 800 MPH at 100°. However, using the Mach numbers, a jet traveling at Mach 1 is flying at the speed of sound, no matter at what altitude or temperature. Far advanced beyond any fighter now in production, the F-100 Super Sabre was designed and built by North American to meet our nation's need.

Engineers of vision... men who appreciate a challenge, are wanted at North American. If you are an engineer looking to the future, write North American, Los Angeles 45, California.

Organization, Facilities and Experience Keep

North American Aviation, Inc.

Years Ahead in aircraft... guided missiles... electronics... atomic energy... research and development



EXPERIENCE...

When it comes to electronics . . . experience is our single greatest virtue.

The average experience of our electronic engineers is more than ten years in this specialized field.

Their contributions to this fast-developing industry are attested to by our producing acoustical-electronic firing error indicators . . . portable, high-powered, 1kw-plus long-range transmitters . . . and one-man, multi-channel UHF transceivers. If you have a problem which may be solved by the use of electro-mechanical, hydraulic, pneumatic or electronic equipment, let's talk it over.

"WE DISTRIBUTE A WIDE RANGE OF AIRCRAFT EQUIPMENT FOR A NUMBER OF AMERICA'S LEADING MANUFACTURERS. A NEARBY BRANCH WILL BE HAPPY TO SERVE YOUR NEEDS. DO MORE BUSINESS . . . REALIZE MORE PROFIT WITH AIR ASSOCIATES' EQUIPMENT."

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AIR ASSOCIATES, INC.

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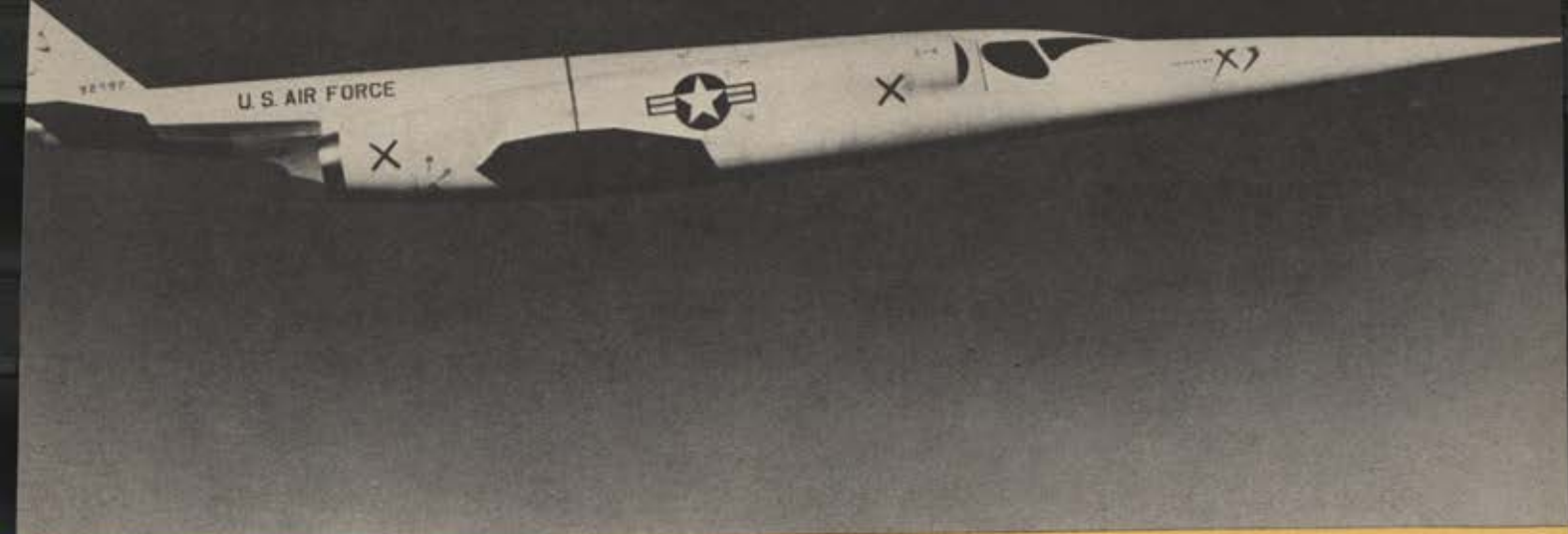


The "Flying Stiletto," Douglas X-3 research aircraft.

TOP DEVELOPMENTS OF 1953

The swift pace of the technological struggle as outlined by the Air Research and Development Command

By Lt. Gen. Donald L. Putt

As condensed from a speech at Harrisburg, before the Engineers Society of Pennsylvania.

DURING the past year, the Air Research and Development Command and its collaborating organizations continued to make significant progress in the development of the advanced air weapons which must meet the specific requirements of the four basic missions of the Air Force—Air Defense, Strategic Air, Tactical Air, and Air Transport.

ARDC Headquarters in Baltimore, Md., maintains close contact with Air Force Headquarters in Washington and with the major air commands to insure that USAF materiel and techniques are a practical blend of field requirements and advanced technology and that the ARDC continuously reflects current and planned mission requirements.

In pursuing this program, ARDC works closely with industry and educational organizations, and collaborates with many governmental agencies, including the National Advisory Committee for Aeronautics, the Navy Bureau of Aeronautics, and the technical services of the Army.

With this background I now should like to give you an over-all picture—within the limits of military security—of what we have accomplished during the past year.

The swift pace of the technological struggle was evidenced in the test flights of two supersonic combat aircraft prototypes—the **North American** F-100 and the **Consolidated Vultee** F-102. The shape of the future was revealed in the flight of the **Bell** X-1A research airplane at more than twice the speed of sound.

Among other important developments in the field of military aircraft were the following:

- RB-36D—F-84 (**Convair** and **Republic**)—In extensive flight tests, a "parasite" F-84 was repeatedly released and retrieved by a "mother" RB-36D while in flight.
- B-47 (**Boeing**)—The role of aerial refueling in extending strategic operational range was emphasized in the 12,025-mile, non-stop flight of a B-47.
- Jet-powered tanker (**Boeing**)—Two B-47s, one modified for service as a tanker, tested on high-speed, high-altitude refueling techniques. An adaptation of the "probe-and-drogue" refueling system, developed by **Flight Refueling, Inc.**, was employed.
- RB-47E (**Boeing**)—The photo-reconnaissance version of the Strato-

(Continued on following page)

DEVELOPMENTS—CONTINUED

jet, equipped with an air-conditioned camera compartment.

- B-52 (**Boeing**)—Additional flight test hours were logged on this long-range, heavy bomber. In production, the B-52 is powered by eight **Pratt & Whitney** J-57 engines.
- B-57A (**Martin**)—The twin-jet B-57A night intruder was placed in production. A USAF-modified version of the British **Canberra**, the B-57A uses two J-65 **Wright** engines.
- F-86H (**North American**)—The F-86H is designed to operate as a fighter-bomber as well as a day-fighter. In the 650-mph class, the new model has a combat radius of more than 600 miles and a service ceiling exceeding 45,000 feet. It is powered by **General Electric's** J-73.
- The **North American** F-100 started test flights. The fighter is powered by a **Pratt & Whitney** J-57 turbojet and is in production.
- Maiden flight of the **Convair** F-102 was made. Powered by the J-57, the delta-wing interceptor incorporates improved electronic and armament systems.

Three contracts were awarded for the development of new aircraft—to **Republic Aviation Corporation** for the development of a delta-wing research airplane designated the XF-103, to the **Lockheed Aircraft Corporation** for the development of the F-104, a day fighter, and to **Republic** for the development of the F-105, a fighter-bomber which will use the **Allison** J-71 turbojet engine.

- C-123B (**Chase**)—This medium transport is being produced by **Fairchild.** The high-wing transport is powered by two **Pratt & Whitney** R-2800 engines.
- YC-130 (**Lockheed**)—Development continued on this high-wing, long-range cargo and troop transport powered by four **Allison** turboprop engines. First flight is expected early in 1954.
- YH-16 (**Piasecki**)—One of the largest known helicopters designed for operational use, the YH-16 completed its first flight in 1953. It is powered by two **Pratt & Whitney** R-2180 engines.
- T-34A (**Beech**)—The first production model of a T-34A Mentor primary trainer was delivered. It is powered by a 225-hp **Continental** O-470A six-cylinder engine.
- X-1A (**Bell**)—This special research airplane was flown at more than twice the speed of sound by Maj. Charles Yeager.
- X-3 (**Douglas**)—The X-3 was part of a study directed toward the

development of a design capable of unusually high speeds and altitude ceilings. Popularly named the "Flying Stiletto," it has a slender fuselage and extremely long, tapered nose and short wings.

- X-5 (**Bell**)—The first aircraft to feature variable sweep-back wings, the X-5 was also the first of the nation's modern research airplanes to make a cross-country flight.
- Q-2 Drone (**Ryan**)—The "Firebee," an all-metal pilotless target aircraft developed for use in air-to-air gunnery training, was publicly demonstrated.
- QF-80 (**Lockheed**)—These pilotless versions of the F-80 are remotely controlled from the ground and air by means of a robot system designed and produced by the **Sperry Gyroscope Company.**

The development and testing of guided missiles continued during the year with emphasis on increasing the accuracy and reliability of guidance and control systems.

In the field of propulsion the year's research and development program was concentrated on the improvement of existing engines and on the development of new power plants in four principal classifications—turbojet, turboprop, rocket, and ramjet.

As for turbojets, the USAF could announce officially that the **Pratt & Whitney** J-57 engine was in the 10,000-pound thrust class. In quantity production, the J-57 powers the B-52, F-100, and the F-102. The J-57 has a low specific fuel consumption and a rapid rate of acceleration.

"Ficon" project combines the capabilities of the F-84 with those of the B-36.

The J-71, a new engine with an improved thrust rating was delivered to the Air Force by the **Allison Division of General Motors.**

Flight tests were continued on the **General Electric** J-73 turbojet. The engine powers the F-86H.

In the field of turbopropellers, an extensive test program was initiated by ARDC. Contracts were awarded to have seven transport aircraft equipped with turboprop engines for use as service test airplanes.

The rocket development effort was aimed at the continued application of rocket propulsion to aircraft and guided missiles.

The Blue Bonnet Ordnance Plant at McGregor, Texas, was activated as an Air Force solid propellant rocket facility. The **Philips Petroleum Company** operates the new plant.

Development continued on ramjets for use in guided missiles, and on the application of nuclear energy to the propulsion of aircraft.

The first flight of the XF-88B as a flying test bed for supersonic-type propellers was made on April 14. In addition to two J-34 **Westinghouse** turbojet engines, the XF-88B is equipped with an XT-38 **Allison** turboprop engine.

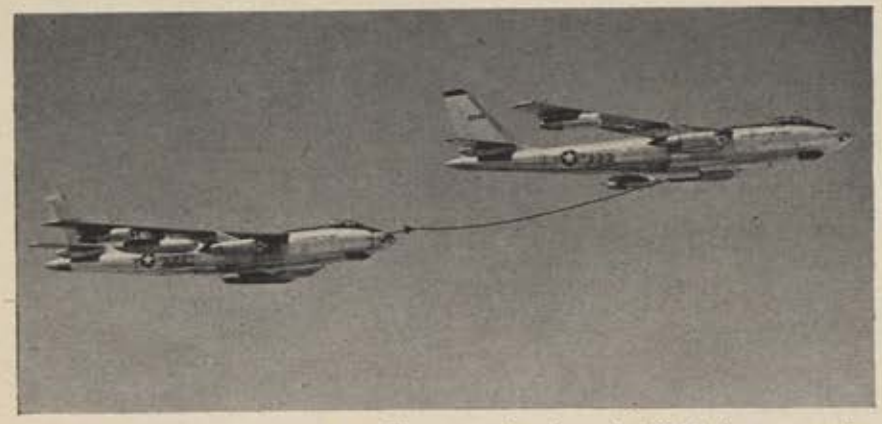
In the field of fuels and lubricants, an important contribution to the reduction of coking in combustion chambers of turbine engines was made by WADC.

The rapid advances in aircraft performance and the specialized USAF mission requirements for automatic and all-weather flight operations greatly expanded the role of electronics during 1953.

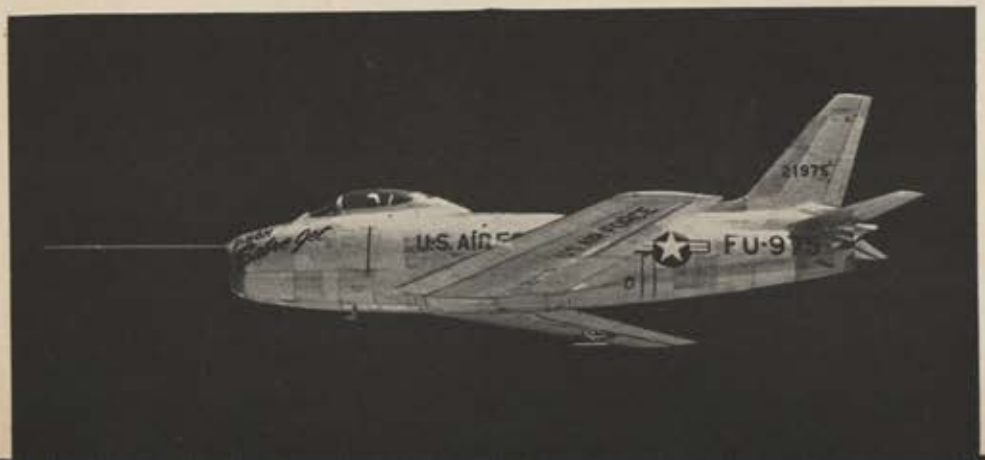
The wide range of the electronics program is evidenced in the following examples:

An automatic computation and control system for air traffic control was developed by the Air Force Cam-

(Continued on page 43)



Jet-to-jet refueling became a reality, transforming the B-47 into a tanker.



F-86H (left), a dual-mission plane.

ONLY GILFILLAN HAS PROVEN GAP-FILLER RADAR NOW

IF HOURS WERE MILES

During the entire year of 1953, Gilfillan Surveillance Radar was "on guard" 24 hours a day—8750 hours—at Boston International Airport with only 7⅓ hours of involuntary outage. This is less than 1/10 of 1%! If hours were miles, this would be the equivalent of the short distance from Boston Commons to Boston Airport compared to the vast stretch of air miles lying between Los Angeles, Boston and Moscow.

This example is only one of the many instances of the remarkable 4-year dependability record of *perfected* Gilfillan Surveillance Radar when combined with *outstanding* maintenance by CAA personnel at major U. S. airports.

Reliable air defense requires reliable radar. Gilfillan is the *only* gap-filler radar now available that has already made the long jump from prototype to *proven performance.*

Gilfillan has *developed* and *delivered* more ground surveillance radar than all other manufacturers. The proven dependability of this perfected equipment is *now* demonstrating itself—at this moment and 24 hours every day—at more than 200 air bases and airports around the world.

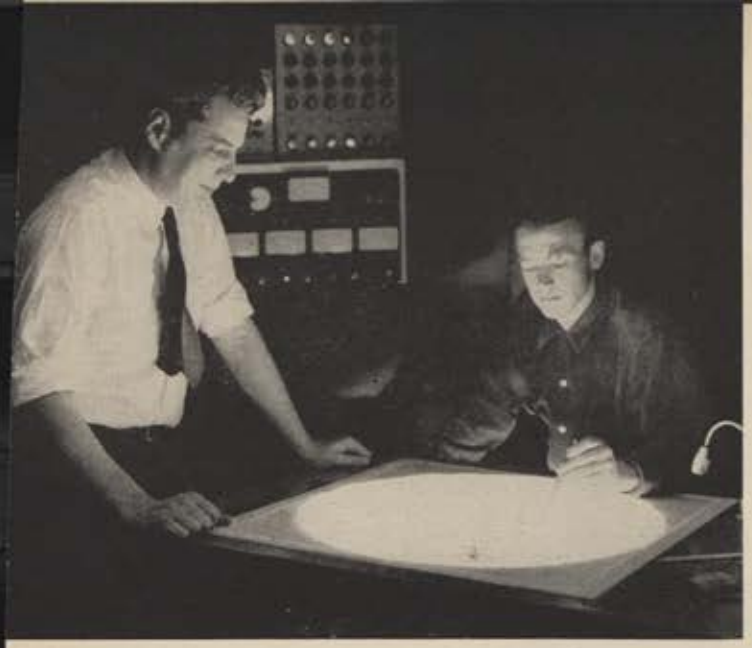
GCA RADAR AND ELECTRONICS

Gilfillan

LOS ANGELES

GCA

AROUND THE WORLD



Volscan, ARDC's new automatic air traffic control system, can bring in one aircraft to land every thirty seconds.

TOP DEVELOPMENTS OF 1953 — CONTINUED

bridge Research Center (AFCRC). The system is able to sustain a 120-aircraft-per-hour landing rate—one aircraft every thirty seconds!

The first experimental units of a line of radar stations in the Arctic regions were established. The installation work is being done by the **Western Electric Company.**

Another aid to air defense was the development of the RC-121C aircraft, a reconnaissance version of **Lockheed's** Super Constellation, as a flying radar station.

A step toward completely automatic flight was the development of the "Automatic Sequence Selector." This device is designed to tape-record pre-selected flight plans and feed them to an aircraft's autopilot and airspeed controls. **Minneapolis Honeywell Regulator Company** worked with WADC on this development.

An improved dead-reckoning computer, the A-1, was developed by the **Ford Instrument Company** with WADC. The device continuously calculates and indicates aircraft position.

An added capability was given Ground Control Approach (GCA), through the development by Rome Air Development Center of a large turntable on which a single GCA radar can be rotated to cover bad weather landing approaches from either runway direction.

A liquid-cooled miniaturized transmitting tube, utilizing ceramic instead of glass, was produced.

Dual triodes with separate cathodes, and subminiature voltage amplifier tubes with small heater power were developed by WADC and **National Union Radio Corporation** for use in packaged assemblies and multi-tube equipment.

Progress was made in the development of small electron tubes capable of operating at high temperatures in hermetically sealed, expendable assemblies or sub-assemblies. **Sylvania Electric Products** and **Raytheon Manufacturing Company** are working with WADC.

A machine system for accepting, storing, and searching for engineering data on electronic components was developed through an ARDC-sponsored research program at **Batelle Memorial Institute.**

In the field of aircraft equipment, a new method to parachute heavy equipment was devised for the C-124. Utilizing a pre-loaded pallet system, the aircraft crew can drop a total of 40,000 pounds within a few seconds. The system was conceived and tested by WADC and the **Douglas Aircraft Company.**

A new type of platform on which to load equipment for aerial drops was tested. The platform features an air bag which absorbs some of the landing shock.

A new method for tying down cargo was developed to permit automatic release of the tie-downs when the extraction parachute inflates.

Flight simulators were developed to provide more efficient, safer, and economical training of pilots and crews.

One of these was the F-89D Flight Simulator whose duplication capabilities include radar fire control. It was produced by the **Link Aviation Company,** working with WADC.

A fixed-gunnery trainer (F-151) was developed to duplicate actual conditions of a gunnery mission. The **Rheem Manufacturing Company** worked with WADC.

In the field of aircraft electrical power generation and regulation, efforts were concentrated on developing simple, dependable, and easily maintained equipment. One result was the development of a single, lightweight Direct Current Generator Control Panel (B-3) to replace five previously used controls scattered throughout the aircraft. **Jack & Heintz, Inc.,** and the **Westinghouse Electric Corporation** worked with WADC.

Prototypes of miniature engine-generator sets were developed for ARDC by the **Ruckstell-Hayward Engine Company** to meet the limited weight and space requirements for beacon power supplies and emergency electrical power units of 50 to 100 watts continuous output.

Development was completed on an air expansion turbine for aircraft cabin cooling by the **Stratos Division** of **Fairchild Engine and Airplane Corporation** cooperating with WADC.

A device was developed to signal a pilot through his headseat if the aircraft's landing gear is not down and locked when the throttle is set below minimum speed. The circuit was designed by WADC and submitted to industry for development.

The development of the C-2A True Airspeed and Mach Number Computer provided a single, centralized unit to meet the separate requirements of airborne armament, photographic, meteorological, navigational and indicating systems for true airspeed and Mach number data. The computer was developed by the **Kollsman Instrument Corporation** in conjunction with WADC.

Progress was also made in the development of new and improved equipment and techniques for aerial photographic reconnaissance.

The Universal Camera Control System, an electronic control device which automatically and simultaneously controls the operation of all aerial cameras in a reconnaissance aircraft reached its final stages of development.

An entirely new type of camera mount was developed in conjunction with **Aeroflex Laboratories, Inc.** The mount moves the camera by windings similar to those of an electrical motor field.

A new five-unit radar camera system with interchangeable parts was developed by the **Bolsey Corporation of America** for ARDC.

Tests were continued on a closed-circuit television system which can instantaneously convert aerial film negatives to positive images and display them on a television screen. The system, called a "Reconoscope," was developed for ARDC by the **Columbia Broadcasting System.**

(Continued on page 49)

ARDC Reorganizes

Command is streamlined

AIR Research and Development Command Headquarters, Baltimore, Md., has been reorganized and streamlined (see chart, page 46) in a pattern more closely allied to that of an industrial organization, although retaining traditional military titles and terms.

According to Lt. Gen. Donald L. Putt, ARDC Commander, the new set-up will:

- Clarify responsibility and authority.
- Fix accountability.
- Make, in general, for more rapid, efficient, and economical management.

Perhaps the major specific result of the new headquarters organization is the gradual shifting of early weapons system planning to Baltimore from subordinate ARDC Centers. Now, all procurement of design studies and development will be done in Baltimore, rather than at Wright Air Development Center at Wright-Patterson AFB, Ohio.

Another major collateral advantage, ARDC planners believe, is the plan whereby a system project officer and a limited number of key personnel will follow a given weapons system from the planning stage, through development, and into full-scale production. Continuity in planning, development, and production is thus ensured, since the same AF people will be working with their opposite numbers in industry throughout the cycle.

The new organization provides for a Deputy Commander for Technical Operations and a Deputy Commander for Support Operations, each reporting directly to General Putt. Each deputy commander's staff will include subordinate directorates, four in the case of Technical Operations, six for Support Operations (see chart).

Also reporting directly to the commander are Plans and Policies Office, Assistant for Operational Readiness, Atomic Energy Office, and Executive Officer. The Office of Scientific Research and the Special Staff are unchanged.

Contrary to published reports, the reorganization has no connection with a possible shift of ARDC Headquarters to a projected new building at Andrews AFB, Washington, D. C. The latter, if it occurs, will not take place for a matter of years.—END

Arctic Sentinels

Thousands of miles away, long-range Northrop F-89 Scorpions stand guard night and day along the top-of-the-world route to America's heart, defending our homes and industry • These lethal USAF defenders will "scramble" at the first flash-warning from the polar radar chain. With deadly armament, latest radar, and ability to range over a defense zone up to 2000 miles in depth, they can strike, follow, harass, and destroy an invader hours before he can reach target • The Scorpion F-89 is America's most heavily armed fighter. It is a product of the precision team of Northrop men and machines.

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Pioneer Builders of Night and All Weather Fighters

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1

Commander
BALTIMORE, MD.
Lt. Gen. Donald L. Putt

2

Vice Commander
BALTIMORE, MD.
Maj. Gen. James McCormack, Jr.

3

Plans and Policies Office
BALTIMORE, MD.
Col. Brooks A. Lawhon

4

Ass't for Operational Readiness
BALTIMORE, MD.
Col. Joseph R. Holzapple

5

Atomic Energy Office
BALTIMORE, MD.
Col. William N. D'Ettore

6

Executive Office
BALTIMORE, MD.
Lt. Col. Robert G. Moll

7

Chaplain
BALTIMORE, MD.
Col. John J. Wood

8

Information Services
BALTIMORE, MD.
Col. Leon Booth

9

Staff Judge Advocate
BALTIMORE, MD.
Col. Leroy G. Cooper

10

Inspector General
BALTIMORE, MD.
Col. Franklin K. Fagan

11

Adjutant
BALTIMORE, MD.
Col. Raymond C. Lewis

12

Surgeon
BALTIMORE, MD.
Col. Frederick C. Kelly

13

Deputy Commander, Technical Operations
BALTIMORE, MD.
Brig. Gen. Floyd B. Wood

14

Deputy Commander, Support Operations
BALTIMORE, MD.
Brig. Gen. Kurt M. Landon

15

Guided Missile Office
BALTIMORE, MD.
Col. Harry J. Halberstadt

16

Programming Office
BALTIMORE, MD.
Lt. Col. William J. Thomas

17

Comptroller
BALTIMORE, MD.
Col. Milton E. Godfrey

18

Directorate of Personnel
BALTIMORE, MD.
Col. Neal E. Guy

19

Directorate of Research
BALTIMORE, MD.
Col. Don Flickinger

20

Directorate of Development
BALTIMORE, MD.
Brig. Gen. Leighton I. Davis

21

Directorate of Installations
BALTIMORE, MD.
Col. DeWolfe H. Miller

22

Directorate of Procurement
BALTIMORE, MD.
Col. John R. Martin

23

Directorate of Weapon Systems
BALTIMORE, MD.
Col. Ernest N. Ljunggren

24

Directorate of Operations
BALTIMORE, MD.
Col. Fred W. Miller

25

Directorate of Maintenance, Supply, and Communications
BALTIMORE, MD.
Col. James A. McKerly

26

Directorate of Manpower and Organization
BALTIMORE, MD.
Col. Ernest R. Manierre

An *AIR FORCE* Magazine Chart
(Corrected as of March 8, 1954)

27 
Commander, Arnold Engineering Development Center
TULLAHOMA, TENN.
Brig. Gen. Samuel R. Harris

28 
Chief of Staff
TULLAHOMA, TENN.
Col. Francis H. Richardson

29 
Deputy for Operations
TULLAHOMA, TENN.
Mr. Donald R. Eastman

30 
Deputy for Materiel
TULLAHOMA, TENN.
Col. Stanley den Herder

31 
Deputy for Comptroller
TULLAHOMA, TENN.
Col. Edward R. Casey

32 
Staff Judge Advocate
TULLAHOMA, TENN.
Lt. Col. Elmer P. Fizer

33 
Commander, AF Cambridge Research Center
CAMBRIDGE, MASS.
Maj. Gen. Raymond C. Maude

34 
Deputy Commander
CAMBRIDGE, MASS.
Col. Michael J. Ingelido

35 
Deputy for Plans and Operations
CAMBRIDGE, MASS.
Col. William C. Adams

36 
Deputy for Materiel
CAMBRIDGE, MASS.
Col. Richard H. Curtis

37 
Deputy for Personnel
CAMBRIDGE, MASS.
Col. Newton M. Richard, Jr.

38 
Deputy for Comptroller
CAMBRIDGE, MASS.
Lt. Col. Samuel P. Faber

39 
Directorate of Geophysics Research
CAMBRIDGE, MASS.
Dr. Helmut Landsberg

40 
Directorate of Atomic Warfare
CAMBRIDGE, MASS.
Col. Jean A. Jack

41 
Directorate of Electronics Research
CAMBRIDGE, MASS.
Mr. John W. Marchetti

42 
Commander, AF Missile Test Center
PATRICK AFB, FLA.
Maj. Gen. William L. Richardson

43 
Vice Commander
PATRICK AFB, FLA.
Col. John K. Brown, Jr.

44 
6541st Guided Missile Wing
PATRICK AFB, FLA.
Col. Harold W. Norton

45 
Deputy for Operations
PATRICK AFB, FLA.
Col. Harry J. Sands, Jr.

46 
Deputy for Materiel
PATRICK AFB, FLA.
Col. Joseph B. Williams

47 
Deputy for Personnel
PATRICK AFB, FLA.
Col. Arnold L. Smith

48 
Deputy for Comptroller
PATRICK AFB, FLA.
Col. John W. O'Neill

49 
Maintenance and Supply
PATRICK AFB, FLA.
Lt. Col. Alexander T. McSwain

50 
Commander, AF Special Weapons Center
KIRTLAND AFB, N. M.
Maj. Gen. John S. Mills

51 
Vice Commander
KIRTLAND AFB, N. M.
Col. Daniel E. Hooks

52 
Chief of Staff
KIRTLAND AFB, N. M.
Col. Jay D. Rutledge, Jr.

53 
Commander, 4901st Support Wing
KIRTLAND AFB, N. M.
Col. Henry G. Hamby, Jr.

54 
Commander, 4925th Test Group
KIRTLAND AFB, N. M.
Col. Harry L. Donicht

55 
Commander, 4930th Test Support Group
EDWERTOR, M. I.
Col. James F. Starkey

56 
Commander
INDIAN SPRINGS AFB, NEV.
Lt. Col. O'Neal J. T. Archer

57 
Commander, Holloman Air Development Center
HOLLOMAN AFB, N. M.
Col. Don R. Ostrander

58 
Deputy Commander (acting)
HOLLOMAN AFB, N. M.
Col. Otto R. Haney

59 
Commander, 6580th Test Support Wing
HOLLOMAN AFB, N. M.
Col. Frank D. Sharp

60 
Deputy for Operations
HOLLOMAN AFB, N. M.
Col. Clarence L. Elder

61 
Deputy for Materiel
HOLLOMAN AFB, N. M.
Col. Alexander D. McEwen

62 
Deputy for Comptroller
HOLLOMAN AFB, N. M.
Maj. Urey E. Chandler

63 
Deputy for Personnel
HOLLOMAN AFB, N. M.
Maj. William A. Chaffee

64 
Commander, AF Personnel and Training Research Center
LACKLAND AFB, TEX.
Col. Herbert N. Cowles

65 
Technical Director
LACKLAND AFB, TEX.
Dr. Arthur W. Melton

66 
Deputy for Support Services
LACKLAND AFB, TEX.
Lt. Col. John P. Jones

67 
Deputy for Research and Development
LACKLAND AFB, TEX.
Dr. Charles W. Bray

68 
Deputy for Materiel
LACKLAND AFB, TEX.
Maj. Harry Z. Moore

69 
Deputy for Personnel
LACKLAND AFB, TEX.
Maj. Lawrence W. Bowen

70 
Deputy for Comptroller
LACKLAND AFB, TEX.
Lt. Col. Leo M. Burbridge

71 
Commander, Rome Air Development Center
GRIFFISS AFB, N. Y.
Brig. Gen. Daniel C. Doubleday

72 
Vice Commander
GRIFFISS AFB, N. Y.
Col. Franklin K. Paul

73 
Deputy for Operations
GRIFFISS AFB, N. Y.
Col. Leonard N. Palmer

74 
Deputy for Development
GRIFFISS AFB, N. Y.
Col. William S. Heavner

75 
Deputy for Materiel
GRIFFISS AFB, N. Y.
Lt. Col. Oscar E. Austin

76 
Deputy for Personnel
GRIFFISS AFB, N. Y.
Col. Frederick W. Searles

77 
Deputy for Comptroller
GRIFFISS AFB, N. Y.
Col. Alden C. Reynolds

78 
Commander, Wright Air Development Center
WRIGHT-PATTERSON AFB, OHIO
Maj. Gen. Albert Boyd

79 
Vice Commander
WRIGHT-PATTERSON AFB, OHIO
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DEVELOPMENTS—CONTINUED

A new rocket and bomb strike camera (P-2) was flight tested. It can take six aerial photos per second on 70mm film at shutter speeds as high as 1/2,000 of a second.

Investigation continued on all aspects of the human factor involved in high-altitude, high-speed, and long-range flight.

Another step toward completely automatic ejection was a cartridge-actuated, automatic-opening lap belt, developed in collaboration with the **Stanley Aviation Corporation.**

A pneumatic anti-G suit was standardized to replace the present standard USAF type G-4B and USN type Z-2 anti-G suits. The T-1 partial pressure suit and K-1 helmet also neared standardization.

In the field of materials, metallurgical studies continued to be directed toward the development of alloys and coatings with increasingly greater heat resistance. Extensive laboratory study and experimentation were also pursued to explore every possibility of utilizing new raw materials and obtaining interchangeable and substitute materials for those in the scarce category. Much effort during the year was expended to create textiles of increased strength and to develop new materials for primary aircraft structural components.

The ARDC research program continued its probe into scientific problems. The important scientific discoveries made will be utilized to extend the capabilities of present air weapons and to conceive the new weapon systems needed in the future. The ARDC program was accomplished principally through sponsorship of research projects at universities, colleges, and civilian research foundations.

This is a partial story of what the Air Force has done during the past year in its effort to "produce more and better weapon systems at less cost." For obvious reasons, many of the most striking and interesting new developments cannot be discussed publicly.

But there are a number of encouraging conclusions. For instance, our close cooperation with science and industry is not merely a phrase but an accomplished fact. Further, Army, Navy, and the Air Force are joining forces wherever their interest and goals are common. Finally, we are leaving no stone unturned to find new and better and cheaper means of preparing ourselves for any contingency that may arise, in the immediate or more distant future.—END

JET BLASTS

SPECTRE OF A SWORD

Will outdated pageantry improve service morale?

The Navy has recently announced the reintroduction of swords for use by officers on ceremonial occasions, "to restore a certain prestige to the officer rank." Following by no more than a year the return by the Marines to the swagger stick for similar reasons, this presages a humorous trend. Can we expect that the Army will return to Sam Browne belts and sabres (once necessary in combat), and that the Air Force will again appear in breeches and English riding boots (once a vital safety measure to avoid fouling cockpit control cables)?

In a more serious vein, however, why is it necessary at this time to restore this kind of prestige in the officer rank?

After World War II, the Doolittle Committee made extensive investigations which resulted in a program of democratization in the Armed Forces. In the Army, the Air Force, and the Marines the uniforms of officers and enlisted personnel were standardized to be truly uniform; provisions were made for enlisted people to sit on courts martial; saluting off military reservations was eliminated; and emphasis was placed on providing equal facilities for officers and for enlisted personnel. Is the current trend a complete change of direction from those postwar days when millions of our citizens knew the Armed Forces so intimately, and were so disturbed at the lines of demarcation between officer and enlisted personnel?

Perhaps this is a suggested answer to the morale problem which is besetting the services these days, manifested by trained officers wanting out and by a lack of applicants for flight training. However, this morale problem exists as well amongst the enlisted ranks, where it is not to be helped by providing officers with superficial aspects of prestige and rank.

If the purpose of this return to outmoded pageantry is to help officer morale and make the regular service more attractive (and what other purpose could motivate this action?), it seems that our policymakers are on the wrong tack. It is axiomatic that prestige results from respect, and respect from efficient performance of duty. High quality officer personnel will deliver that

LET'S HAVE YOUR JET BLAST

In "Jet Blasts" you can sound off on any subject you want. Each month we'll pick the letter or letters we feel will interest our readers most and pay $10 for each one printed. Please keep letters under 500 words.—The Editors.

efficient performance, and earn the desired respect and prestige. Such high quality personnel will not be attracted by swords and swagger sticks in the face of gradually diminishing "fringe benefits." Do away with an officer's wine mess, reduce medical service for his dependents, make exchange and commissary shopping less attractive to his wife, and the cumulative effect is a serious blow at his pocketbook. This continuing policy has the effect of driving from the service the high quality, prestige producing personnel.

Emphasis placed on making the service career more attractive from a material standpoint would go farther towards restoring prestige to our Armed Forces than the reintroduction of archaic trappings.

Capt. William G. Vorhaus, Jr., AF Res.
Glen Cove, N. Y.

Student Allotment

A large percentage of the student body at this college of aeronautical engineering are former members of the armed forces and receive training under the "Korean War" GI Bill. We have compared notes with students still receiving training under the World War II GI Bill and are forced to complain about the inequalities of the two Bills.

This particular college operates under an accelerated program. It is the only college of its kind in the United States and deals entirely with aviation; everything from air transportation, weather, maintenance engineering, aeronautical engineering, and flying. Because of its curriculum and excellent reputation, we have all elected to attend school here, although tuition is relatively high compared to most schools.

As a married student with two dependents, I receive $165 a month. From this I am expected to pay tuition, books, and contribute to the support of my family. However, the tuition fee is $350 a semester, which is fourteen weeks. For this period I receive approximately $500, leaving a balance of approximately $150, or a little better than $10 a week to live on. But I can't use this money for living expenses as it must be applied to the next semester's tuition. I am therefore forced to find a full-time job to cover my living expenses, which have already been cut to a bare minimum.

I assume you know the intense amount of study that college requires and that it is extremely difficult to study and work at a full-time job and still get a minimum amount of sleep. The conditions have affected grades considerably.

We are all grateful for the opportunity our country has given us and that is why we continue on under these conditions. We have noted that students going to state colleges pay only about one-third the amount we have to and that they have sufficient funds left over to meet other obligations. Consequently, we have reached a conclusion which we think is a fair one for all concerned.

(Continued on page 53)

New DOUGLAS DC-7 Uses New VICKERS® Variable Displacement Hydraulic Pumps

Cabin supercharger drives on the new Douglas DC-7 use the largest known variable delivery aircraft hydraulic pump . . . the new Vickers PV-3918. Like the DC-7, the PV-3918 is an outgrowth of previous successful designs.

This pump is a development from similar but smaller pumps used in the DC-6, DC-6A and DC-6B. The basic application was so successful it was adopted for the new DC-7. The new pump provides a 147% increase in flow capacity with only a 50% increase in weight. A special feature of the PV-3918 is an overspeed control which automatically limits the maximum pump delivery and accordingly provides another safety check on compressor impeller speed.

For further information about the numerous advantages of Vickers Variable Displacement Piston Type Pumps, ask for Bulletin A-5203.

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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

That is, we believe the amount of allotment received should be in proportion to the tuition required.

If perhaps the AFA can help us, we would indeed be very grateful. I personally know the influence it has and I have seen many new things come into being because of it. If there is any solution, I am sure the AFA will help.

Martin J. Barone, Jr.
East St. Louis, Ill.

Service Poll

It seems to be an accepted fact that many things need changing, and this assumption is backed up by the low reenlistment rate. Present national policy indicates that the Air Force is destined to become the most important of the services. Thus it becomes urgent that all of us work towards making it the finest and most efficient.

The sergeant is certain he knows what is wrong with the service. The general is just as positive. I have my own ideas. Perhaps we agree on certain points; but we prove nothing.

Would it be too democratic or unmilitary to have a private group conduct a questionnaire of all present members of the service, in which they asked each individual about his intentions of reenlistment? Then they should ask why he arrived at that decision. A careful and scientific evaluation of all the answers would, I'm sure, provide the Air Force with the real reasons for the low reenlistment rate. It would, if nothing else, provide a rather accurate estimate of future manpower needs. Publication of the results of such a survey, however embarrassing, should arouse public opinion to the point where remedial legislation would be enacted.

Pardon me for being utopian, but this appears to me to be a simple and inexpensive way to obtain some most important facts.

Wilton B. Hodges
Grand Isle, La.

Vanishing Pilot

It is my hope that in addition to the projects now under way by the Association, you may find time to explore the plight of the vanishing private pilot. When he is my age he will not be called upon to fly in defense of his country, even though he may fly every week for the pleasure of it. But, like me, he has noticed that fewer and fewer pilots can afford planes of their own. And we remember away back when every high school boy wanted to be a pilot. Today (I am active in Boy Scouts and Future Farmers organizations) I have yet to meet one high school boy who wants or expects to become a pilot.

Flying must again be made attractive

(Continued on following page)

to youth. Why are they interested in hot rods? Because they can now afford a jalopy and they expect to soon own a good car. Do you know any youth who soon expects to buy his own plane? Even if he could pay for flying lessons, there is no point in it because of the high cost of planes. And suppose a youngster does hope to get his training in the Air Force. Unless he goes into the Air Force as a career, his flying time is wasted as he can never hope to own a jet.

How should such a subject be approached? Let's make a survey of high schools to find out exactly what the youngsters think. With this information, a public service campaign should be commenced, informing the high school students of the importance of flying from the standpoint of national defense, the advantages of being a commercial pilot, and of being a private pilot.

Another committee could be formed in Washington to persuade Congress that some of the money being given to foreign nations for defense purposes might be better spent right in this country, to bring small planes and flight instruction to every community as part of an optional high school education.

This training should include ground school training, soaring, and flying. Gliders and glider kits should also be a part of the training, if only to keep up with the youth of Europe. Soaring and gliding competition between communities could be encouraged like football or baseball competition.

Each local unit of AFA could act as liaison agent between AFA and the high schools, keeping contact with and encouraging the youngsters on a personal level.

Upon receipt of their private pilot licenses, they are eligible to join the community flying club and fly the community planes at cost. Government guaranteed loans should make light planes easy to finance, and quantity production, stimuated in this manner, should bring down the initial cost.

Where does this idea differ from the Air Cadet and CAP program? This plan is based on the thesis that private flight must be the initial goal, available to everyone within the age brackets that the Air Force could use in the event of emergency. Under this plan, the Air Force could press into immediate service young private pilots to whom the skies are a friendly, familiar place.

A program such as the above would build up a backlog of pilots, actively engaged in flying during military age, that would do more to prevent the next war, than all the push buttons in the Pentagon.

The AFA is the perfect organization to breathe life back into the dodo bird known as the private pilot. The AFA can help prevent his becoming extinct as a species, and at the same time open up a vast, national storehouse of potential airmen.

Dean B. McNealy
St. Helena, Calif.

IT TAKES MANY MINDS TO MAKE AN "ELECTRONIC BRAIN"

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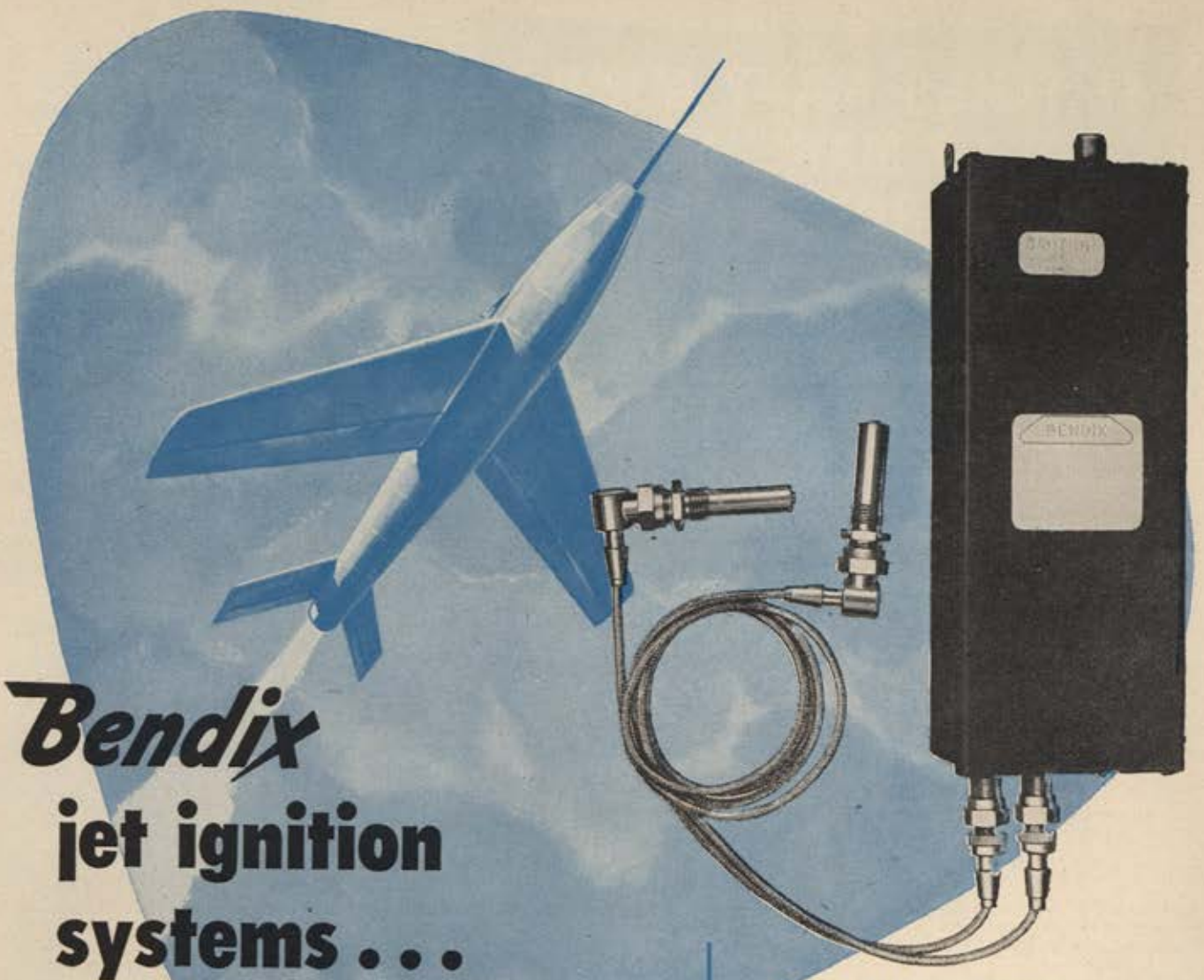

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For example, a comparison of the TLN-10 jet ignition system, produced by the Scintilla Division of Bendix, with earlier designs shows significant improvements in every operating characteristic —and at the same time original cost, operating expense and weight are substantially reduced.

Here, indeed, in the Scintilla TLN-10 jet ignition system, is a classic example of how the present national policy of greater value for the taxpayer's dollar is being put into practice.

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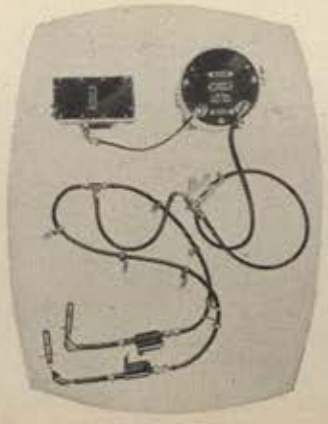

EARLY DESIGN
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TECH TALK

The first new airplane of the second half-century of powered flight was the **Convair R3Y Tradewind,** christened and launched last December 17 as the nation paused to pay tribute to the Wright Brothers. Now the first Tradewind has been test flown (right). Designed for more than 350-mph, the eighty-ton seaplane is America's first water-based turboprop transport. Convair predicts it will be able to cruise long distances at nearly twice the speed of existing transport seaplanes. Span of the Tradewind is 145 feet. It is 142 and a half feet long and fifty-one feet, five inches high. Four **Allison T-40s** drive the contra-rotating Aeroproducts propellers. The Tradewinds, which are said to be able to take-off and land in the open sea, will be operated by the Navy's Fleet Logistics Air Wings, Pacific Fleet.

More than 22,000 horses lift Convair R3Y off San Diego Bay for first flight.

It's official: The Federation Aeronautique Internationale has ruled that Lt. Col. F. K. Everest's speed runs last October 29 in North American's F-100 Super Sabre upped the **speed record mark** to 755.149 mph.

Boeing, maker of two USAF all-jet, A-bomb carriers—the B-47 Stratojet and B-52 Stratofortress—is making its bid to crack the British monopoly in the commercial jet transport field. In fact, predicts Boeing's president, William M. Allen, the deHavilland Comet should be completely outclassed by the **Boeing 707.** The prototype 707 (see cut) may fly this year but production models of the four-jet transport won't go on sale for probably another three years. Then, the best guesses have it, the 707s will clip along at 550 mph, carrying from eighty to 150 passengers at 35,000 feet and higher, for distances from 4,000 to 5,000 miles. Another jet transport just over the horizon is **Fairchild's proposed M-186** twin-jet passenger and cargo carrier that would be powered by two Wright J-67s and cruise at 570 mph. One of the M-186's most unusual design features is its "cusp" wing, a hybrid developed from the delta and conventional straight wing.

You won't find one of these on your automobile dashboard, at least for a few years, but the **Kollsman Supersonic Machmeter** is a mighty important piece of equipment aboard a high-speed research plane. One was on Maj. Chuck Yeager's X-1A when he hit 1,650 mph, or two and a half times the speed of sound, the reading shown at right. The Kollsman instrument, a mechanical computer, tells the pilot at a glance his speed in terms of the speed of sound, which varies with altitude. The Machmeter is operated by impact and static pressures, furnished by a pitot tube, which act on the sensing elements—a differential pressure diaphragm and an aneroid diaphragm.

How it looked to Yeager.

First photo of Boeing 707 shows details as jet transport nears completion.

The Air Force's **turboprop program** has moved into high gear with the first flight of the **Douglas YC-124B,** developed for ARDC as a flying test bed. The Globemaster mounts four **Pratt & Whitney T-34** gas-turbine engines in combination with **Curtiss-Wright** three-bladed Turbolectric props, each eighteen feet in diameter. This combination, say Douglas engineers, gives the huge transport sixty percent more horsepower than the conventional model. At take-off the T-34s each develop the equivalent of 5,500-hp. Since turboprop power plants operate most efficiently at altitude, the YC-124B's flight compartment is pressurized. Other engine and propeller

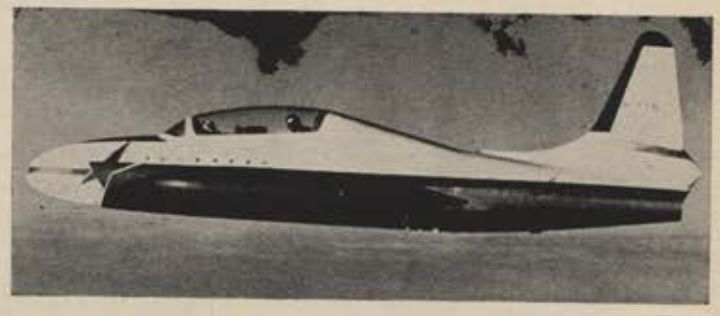
(Continued on following page)

The turboprop-powered Douglas YC-124B is expected to cruise above 300 mph.

combinations are expected to be tried out later this year on the Lockheed C-130 and the Lockheed Super Constellation, the latter for the Navy. Douglas has two other turboprop projects in the works—the C-132 and the C-133.

Even the seasoned old-timers took a second look the day the XV-1 was rolled out of its hangar at the **McDonnell Aircraft** plant in St. Louis. This wasn't just a new plane. It was a new concept of flight. The XV-1 is the **convertiplane,** with a rotor for vertical flight and wings and a propeller for forward flight. A joint development of ARDC, the Transportation Corps of the US Army, and McDonnell, the XV-1 is primarily to study application of the convertiplane principle to larger aircraft. There are pressure jets at the tips of the rotor blades. The blades autorotate when the convertiplane is flying forward. A **Continental** reciprocating engine supplies air to the jet units during vertical flight and power to the propeller during forward flight.

With hotter jets, like the North American F-100 Super Sabre, coming into production, hotter jet trainers will be needed, too. One, developed privately by **Lockheed** and now being demonstrated to the USAF and the Navy, is a two-place, 600-mph job with many of the features of the AF's Lockheed T-33 but with new ideas for advanced pilot training. These include a slow-down parachute for landings, speed and climb claimed equal to many combat jets, duplicate navigational and electronic aids, full-circle visibility with the rear seat raised six inches so the instructor can see his student better, and movable slats added to the front of the straight wing to permit safety in stalls. An **Allison J-33** powers the prototype, which is thirty-eight feet long, thirteen high, and has a forty-two-foot span.



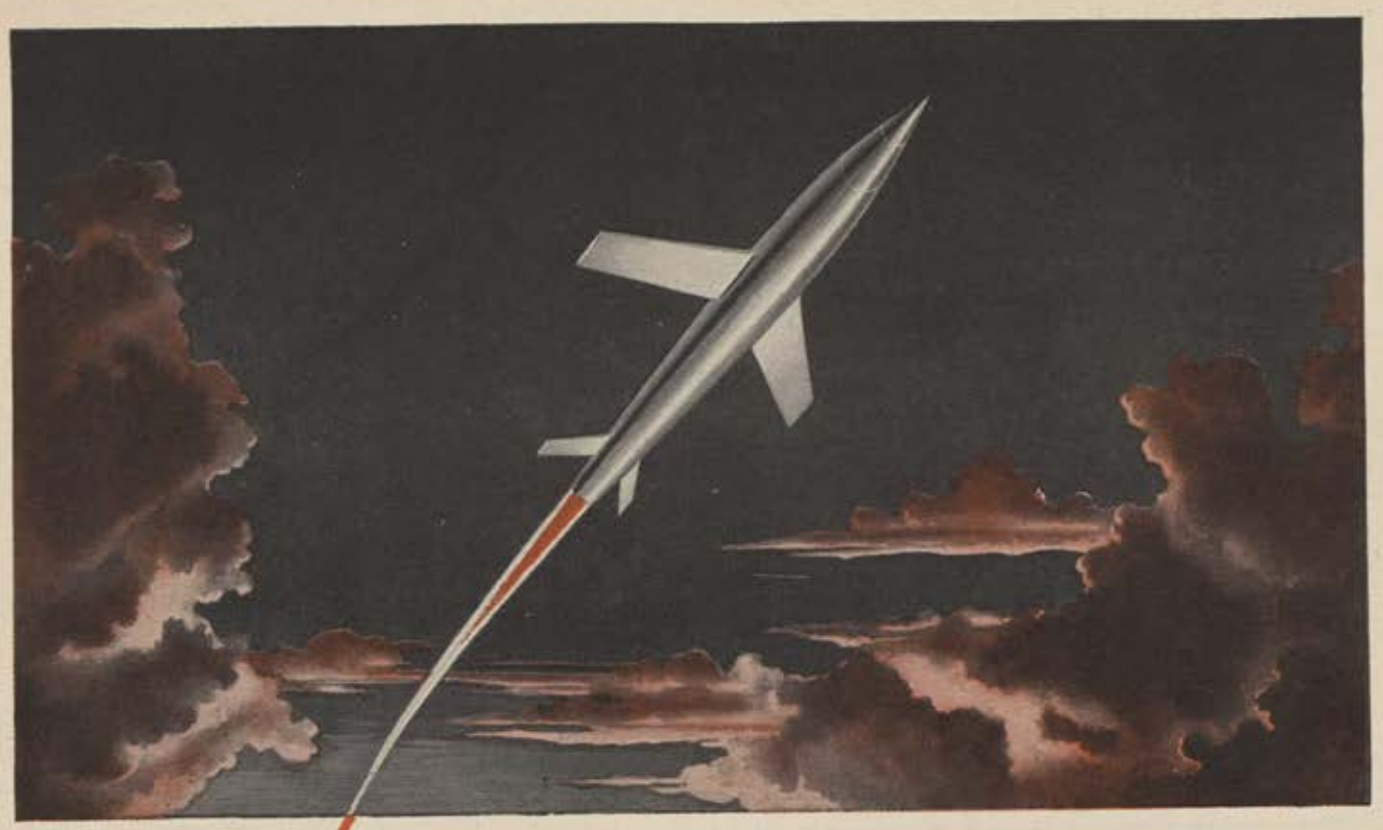
Lockheed's new jet trainer is in the 600-mph class.

Probably the first use of **plastic** as a structural material in aircraft was in World War II when WADC fitted a BT-15 with a plastic aft fuselage section and flew the plane 1,500 test hours. The fuselage proved considerably stronger than conventional aluminum on a strength-weight basis. WADC now has equipped a T-6 with plastic glass laminate wings (see cut), made by **East Coast Aeronautics, Inc.,** and has completed successful preliminary flight tests. Among plastic laminate's advantages: simpler construction, smoother surfaces, less electrical interference with electronic equipment. The wings are made sandwich-style of glass cloth laminate around a cellular cellulose acetate core.

Glass wings on a T-6.

A strange new breed of aircraft is the McDonnell XV-1 convertiplane.

The Air Force, with the **Raytheon Manufacturing Co.,** has developed new radar equipment that tests how successfully long-range broadcasts are received. The device, **Cozi** (communication zone indicator), sends out a beam along a transmission path. The beam returns, tells where it's been and if any jamming was encountered.



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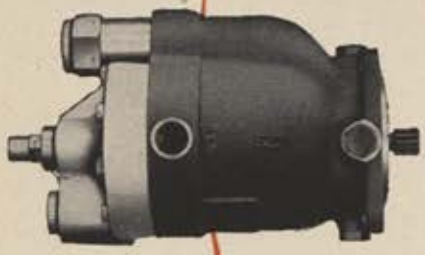

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We must not tolerate anything short of a truly professional officer corps in today's AF

LET'S EDUCATE OUR OFFICER CORPS

By Brig. Gen. Dale O. Smith

COMMANDERS do a lot of talking about their officers. They want them to be good leaders, to perform completed staff work, to understand finance and business, to negotiate successfully, to speak well, to run meetings and conferences, to write clear and pointed papers, and above all to analyze their problems objectively and come up with satisfactory solutions. How do officers get these qualities? They may be born with a certain capacity to learn, but the practical abilities they acquire are the accumulation of innumerable learning experiences starting from the cradle.

Of those who aspire to an Air Force career, we commission the ones who look like they'll make good junior officers. We have our sights set on the next few years. We need the skills necessary to man a 137-wing force, so we first want our second lieutenants to operate and maintain our many complicated machines. They must be flyers, navigators, engineers, or electronic specialists. To meet our quotas, for example, we take civilians and airmen into flying training with only high school diplomas.

So these young officers become specialists. They can do the work of junior officers every bit as well as the college graduate or the Ph.D. They are younger than the college grad and often far more enthusiastic about their particular specialties. From a short term standpoint the kind of specialized education provided by Air Training Command, augmented by learning on the job, provides us with the kinds of skills necessary to operate our Air Force. But what do we do to develop the broader, generalized abilities that the commanders are always asking for? Leadership, staff work, speaking and writing ability and the like?

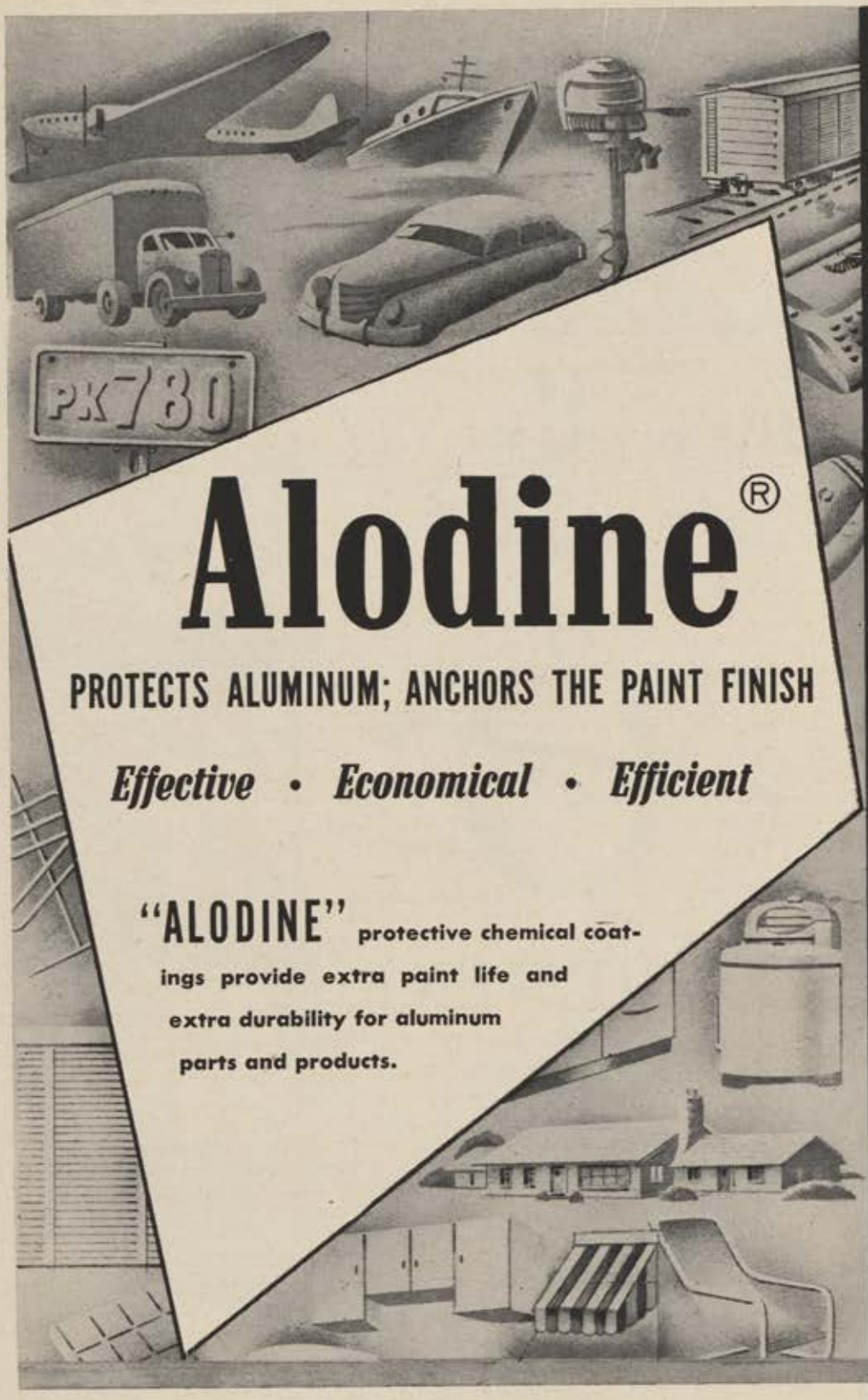
We try to meet these needs with our Air University programs. But we are slipping behind every year. Assuming, for example, that we can correct the educational deficiencies in our junior officers by sending them to a ten-week Squadron Officer Course (an assumption that is hardly warranted), we turn out only 2,800 each year. Since we commissioned 6,452 new second lieutenants in 1952, the benefits of Squadron Officer Course are obviously far from universal. Add to this the almost 8,588 first lieutenants and captains who were recalled last year, and we get a grand total of about 15,040 junior officers who would conceivably need this kind of education. So on this basis Air University fulfills about nineteen percent of the yearly USAF requirements, and this only for junior officers.

Let's look at the flow out of the junior officer reservoir. Of the roughly 90,000 active junior officers last year, about 19,446 left that grade bracket either by separation, promotion or other reasons—a loss of about twenty percent a year, or a complete turnover in five years. Actually, this isn't quite the case, for at least 6,000 are Regulars and rather permanent, as are many career Reservists. But it does appear that we cannot assume all Squadron Officer Course graduates have been stockpiled in the reservoir of 90,000 junior officers. Even so, of the 14,658 SOC (and Air Tactical School) graduates, we'd be lucky if half of them are active junior officers today—say 7,000 as a conservative estimate. This means that no more than six percent of our junior officers have been to SOC. Moreover, this percentage won't increase under present conditions.

Early educational boards, including the Fairchild Board, all recommended that every junior career officer attend the first level service school. Obviously this isn't being done. The ten-week school is so short that the many vital subjects can be treated only briefly. And only six percent of the officers get this. If all junior officers were to stay in grade and active, with no flow in or out of the bracket, it would take twenty-seven years at the present rate before every lieutenant and captain had completed Squadron Officer Course.

The Field Officer Course is twenty-two weeks long and thus provides a somewhat better opportunity for thorough study, but only about 1,000 officers per year are graduated. Without considering the yearly flow into this grade bracket, at the present rate it would take about twenty-four years

(Continued on page 62)



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for every major and lieutenant colonel now in the Air Force to take the Field Officer Course. Obviously, only a small percentage of field officers actually attends.

It is much easier to set requirements for skill training than for professional education. If we expect to have 1,000 new-type fighters by 1956, we will need a precise number of pilots and mechanics to fly and maintain them. Add up all complementary skill requirements for these 1,000 new fighters and you get a specific and defensible training program. Upon such precise requirements are air bases activated and school buildings constructed.

But how are professional educational requirements computed? Generally speaking, they are not. After Korea, educational requirements were geared more to the capacity of our educational program. Some courses were shortened to produce more graduates. But this move was obviously at the expense of quality in the school. No one will argue that you can learn as much in ten weeks as in eighteen, all other factors being equal.

Since there were no educational requirements geared to the size of the Air Force, the Air University program was the first to be slashed after Korea. Some farsighted people—such as Gen. George C. Kenney, then commanding general of the Air University, and his deputy, Maj. Gen. Joseph De F. Barker—held on grimly to the remnant and kept officer education from going under completely. But they were lucky to hold what was left. There was no expansion of Air University relative to the mushrooming of the rest of the Air Force. Not a single academic building or BOQ was built at a time when training structures of every sort were sprouting all over the Air Force. And Air University's two bases, Tyndall and Craig, which had been turned over to training, were not restored.

Between 1950 and 1953 our total officer strength doubled, yet professional education remained essentially static. Flying and technical school quotas for officers were tripled while professional officer education plodded along unchanged. The trickle of graduates from the truncated schools of Air University is not likely to fulfill the demands of commanders.

THE AUTHOR

General Smith, 42, has written for AIR FORCE several times. He's Director of Education at Air University. His views are his own, not to be construed as official or unofficial policies of the USAF.

We tend to give precedence to the things that we cherish. Thus, in today's Air Force, we lay great emphasis on the skills necessary to fly and maintain our weapons, and properly so. However, although we clamor for the kinds of people professional education produces, we do not attach commensurate importance to the effort necessary to develop them. One reason advanced is that operating commands cannot spare officers for advanced schooling. Are we unwilling to pay the price for what we need? The Air Force may always be involved in one crisis or another, yet we must also build for the long-range future.

Service as a career officer in the Air Force constitutes a profession. A profession is characterized by, among other things, a body of knowledge based on theory and practice. Professional knowledge is largely developed and taught in professional schools. And the Air University is the professional school of the Air Force.

If the above statements are valid, the inescapable result of our present practice is that for the predictable future the Air Force will be run by sub-professional officers. This may be one reason why we are failing to attract the caliber of material a respected profession should merit. It no doubt has much to do with our hesitating progress in presenting Air Force doctrine to the country.

Let's survey where we stand, professionally. No man is admitted to leadership in the medical profession who is not at least a college graduate, and usually another four to nine years of rather formal education are necessary to assure him top ranking. The legal profession also requires a bachelor's degree as the first step, followed by years of graduate study. Engineering, business, education, and every reputable civilian profession *starts* with college graduation. How does the Air Force stand in this category of fundamental education? Only forty-three and six-tenths percent of active Air Force officers have college degrees.

We can always point to our Abraham Lincolns and assert that formal education is not necessary, that on-the-job training and individual study will give us plenty of self-made men. But there are pitfalls in generalizing from exceptions. We know, too, that precious few of our officers have the motivation to burn midnight oil over books. So if we are to raise our educational stature, we must provide a system by which it can be achieved.

How do we stand in this respect with relation to the Army and Navy? We are low man on the totem pole. Forty-five and six-tenths percent of Army officers and fifty-five percent of Naval officers are college graduates. Moreover, both of these services have their undergraduate academies. The Air Force may soon but today has none. And on top of this both other services provide at least ten *months* of formal schooling for their junior officers, as opposed to our ten-*week* course.

Thus the Air Force mission is being promoted by a corps of officers which is definitely at a disadvantage in dealing with the other services and with professional civilians. With these educational shortcomings it is hard to be convincing, and until we lift ourselves from the quagmire of professional deficiencies, we shall forever face disappointment in the furtherance of a mission we feel to be fundamental to national survival.

How can we get out of this educational hole? First, we must concentrate on those officers who will be in the Air Force longest—the career men. We spin our wheels to educate short-time people whose contribution will be limited at best. There is a net national dividend in the trained men we send to industry, but our budget does not provide for this. Our lawmakers expect us to build an Air Force, not subsidize industry. Other government activities and grants look after the nation's business. So when our budget pays for education we must assure that there is a direct return to the Air Force.

Next, we must provide undergraduate education for those who have been denied it and can profit by it. An enlarged *undergraduate* Civilian Institutions Program would do this. The recent increase in our Civilian Institutions Program is an enlightened forward step. The USAF authorizes the Institute of Technology to matriculate 540 qualified undergraduate students this year, and 350 graduate students, all in civilian universities. But this undergraduate quota only begins to satisfy our professional requirement. To avoid the criticism that Johnny is being drafted from college while the Air Force is sending fully trained officers

(Continued on following page)

back to school, this program should be concentrated at one or two large universities and its purposes well publicized.

Finally, we should automatically offer undergraduate education to all officers to whom we tender regular commissions, when those officers have not been able to complete college. It is only fair that they be treated as well educationally as the separated veteran, and it is certainly to our national advantage.

Without question, we must strive for an Air Academy which will provide the solid corps of career officers who set the standards for the profession. An academy will give us a clear educational and professional orientation for the future, but it will not do much to correct our existing situation. We can, of course, use it to complete the education of young officers who choose and are selected for an Air Force career, but this, too, is looking to the distant future.

As to schooling the professional field of military aviation, our best immediate bet in raising our general educational level is through providing firm requirements for our officer service schools. How can this be done?

After thoroughly researching the problem, Lt. Col. Wendell Hammer has proposed a method. This is his plan: Taking the mission statements of the general duty schools in Air University, he assumed that if SOC, for example, were preparing officers for squadron command, all squadron commanders should be graduates. If it also aimed at developing wing operations officers, all wing operations officers should be graduates, and so on. Using T/Os, T/Ds and the structure and size of the Air Force as guides, he developed percentage requirements for each school *based upon total Air Force officer strength*. It came out this way:

		(Number of officers who should be grads)
SOC	64%	82,000
FOC	12%	15,400
AWC	2%	2,580

He went further to see how much of this requirement the Air University had trained out. The results were:

		(Actual grads)
SOC	10.6%	14,280
FOC	3.3%	4,400
AWC	.5%	650

It must be realized that nowhere near the actual number of grads are now on active duty. It would be safe to say that no more than half are now serving.

Colonel Hammer has shown us a realistic system for computing requirements and for defending our senior school program. If it were adopted we would at least have some basis for recovering the lost ground of the past several years. Presently we are still slipping behind. A solid footing is necessary before we can recover.

We cannot wait for utopian conditions to educate our officers. We must determine our numerical requirements for professional officers and with realism and courage select and educate for exacting responsibilities. We must pay the price of true effectiveness. The professional educational requirements of the Air Force do not necessarily coincide with the capacity of Maxwell Air Force Base. We must not tolerate anything short of truly professional officers and we must begin now to work toward that goal.—END

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ing. While agreeing that there is some loss of basic military skills with the passage of time if no unit training is maintaned, the Adler committee declared that "compelled unit participation would damage morale." On the other hand, the committee said, "voluntary unit participation tends to create *esprit de corps* and obviates objections when the unit is called."

The Reserve Forces Policy Board study specifically called for a norm of forty-eight drills and fifteen days of field training each year for members of the Ready Reserve and for the kind of training "designed to meet mobilization requirements." The RFPB staff study saw no reason why Standby Reservists should be required to participate in training but recommended that they "may do so on a voluntary basis."

If the Pentagon task force which must report to the White House with a recommended "new look" for the over-all Reserve program is influenced by the thousands of words available as bibliography, certain conclusions appear valid.

1. The Reserve must be given a definite mission.

2. Training must be an integral part of the mission requirement.

3. The military will retain the authority to call units and individuals of the Ready Reserve to active duty if the need arises.

4. Units and individuals of the Standby Reserve will be called to active duty through Selective Service, but in the numbers and specialties requested by the military.

In its report, the Senate subcommittee observed that "we must retain the fibers of military strength in the Reserve and National Guard." Despite the miracles of the push-button age, the subcommittee concluded, trained manpower is the key to retention of this strength. "In fact," the Senators said, "the need for trained men is more acute by reason of the suddenness of modern war. Our civilian Reservists of old were called minutemen—the time factor in the Reserves today is equally important."

The Johnson Board, noting that there is no "cut-rate" solution to the complex Reserve problems, determined that the present Reserve plan is basically sound but that it needs "understanding, appreciation, and implementation at all levels."

In this connection, the Johnson Board said, the Reserve Plan must "realistically approach the Air Force's present ability to equip, recruit, and train its Reserves."

Moreover, this committee established seven cardinal principles which it deemed essential to the success of any plan.

- It must be objective. That is, it must fill a requirement for National Defense.
- It must be an integral part of the US Air Force at all echelons.
- Its scope must not exceed the Reserve manpower potential and quality rather than quantity training must be emphasized.
- It must be so simple that everyone will understand it.
- It must be stable.
- It must have incentives that will make a Reservist want to take part and it must enable the Reservist to participate without inconveniencing himself.
- It must be acceptable to the general public and appreciated as being vital to national security.

It is doubtful that any Reservist would quibble with these worthy aims. The question occurs on how to achieve them.

The Johnson Board felt that creating the new Air Reserve Centers would help, particularly if, through them, specialized training were made available to all Reservists in the areas served. Brig. Gen. Robert Condon, deputy for Reserve affairs at ConAC, who played a leading part in the development of the center concept, believes the fifty locations will make for considerable improvement in the current program.

When Mr. Flemming sent the Appley report to the White House, he called attention to the committee's conclusion that "a program based on a training period which is insufficient to provide the kinds of military skills most urgently required creates the illusion rather than the substance of a trained military reserve."

The comment indicated clearly that Mr. Flemming believed the Reserve program of the future should disregard the ancient concept which translates military manpower into sheer numbers and be founded on the new concept that military manpower means special aptitudes and skills.

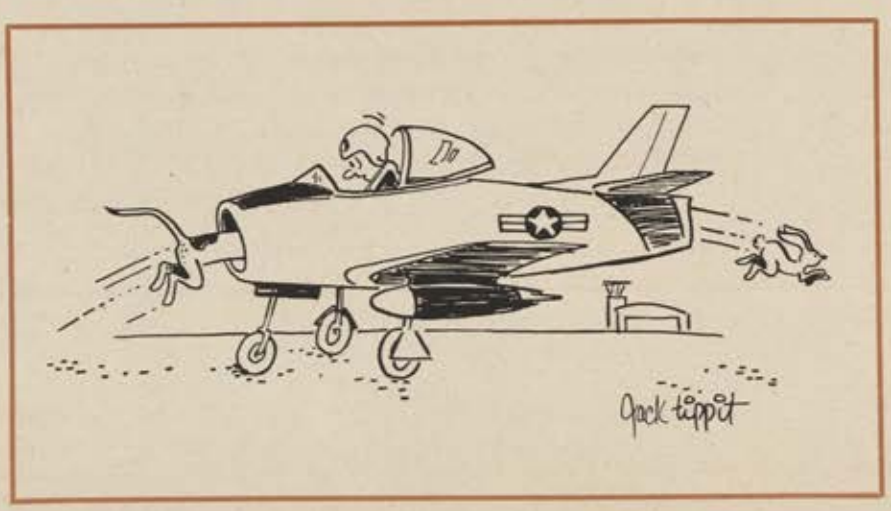
Herein lies one of the complexities of the Reserve program. Future airpower, even more than modern airpower, must be pegged to special aptitudes and skills. So there will continue to be a pressing need for courses of instruction to keep the military skill of the specialist at a high level of proficiency. But the importance of units cannot be minimized.

When you reflect that some of the best brains in the country have been kicking the problem around for many months and no one yet has come up with THE program, the difficulty in finding a solution becomes apparent.

The Adler Committee suggested that today "there may be no real security from attack, but there can be preparedness." The Senate subcommitte went a step farther and counselled that "a better state of readiness depends on the building and maintenance of a strong Ready Reserve force."

There are literally thousands of Reservists like our friend from Florida who seek only the opportunity to be active and to make their contribution to that "better state of readiness" the nation requires.

In whatever plan emerges from the recesses of the Pentagon and is hammered into policy at the White House and on Capitol Hill, these men expect to find the lasting answer to "what gives with the Reserve program."—END



MOBILIZATION NEWS

BY JAKE CULPEPPER

RECALL — A few direct appointments and recall of such specialists as legal officers, chaplains, and medical officers will be made by AF between now and first of July, this year. Otherwise, AF says it does not anticipate the recall of any other officers since the normal flow will meet present personnel objectives.

AF-ROTC — AF has revealed that a total of 16,900 AF-ROTC seniors and juniors have agreed to enter flying training. Some 10,750 AF-ROTC members who graduated last June (or who graduate by April 30, 1954) are now entering active duty in monthly groups, whether they fly or not. The current senior class (those who graduate between May 1, 1954, and April 30, 1955) totals 14,600. Of the 14,600, some 8,800 have agreed to fly; of these, AF further expects that only 7,000 will actually enter flying school. . . . Army will soon transfer some of its ROTC graduates to AF which has indicated that it can absorb between 3,000-4,000 from this source.

OCS — Within a year's time AF has witnessed the backlog of qualified applicants for OCS take a drastic dip from a comfortable high of 3,450 to a low of 500. Over the same period, the flow rate of applications dropped from 100 to eight per week. These changes, which occurred rapidly, were particularly noticeable following the '54 AF budget cut which resulted in a seventy-five percent slash in the OCS program. The effect this cut had on the program, AF says, is one of the prime contributing factors to the current lack of interest in OCS. To prevent short class entries, increased emphasis is being placed on publicity and commanders have been requested to encourage qualified airmen to apply for officer training.

FOREIGN SERVICE — A new "volunteer" policy authorizes airmen to volunteer for foreign service and select three overseas areas of preference or world-wide assignment. Enlisted personnel may volunteer for more foreign service while serving overseas. Provided their services can be utilized, volunteers will be assigned to one of their areas of preference.

NEW UNITS — Tactical Air Command has taken the newest AF units — combat control teams — under its wing. These teams, consisting of fourteen men each, are dropped ahead of troop carriers to mark the drop zone with recognition panels, smoke, and special communications equipment for guiding aircraft. To date, the AF has only half its authorized number of twelve teams. Future plans call for one team for each medium troop carrier group world-wide.

REGULATIONS — AFR 39-29 covers grade adjustments for Reserve airmen. It sets forth policies and requirements governing grade adjustments of certain airmen not on active duty. . . . AFR 39-58 contains new policies and requirements covering promotion of airmen not on EAD. Airmen assigned to VARTUs will be promoted on a new percentage control basis.

AF ACADEMY — Senate has passed Air Academy bill with three amendments to the version passed earlier by the House. Most important restricts AF Secretary Talbott, who according to House version would have selected Academy site. Senators directed that Mr. Talbott name a five-man commission to survey sites. If their decision is unanimous, Talbott must accept it. Otherwise commission picks three sites from which Mr. Talbott chooses one. Ceiling cost on the Academy was set at $126 million by the Senate.

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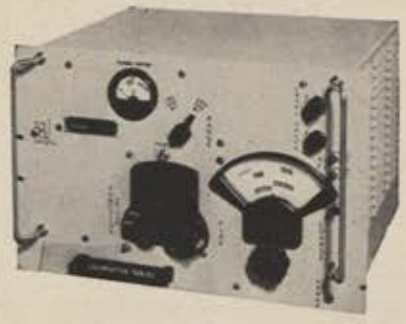

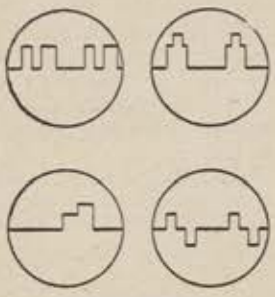

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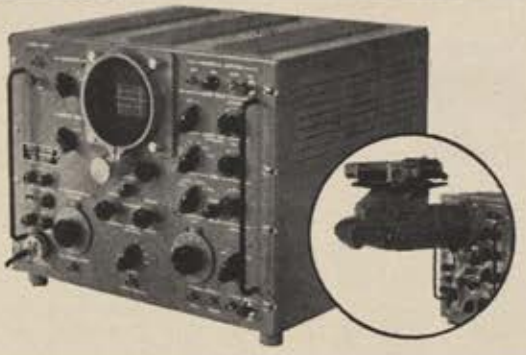

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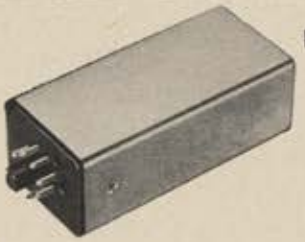

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GUARD FLIGHT PAY

The Section 5 Committee will give the issue another whirl

The last time the Section 5 Committee on National Guard policy met, it deliberated at great length the issue of flying pay for Air Guard pilots. The committee, composed of five Air Guard officers under provisions of Section 5 of the National Defense Act, will give the issue another whirl when it meets again this month.

This is the background: For some time ANG pilots have felt they were entitled to full monthly flight pay. Although they are required to accomplish the same 60-2 minimums as pilots on active duty, ANG birdmen get only a fraction of the active duty hazard pay.

The Section 5 Committee asked Air Force to study the problem and recommend a solution. The study has been completed and has been sent to the National Guard Bureau for comment before being returned to the committee for positive recommendations.

The study, it is reliably reported, turns down the proposal for full monthly flying pay. Instead, it suggests that Air Guard pilots be authorized additional drills. However—and this is where the proposal is apt to run into considerable flak—these drills would be authorized only for tactical pilots.

If adopted, this policy would exclude from the additional drill pay rated pilots in the air base group, maintenance group, etc. It's safe to wager that these non-tactical ANG pilots would point out that they're being discriminated against, since non-tactical pilots on active duty draw the full monthly flying pay authorized for their ranks for tooling around in C-47s and C-45s.

° ° °

Organization of ANG replacement squadrons will move into high gear on July 1. In all, the states have asked the Bureau for authority to organize ninety of these units. That's three more than the Bureau has money for. These replacement squadrons can't be formed until the parent squadron has reached eighty percent of its authorized strength and has the same percentage of equipment on hand. In the event of emergency, these squadrons could be called as units, but more likely would be absorbed by the parent squadron to bring it to war strength.

° ° °

NGB is continuing to stress the Guard Aviation Cadet program which is behind schedule. The Guard still needs 750 new pilots a year to offset attrition. In the first six months of Fiscal Year 1954, some 279 Guard officers and airmen entered cadet training. This is about seventy-four percent of what ANG needed for the six-month period.

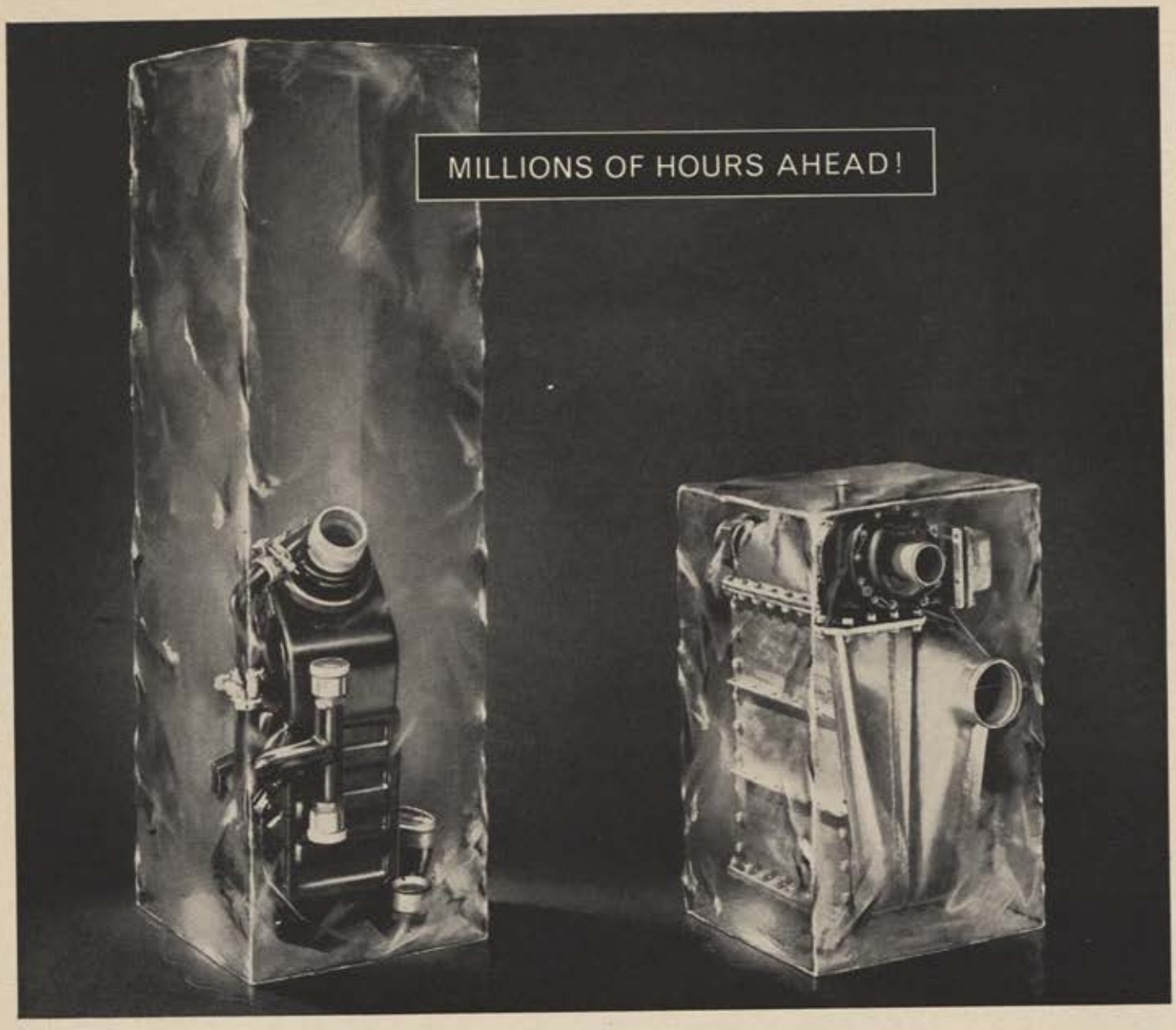
As the cadet graduates return to their units, pilot age is lowering, from an average of thirty-two to thirty.

° ° °

An Air Guard team will compete in the Air Force-wide gunnery meet which is scheduled June 7-13 at Nellis AFB, Nev., following a four-year lapse due to the Korean war. The team will compete in the air-to-air and air-to-ground phases. Firing members will be selected from: Lt. Col. George W. Edmonds, 144th Group, Hayward, Calif.; Maj. Philip Gangemi, Jr., 144th Maintenance Sq., Hayward; Maj. Milton R. Graham of Hayward's 194th Sq., who won the ANG gunnery title at Boise, Idaho, last year; Maj. Roland R. Wright and Maj. Robert E. Erickson, 191st Sq., Salt Lake City; Maj. James R. Edwards, 192d Sq., Reno; Capt. A. R. Jones, 191st, Salt Lake City; and Capt. Arthur J. Porter and 1st Lt. James A. Kilpatrick, 194th, Hayward.

° ° °

Notes on the back of a Form 175 . . . Field training for about 50,000 Air Guardsmen will begin June 12. Among the first units to go into the field will be the 199th Fighter Squadron in Hawaii, 113th Wing of D. C., Maryland, and Delaware; 123d Wing of Kentucky, and 140th Wing of Colorado. About forty of the eighty-seven tactical squadrons will have jets when the training time rolls around.



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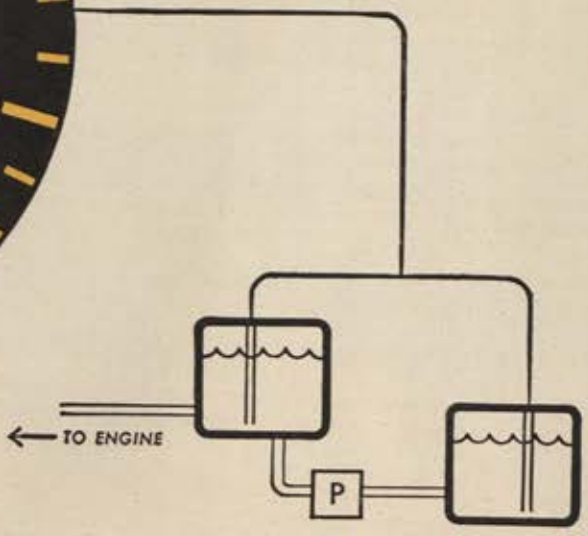

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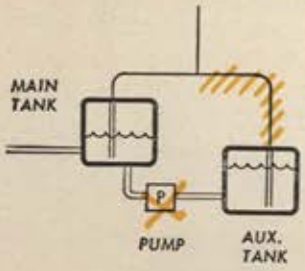

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WAC SQUADRON INSTALLS OFFICERS

Mrs. Clara Haubrich becomes Commander of the New York unit in an installation ceremony at the Waldorf-Astoria Hotel

On December 26, 1946, eleven months after the Air Force Association was organized, the first **New York City Squadron** was organized and chartered. The unit was formed by a group of ex-WACs headed by Mary Gill (now National Director Mary Gill Rice). On January 10, 1947, AFA's first President, Jimmy Doolittle, formally presented the Charter.

A series of constructive programs began in 1947, when the girls visited Halloran General Hospital to entertain the patients. The party was so successful that the program has been continued, not only at Halloran but at other area hospitals.

Besides the hospital program the WAC Squadron has participated in many others and annually sponsors an outstanding officer installation.

This year's officers were installed on February 13 at the Waldorf-Astoria Hotel. Maj. Gen. Roger J. Browne, ConAC Vice Commander, spoke. Mrs. James H. Doolittle headed the honored guest list. **Mrs. Clara N. Haubrich,** 9107 2d Ave., North Bergen, N. J., was installed as Commander by New York Wing Commander David Levison. Other officers are Sue Mosca, Vice-Commander; Edna Schenck, Treasurer; Emma Carr, Recording Secretary; and Marianne Simone, Corresponding Secretary.

Among the five new AFA Squadrons saluted this month is the **Mohawk Squadron** of Kansas City, Mo., which held its installation dinner on February 2. Otis F. Bryan, 9000 W. 67th St., Merriam, Kan., was elected Commander. Bryan is a former pilot for President Harry Truman. Other officers include E. W. Dunn, Vice Commander; John H. Yonts, Treasurer; and R. R. Peters, Secretary. Councilmen are Mont E. Goodell, Charles D. Daily, and Frederick G. Richardson.

The **Robert S. Hart Squadron** is the new AFA unit in New Orleans. At a meeting

(Continued on following page)

SQUADRON OF THE MONTH

San Diego, Calif., Squadron

CITED FOR

the outstanding Squadron programming designed to enhance the prestige of the Squadron within its community. Air Force Association particularly commends the tours of Air Force bases that have been planned for Squadron members.

On a visit to the University of New Mexico, Albuquerque, AFA President George C. Kenney visits with AF-ROTC Cadets. From left, Cadet Col. John E. Manias; Cadet Jerry Miller, social chairman of the Albuquerque AFA Cadet Squadron; Cadet Lt. Col. John A. Farris, Commander of the AFA Cadet Sqdn.; and Kenney.

Col. Charles P. Prime (USAF, ret.), Commander of newly formed Fairfield, Calif., North Bay Sqdn., admires AFA Charter. Others, from left, are Dan Root, school superintendent; Brig. Gen. Stanley J. Donovan, 14th Air Division Commander, Travis AFB; and Robert Thierry, a civilian employee at Travis.

AFA Executive Director James H. Straubel cuts AFA 8th birthday cake as Regional V-P George Hardy looks on at Washington party.

AFA NEWS — CONTINUED

held late in January, F. O. Rudesill, 4800 Airline Highway, was elected Commander. Other officers are Vincent Caruso, Vice Commander; Clyde Hailes; Secretary; and Philip Eisenwinter, Treasurer. Councilmen are Louis Korn, Salvador Lococo, Wilburn Causey, and James Hebert.

In **Daytona Beach, Fla.**, the group that formed the Air Reserve Association Chapter has voted to become an AFA Squadron, and late in February applied for a charter. The names of the officers will be announced next month.

Former members of ARA in Seattle have taken a similar step and formed the **Rainier Squadron.** The Commander is Robert S. Wilcoxen, and the Secretary-Treasurer is Gunnar J. Sather. Even before receiving the Charter, this Squadron sponsored a social affair. Lt. Gen. Leon Johnson, Commander of ConAC, and Brig. Gen. Robert Condon, his deputy, were guests at a reception and banquet at Sand Point Naval Air Station in Seattle. Officers and members of the new Rainier Squadron were hosts.

The newest Squadron in the California Wing is the **First Reserve Squadron,** of Long Beach. This, too, is the result of a vote by the membership of the former ARA Chapter there to become an AFA Squadron. Its membership of 105 makes this unit one of the largest Squadrons in the Wing. John I. Bainer, 2516 Lesserman St., Torrance, was elected Commander. The other officers are Charles Tinucci and Joseph Stetina, Vice Commanders; Floyd Damman, Secretary; and Claude Kenner, Treasurer. Councilmen are Glenn Arbogast, William Brooks, Willard Powell, Richard Trevor, Dorothea Affronte, and Helen Hawkins.

The **Detroit Squadron,** in a tribute to the Americans who lost their lives at Pearl Harbor, sponsored a ceremony December 7 in Detroit's Veteran's Memorial Building.

All three services participated in the program, and several hundred Detroiters attended the ceremony. The principal speaker was Air Force Capt. Herbert Marlett, who described his experiences as a prisoner of the Communists for thirty-eight months in North Korea.

On February 1, representatives of all active AFA Squadrons and Wings gathered in the Commodore Perry Hotel in Toledo, to discuss **Regional and Squadron problems** and programs.

Regional Vice President George A. Anderl of the Great Lakes Region presided over the meeting. The accomplishments of the past ninety days were reviewed, along with the plans for future activities.

At the same time that the Region was discussing its problems, the **National Auxiliary** Board of Governors was also meeting in Toledo. Marietta C. Miller, National President, presided. Membership and organization were among the problems discussed.

California's Wing Convention Committee has admitted it is hard to improve on the success of last year's affair, but has announced a program designed to do this very thing. A reunion Friday night, April 23, will lead off the three-day event in Santa Monica. The following day will be filled with a morning business session, luncheon, and an **Airpower Symposium.**

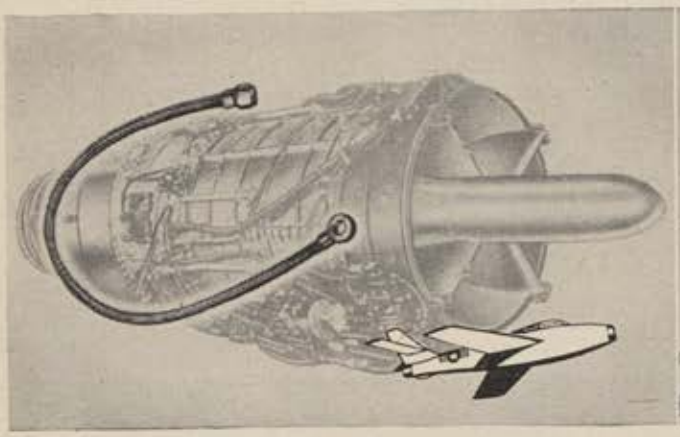
Guest speakers at the Symposium will be Edgar Schmued, Vice President of Northrop ("Military Aircraft"); Dr. Heinz Haber ("Space Travel"); R. C. Sebold, Vice President of Convair ("Guided Missiles vs. Planes"), and Dr. Chauncey Starr of North American ("Atomic Energy in Aviation"). Douglas Aircraft and Lockheed have also been invited to participate.

The Convention will wind up with a brunch on Sunday morning, when Wing awards will be given to selected individuals. William W. Walker, past Wing Treasurer, is Convention Chairman. He is being assisted by Joseph D. Myers, Santa Monica Squadron Commander, and a host of other Californians. All AFA members are invited to attend and especially AFA officers and Wing and Squadron Commanders.

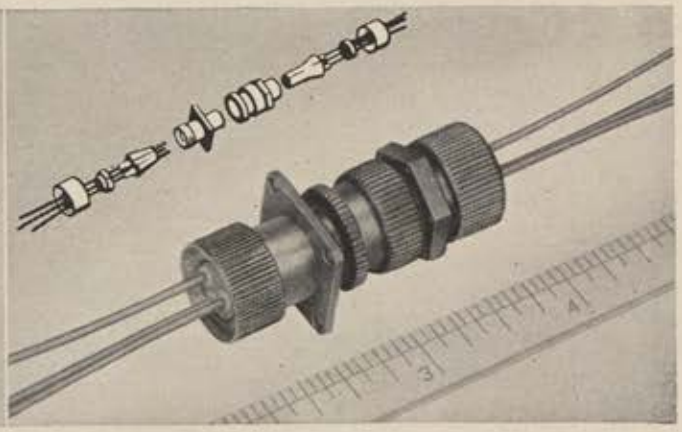
Baltimore Squadron—AFA's oldest unit

(Continued on page 77)

Four design ideas you can use right now...



DEPENDABLE FUEL FEEDING. Fuel for the J65 Turbojet Engine is injected to the burners through Titeflex® flexible metal hose. Tough, lightweight Titeflex—tested for temperatures from —70°F. to +600°F. and for pressures up to 500 psi—reliably conveys fuel to engine nozzles; withstands vibration and rough use; is excellent for complex configurations.



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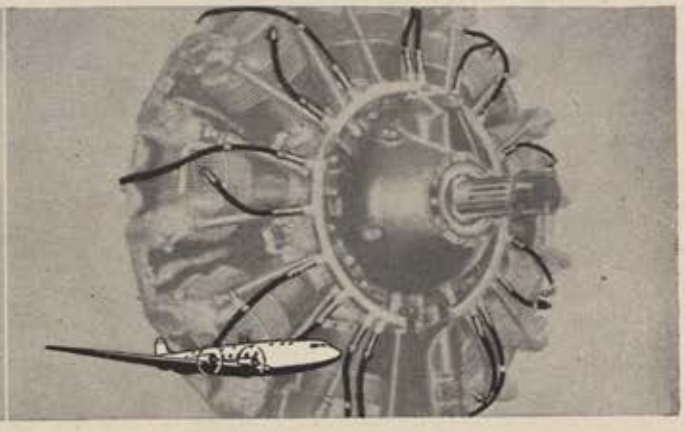
CUSTOM WIRING SYSTEMS. Titeflex specializes in designing and building special "packaged" wiring systems and component assemblies for today's complex aviation and guided missile installations. These may be jacketed with protective silicone or other compounds—and Titeflex Special Connectors used as integral parts solve complex wiring problems.



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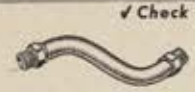

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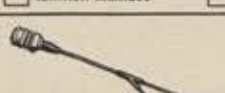

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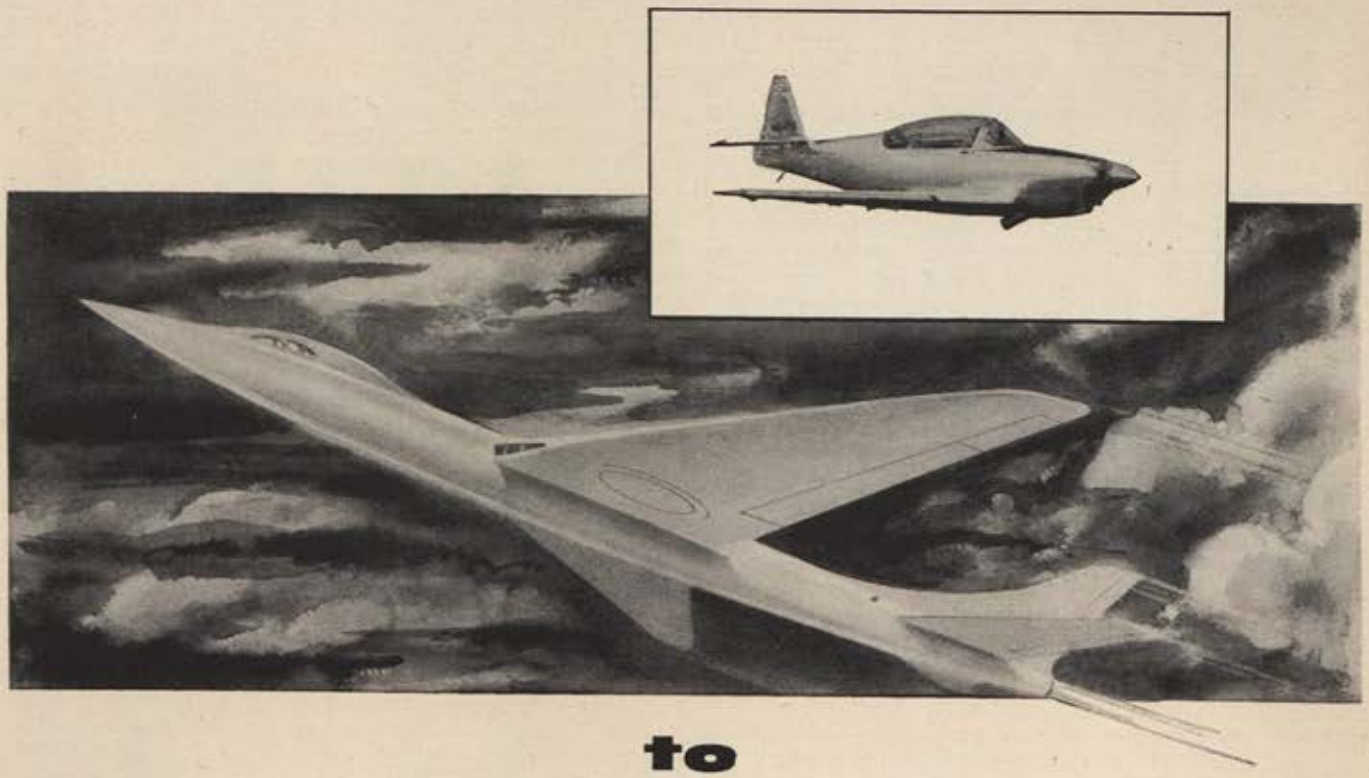

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AFA NEWS——CONTINUED

—held its annual installation banquet and dance at Fort George C. Meade on February 26. Meir Wilensky, out-going Commander, was chairman. Music was furnished by the Airmen of Note, the USAF dance band, under the direction of Warrant Officer Fred Kepner.

Replacing Wilensky as Squadron Commander is Henry R. Rosendale, Jr. John S. Warner was installed as Maryland Wing Commander, replacing Charles W. Purcell, who is also a National Director. Installation officer was George D. Hardy, Regional Vice President for the Central East Region.

CROSS COUNTRY . . . AFA's Executive Director **James Straubel** and Program Director **Ralph Whitener** have returned from a pre-convention trip to Omaha, site of the 1954 Convention. The Convention agenda is shaping up . . . At the **National Aviation Education Council** meeting in Atlantic City, Ralph Whitener, representing AFA's Executive Director, addressed the Council . . . Almost unnoticed in credit given to Arthur Storz's membership campaign in downtown Omaha, a separate drive has been carried out at **Offutt AFB**, where 419 service members have been obtained. Thanks to Col. A. J. Beck, Base CO, and Lt. Harry J. Dalton, Jr., OIS . . . AFA members in Chicago were guests at a meeting at which a film of the capture by aircraft carrier of the German sub **U-505** during World War II was shown by Adm. Dan Gallery . . . **AFA's Medical Division** is planning a reunion at the Omaha Convention. All AF Medical Corps veterans should write Dr. Richard J. Meiling, University Hospitals, Columbus 10, Ohio . . . **Wing Conventions:** California, Santa Monica, April 23-25; Ohio, Cleveland, April 25; Pennsylvania, State College, May 22; Illinois, Chicago, June 6; Michigan, Flint, June 13; Wisconsin, Milwaukee, June 27 . . . In memoriam—**Fred Eisert,** member of the San Diego Squadron, killed January 23 while piloting a private ambulance plane from New York to the West Coast . . . **West Suburban** (Ill.) Squadron held its first installation dinner March 27 in Eagle's Hall, Forest Park, Ill. . . . Chicago's **Southwest Squadron** announces an Airpower Forum on March 4 . . . The District of Columbia's **Capital Squadron** now meets in the Perpetual Building and Loan Company's auditorium.—END

AFA HAS MOVED

Air Force Association's Washington Headquarters have moved to a new address. Address all correspondence to:

Air Force Association
The Mills Building
17th St. and Penna. Ave., NW
Washington 6, D. C.

An Early Burgess-Dunn. This pusher-type biplane was probably the first flying wing in history. Ours had the same droopy look but a nacelle added.

BY THE SEAT OF MY PANTS— BELL BOTTOMS, That Is

That's how we flew in the early days—the days of the Burgess-Dunns and Aeromarines. And the bell bottoms were just one hazard Navy pilots had

By Frederick W. Keith

I WELL remember that day back in June of 1917 when Lt. Sam Pierce, USN, beckoned me over to the Burgess-Dunn seaplane drawn up on the beach. "I'll take you up next, Keith," he said. "Ever been up before?"

"No, sir," I gulped, clutching my brand new cloth helmet and goggles.

I was a seaman in the Navy at the time, bell bottom pants and all. That was our flying costume, too, along with a helmet and a pair of goggles which we had to buy out of our own pocket. And those bell bottoms, in the end, proved rough on pilots. Several embryo flyers were killed when the excess yardage in their trousers got caught in the exposed pulleys carrying the control wires.

A couple of weeks previously a group of us had been sent from the Brooklyn Navy Yard to Bay Shore, Long Island, for flight training. But to our chagrin, when we arrived at the "air station," we found nothing there but a naked meadow on the edge of Great South Bay. It hadn't even a shed, much less an airplane.

For the next two weeks we pitched tents, built heads, laid water pipes, and erected a sloppy hangar of sheet metal which ultimately proved too small to get a plane into. We ate at a second-rate hotel in town.

But eventually our labors paid off when Lieutenant Pierce flew in with our first seaplane and taxied it proudly into the beach. The Burgess-Dunn had covered the forty miles from New York with only one forced landing!

It was a pusher-type biplane, probably the first "flying wing" in the history of aviation, being completely tailless. Hence, no rudder, no elevators, no stabilizers. The ailerons on the swept-back wings were the only movable airfoils, and served in a dual capacity. When the wheel yoke was moved forward or backward, the ailerons worked in unison and functioned as elevators. Turn the wheel right or left and the ailerons responded as opposites, causing the plane to bank and consequently to turn. It had a heavy wooden center pontoon and two metal wing floats.

My big moment came a few days later when Pierce called me for my first flight. The Burgess-Dunn had a nacelle which carried two seats in tandem with dual controls. Lieutenant Pierce directed me to the forward one, bawling instructions where to put my feet every step I took. Before climbing into the rear seat, he showed me how to fasten my safety belt. Directly in back of him at head level was the Curtiss OX motor, literally breathing

(Continued on page 81)

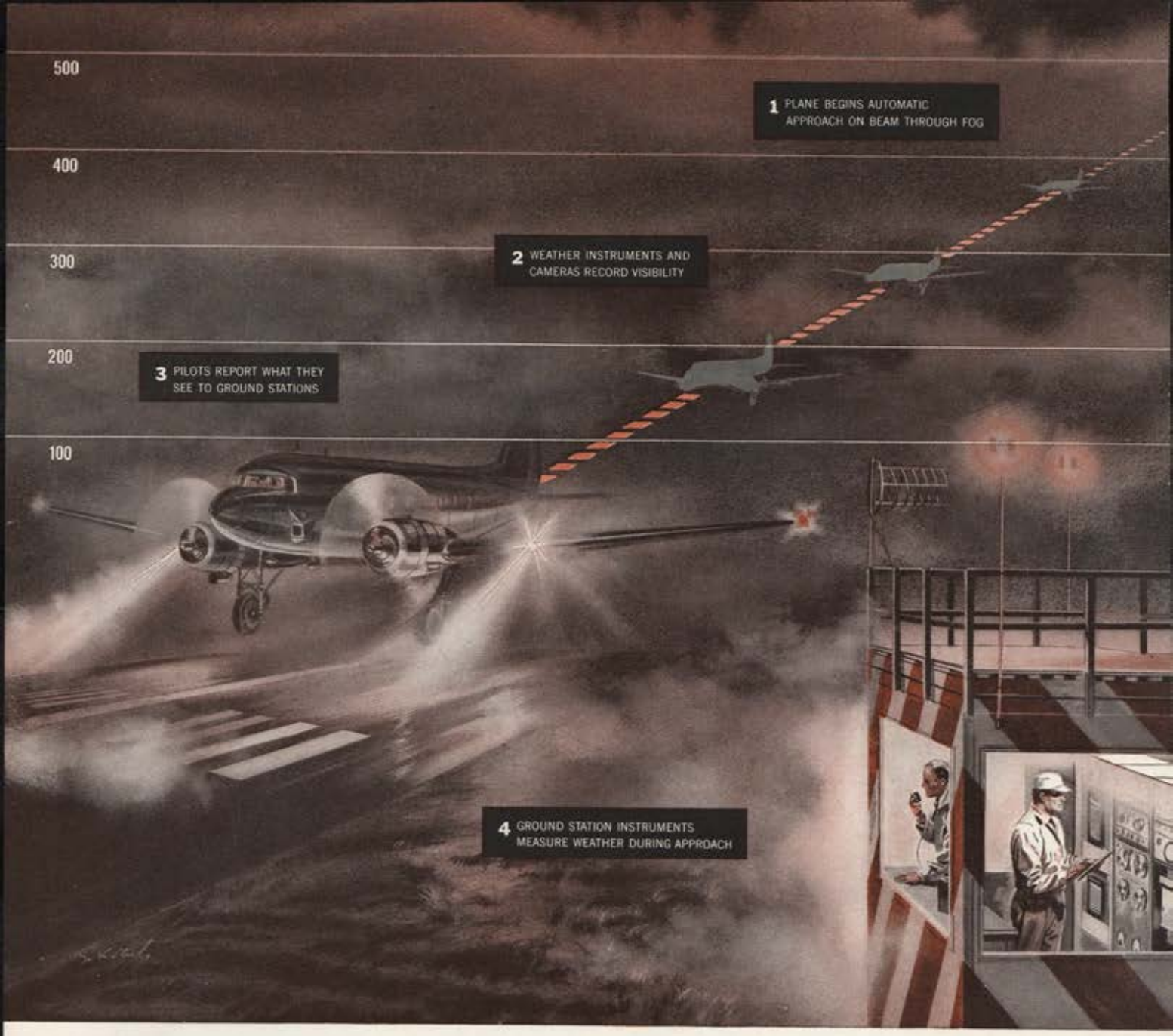
Now! Arma puts the plane on the map...

Arma's new Pictorial Computer shows a pilot his exact location and heading, continuously on a projected map—throughout a given flight. Here's how it works:

A film strip containing as many as 700 maps shows the various OBD stations over which the aircraft will pass. During flight, the Arma Computer automatically indicates position and heading of the plane on a TV-like screen. In other words, the Computer shows continuously and exactly where the plane is in respect to the ground, at every moment of flight—regardless of weather, altitude or speed. It automatically tunes to the appropriate OBD frequency, automatically adjusts for scale of map and has provisions for automatic chart changing.

Arma has worked closely with the Air Navigation Development Board and the Civil Aeronautics Administration in developing this Pictorial Computer for use in proposed advanced systems of air navigation and traffic control. For 35 years Arma has worked hand in hand with the Army, Navy and Air Force—and more recently with the Atomic Energy Commission—in developing important military control systems. *Arma Corporation, Brooklyn, N. Y.; Garden City, N. Y. Subsidiary of American Bosch Corporation.*

ARMA ADVANCED ELECTRONICS FOR CONTROL



Flying Lab makes 500 Landing Approaches in "Pea Soup"

THE STORY BEHIND THE STORY:

■ IF YOU'VE BEEN a passenger in a plane "stacked" above a fogged-in airport—or if you've been the pilot at the controls—you were certainly interested in headlines like the above appearing in newspapers a few months ago.

■ Behind those headlines is the dramatic story of men flying when "even the birds are walking," making landing approaches over and over again, to make your future landings safer in bad weather.

■ Working with the Air Navigation Development Board and the U. S. Weather Bureau, Sperry flight research personnel have completed 500 bad weather landing approaches in a flying laboratory equipped with specialized instruments. In flight, both manual and automatic recordings are made of conditions encountered during the final 500 feet of descent.

■ On the ground, trained observers report what they see, and monitor automatic instruments which measure ceiling and visibility conditions existing in the runway approach zone. Synchronized and analyzed, these records reveal the accuracy of the instruments and establish a wealth of information so pilots will know what weather to expect along the line of descent.

■ Because of its many years of experience in low ceiling approaches, Sperry was selected by the government to make the weather measurement study. This project is typical of the exacting flight research which is continuous at Sperry—flight research not only to perfect Sperry instruments and controls, but to advance the operational efficiency of both commercial and military aircraft.

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down his neck. It was idling spasmodically when Pierce waggled a short length of lead pipe under my nose.

"You're not to touch the controls this first time up," he shouted. "I want to see how you react to flying. And if you freeze onto them, I aim to hit you over the head with this pipe."

"Y-yes, sir," I stammered.

With that he gave it the gun, rocked the wheel violently for the next half mile, and finally pried the Burgess-Dunn off the water. After ten minutes of laborious climbing, we reached an altitude of five hundred feet. At six hundred the OX gave forth with a couple of uncanny snorts and quit. Down came the B-D in a dead-stick, fanny-busting landing that nearly rammed my spinal column up into my head.

Pierce mopped the sweat from his face with a rag tied to his helmet. His walrus mustache was twitching nervously.

"Close squeak, that, Keith," he said. "We're lucky to get down in one piece. I'll try to get you up again tomorrow."

But there was no "tomorrow" for the Burgess-Dunn. Pierce spun it in from a thousand feet that afternoon. Luckily it was a flat spin, so both he and his student lived, but the plane was demolished. When we brought the wreckage into the beach, even I, green as I was about airplane construction, was somewhat appalled to see common, every-day yardsticks serving as bracing in the wings. There was still lettering on them advertising somebody's paints!

As a result of Pierce's crash, the Bay Shore Naval Air Station went planeless for the next couple of months. But one day several huge crates arrived containing three tractor biplanes, all of different types.

The first one we set up was an N-9, the seaplane counterpart of the Army Signal Corps' JN-4D, their famous "Jenny" training plane. It was powered with a Curtiss OXX 90-hp motor. Next came a bulky plane known as an R-6. The fuselage was mounted on ponderous twin floats and powered with a 200-hp Curtiss V-2, one of the largest aircraft engines of its day. They were both pretty good kites.

Out of the third set of crates came the most lethal of all the flying coffins I was to pilot in the next few years. It was called an Aeromarine, later known variously as "Gyrene," "Killer Kite," and "Water Bitch." To outward appearances it was a normal, rather sporty looking plane, but hidden under the engine cowling was an anemic four-cylinder, in-line motor that was supposed to develop 80-hp. But it fell so far short that it literally took a hurricane to blow the thing off the water.

And once the Gyrene was airborne, it did unpredictable things. The first inkling we had of its eccentricities was when a student, with about three solo hours, put one in a glide preparatory to landing. For no explainable reason the Gyrene suddenly flipped over on its back and continued its glide upside down. Apparently the pilot's safety belt was too loose, as he slipped through it and came hurtling out of the cockpit. He fell two hundred feet to his death while the Gyrene, still on its back, glided to the water and the scrap heap.

On another occasion a student was flying a Gyrene solo when his bell bottom trousers jammed up the flipper wires, leaving him no vertical control over the plane. He wasn't experienced enough to attempt to bring it down to a crash landing with the motor by judicious use of the throttle. The Gyrene, being tail-heavy, climbed to a vertical stall. For a moment it hung there before the nose whipped viciously downward. My eyes fairly popped when I saw the whole engine snap clean out of the plane and go plunging to earth, propeller and all.

This Curtiss OXX-powered Aeromarine was an improvement on the original Gyrene with its anemic four-cylinder, in-line engine. This was the most lethal plane I flew.

Relieved of its weight, the Gyrene fell into a flat spin and crashed. The student wasn't killed, but one leg had to be amputated. Our opinion of the Killer Kite plunged to a new low.

The first time I went up in a Gyrene I was still learning to fly. When I reported, I found the instructor lolling in the after cockpit puffing a cigar—strictly against regulations.

He asked me only one question: "How much instruction time have you had?"

"Six hours, sir," I answered, "but none in a Gyrene."

"That doesn't matter," he said optimistically. "They fly like any other plane. Get in and take her off."

I did eventually after a prodigious amount of flipper rocking. When we were airborne at last, I glanced back. So help me Hannah if the instructor wasn't slouched down reading a newspaper and still smoking his cigar!

The same instructor turned me loose to solo a couple of days later. My first flight alone—it happened to be in an R-6—was the normal, dizzy exhibition. I got away with it, though, except for one unfortunate landing smack in the middle of a fish weir. In the ensuing melee the leading

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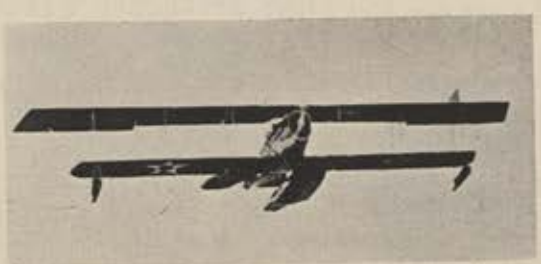
An N-9 takes off. This was the seaplane counterpart of the Army's famous training plane—the JN-4D, "Jenny."



edge of one wing got dented and I got three nights of extra guard duty on the graveyard watch.

After three hours of solo time at Bay Shore, I was transferred with several others to Miami, Fla., then a town of about 7,000. There I found as little evidence of an air station as I had at Bay Shore. There was a big one under construction at Dinner Key about five miles south of town, but it would be another month before we could operate from there. Meanwhile we lived in the Fair Building, a wooden structure built out over Biscayne Bay at the foot of Miami's main street. Our flight beach, on the grounds of the nearby Royal Palm Hotel, boasted two wooden ramps and nothing else.

When I arrived, we had two R-6s. Two days later we had only one. I cracked up the other in a fog—my only crash in twelve years of flying.

The ground mist was solid enough to chew on when I came down to the beach about daybreak that morning.

"We get this often in the early morning," explained Ensign Thorne Donnelly, in charge of the beach. "Get above three hundred feet and you're out of it. Your turn to go up, Keith. Think you can make it?"

"I guess so," I answered with no enthusiasm whatsoever.

The minute I left the water everything tangible disappeared—even my wing tips. I began to feel damnably lonesome. We flew by the seat of our pants in those days for the simple reason we had no instruments. On the panel in front of me was an oil gauge, a tachometer, and an altimeter, period. No bank-and-turn or rate-of-climb indicators and no airspeed gauge. If the wind hit you straight in the face, you knew you were doing all right. If it fanned you on one cheek and not the other, you could be sure you were lousing things up somewhere.

About two minutes after taking off the wind stopped hitting me at all, and the controls failed to respond no matter which way I pushed them. The R-6 began whipping around in circles. I knew I was in a spin, but nobody had ever told me what to do about it. Seconds later the plane hit the water, something hit me, and I passed out.

When I came to I was hanging face down on my safety belt with the water directly below me. The after part of the fuselage, with me in it, had cracked off and was curled over the rest of the plane like a scorpion's tail. I had a lump on my head and my nose was squashed, but nothing else seemed to be broken.

Being sort of muddled, I unsnapped my safety belt and dropped smack into the water. I could touch bottom, which was some consolation as I knew the wreckage could not sink. So I climbed up on a battered wing and sat there for what seemed like a couple of decades. Finally a lone-lung motorboat hove in sight out of the fog with two men in it. They took me abroad and back to the Fair Building.

A few days later somebody hung our remaining R-6 in a clump of coconut palms and we were planeless again. But shortly afterwards we moved out to the new Dinner Key Naval Air Station and planes began to arrive by the carload.

From then on I rolled up flying time in a hurry. When I had accumulated the required twenty-five hours of solo, I passed a series of flight tests and got Naval Aviator Certificate No. 379, a pair of brass wings and a commission as ensign. The next day, with a total of thirty-six hours in the air, I became a flight instructor!—END

The author is Frederick W. Keith, who wrote "Musty Planes and Vintage Pilots" for us in January. He's a retired Navy commander and now lives in Florida.—The Editors.

FRIEND or FOE? *How many? How far? How fast?*

Time: 0314, on a U.S. Aircraft Carrier somewhere on the high seas. Wind 44 knots; visibility zero. And, somewhere out there in the fog are four "objects"—either as friendly as a neighbor's puppy or as deadly as a rattlesnake!

In a situation like this, somebody has to find all the answers—but quick! With 3,000 lives at stake and a hundred million dollars worth of equipment riding the waves, split-second identification of "what's out there," is a *must.*

They used to do the job with a half-frozen observer in the crow's nest, a megaphone and a handful of men on a spray-lashed bridge. Today, a crew of skilled technicians sit in the scientific maze of a modern Combat Information Center and call on Electronics to do the job. The mere flip of switches is enough to *see* what's ahead, identify its character, distance, and speed, and if necessary, alert the entire company through the intercommunication system and bring full fighting power to life.

This is "shipboard radar." A simple phrase for some of the most fantastic electronic equipment of our age. We at Stromberg-Carlson helped in its development and today provide to the armed forces many of its most important component parts. Thus the same engineering skill which, 60 years ago, harnessed Sound and Electricity for better communication methods still weds the pair to help preserve our national security.

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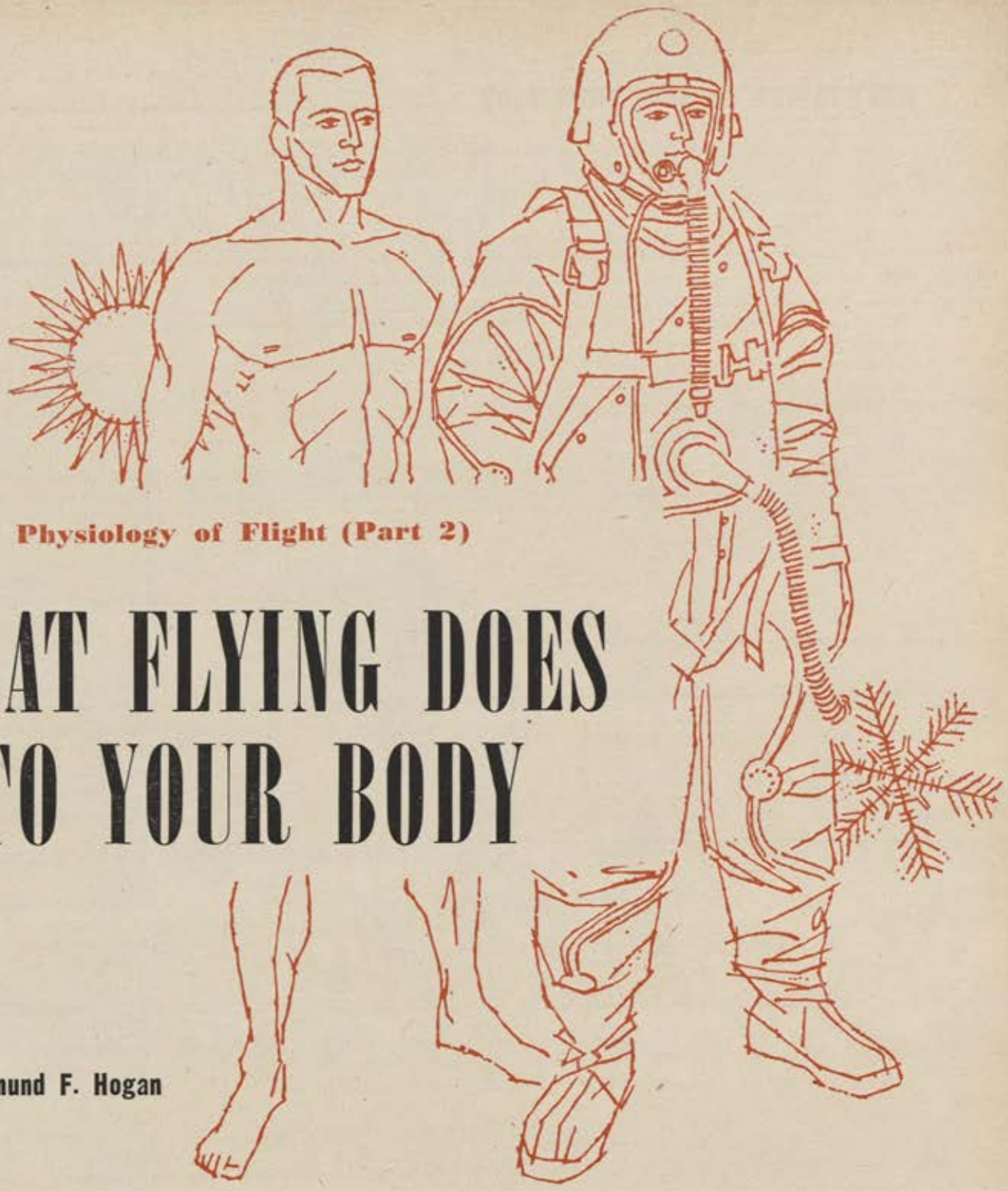


Physiology of Flight (Part 2)

WHAT FLYING DOES TO YOUR BODY

By Edmund F. Hogan

Without aero-medicine to whip the problems flight imposes on human bodies, we'd have long since reached the limits of manned aircraft

ORVILLE and Wilbur Wright did not foresee the scope of what would follow in the wake of their first controlled powered flights at Kitty Hawk on December 17, 1903, nor could they have been expected to. A whole new industry has sprung up and its by-products are seemingly endless.

Now airports receive major consideration from civic planners. Transportation of goods and services is beginning to be keyed to the air. Even the sciences have been affected. In fact, in one field a new science has been born—the physiology of flight.

As man created machines capable of flying higher, farther, and faster, he began to notice dynamic changes in his own body. Aero-medical research was created to find answers for pilots who experienced "graying out," sluggish reaction in handling controls, shortness of breath, and a

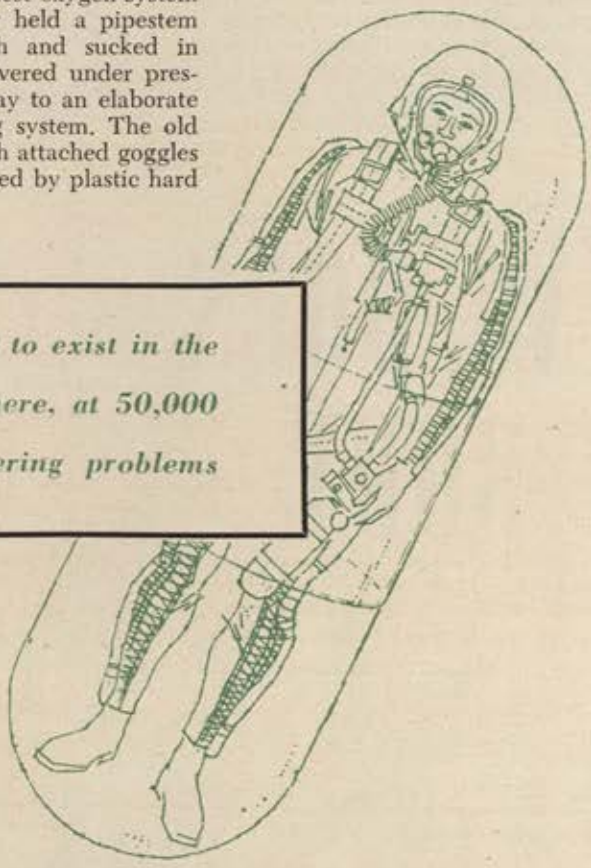
(Continued on the following page)

variety of other symptoms, including cramps and pains.

The scientists who deal exclusively with the human body soon learned that flyers needed such outside help as oxygen and pressurized equipment so their bodies could make the adjustments demanded by aviation.

In the last ten years these demands have become increasingly insistent, requiring continuous refinement and improvement of the physical aids. The earliest oxygen system —in which a flyer held a pipestem between his teeth and sucked in oxygen being delivered under pressure—has given way to an elaborate pressure breathing system. The old leather helmet with attached goggles has been superseded by plastic hard

Man, designed to exist in the earth's atmosphere, at 50,000 feet faces staggering problems



hats resembling football headgear. Old coveralls no longer suffice as the cockpit uniform for a modern high-altitude flyer. His clothing must provide warmth, yet without vast bulk to hinder his freedom of movement.

In the offing are aircraft that will perform at altitudes above 50,000 feet where the problems of survival alone are staggering. Physiologists themselves admit that their attentions, heretofore directed to what happens in the atmosphere, have broadened to include problems related to space itself.

Man was designed for existence in the earth's atmosphere. Yet at 50,000 feet only twelve percent of the protective effect of the earth's atmospheric blanket remains. He begins to be bombarded by cosmic radiation. Very high energy particles are encountered, weighing as much as calcium atoms and able to penetrate human tissues. Physiologists, acutely aware of the problems involved in flying at altitudes above 50,000 feet, have made important discoveries.

Of radiation, they have learned, for example, that aircrews can operate regularly over prolonged periods, as long as twenty-five hours a week at altitudes to 60,000 feet without suffering harmful effects.

If pilots of the future look like men from Mars when they climb into a cockpit, there will be good reason. At 44,000 feet, the maximum pressure applied to the oxygen mask cannot guarantee that it will not leak around the nose and mouth. Even if greater pressure could be applied to flexible rubber face-sealing masks such as the A-13, no useful purpose would be served.

Increased pressure around the mouth and nose would push up the internal pressure, causing ear membranes to bulge and building up tension in the eyes. The result would be severe pain in the ears and eyes, and few flyers would be able to stand the discomfort for any length of time. Higher breathing pressures require completely new approaches to the problem. Much work has been done in this direction, and the answer of how to keep the pilot inhaling and exhaling in the region between 45,000 and 60,000 feet has been found at least partially in the development of high-pressure breathing helmets.

Yet the helmets alone will not protect the flyer. When the pressure which delivers oxygen to the nasal passages is increased, so also is the pressure within the lungs. Therefore, the chest wall must get additional support or the lungs will burst like an over-inflated balloon. One technique is to place a bladder over the chest and abdomen. This is the simplest device but not the most practical, since pilots have difficulty bending or moving about while wearing it.

One alternative is a tight, elastic nylon vest. Very high breathing pressures can be applied to a flyer who wears the vest and, although he will have some trouble breathing, he can build up tolerance by gradually increasing the time the vest is worn.

The special helmet and elastic vest will make an important contribution to the flyer's survival up to 60,000 feet. Meantime, pressure suits are getting considerable attention. The full pressure suit is really an adaptation of the underwater diving suit to high altitudes.

But the full pressure suit has certain drawbacks. In the first place, it must be worn zipped up with the hands encased in gloves. Keeping all parts of the body, including the hands, shielded in an airtight layer poses a serious problem in internal ventilation.

The need for a close fit to give flexibility has introduced other problems, for compromises must be made with the pilot's need for protection against cold if he has to bail out or if he lands in cold water. So heavy clothing must be worn under the suit. This implies that the suit must fit fairly loosely. So physiologists have encountered technical difficulties in compromising between the conflicting requirements of altitude and protection against environmental temperatures.

For this reason researchers are beginning to think more highly of the partial pressure suit, a closely fitting garment made of porous non-elastic nylon fabric. Across the back and down the outside of the arms

and legs are inflatable tubes which attach to the suit by means of crossing tapes. When the tubes are inflated, the tapes are shortened, the suit becomes skin-tight and pressure is applied to the surface of the body. The suit can be worn under ordinary flying clothing. An independent ten-minute supply of oxygen with regulators and connections is available for emergency descents or for bailing out. In addition, the suit inflates automatically whenever the aircraft cabin altitude is above 43,000 feet.

Future altitude suits will probably incorporate the best features of both the full and partial pressure suits. Physiologists are certain that, although the gear may make the flyer look like that man from Mars, it will not restrict his movements and it will function satisfactorily in emergencies. They are certain, too, that this equipment can be worn together with the crash helmet, anti-G suit and survival and flotation gear with little loss of efficiency.

It is probably true that discussions of studies being made in the physiology of flight tend to stress the research pointed toward future operations, at the expense of what is being accomplished to help flyers today. Although they must plan for the future, these scientists are not overlooking the present. In this connection, physiologists are making extensive studies into the problems of vision and the effects of noise and altitude on hearing.

Man's eyes are his most important asset in flying. Vision tells a pilot where he is, whether he is flying contact or on instruments. Good depth perception is needed for safe take-offs and landings. The pilot must have sharp eyes to spot enemy planes and targets, color vision for identifying signals, and night vision for effective night operations.

It may come as something of a surprise to flyers to learn that there is a physiological reason for keeping windshields and glasses clean. Particles of dirt and grease scatter light haphazardly into the bundle of rays that form the image of an object on the eye's retina. This decreases contrast and destroys the sharpness of the image, thereby lowering visibility.

As flight altitudes increase, there is less haze, the sky becomes darker, and the sun's rays contain a higher proportion of ultraviolet light. Physiologists decree the wearing of sunglasses as essential at high altitudes for protection against ultraviolet radiation and increased intensity of light.

Hearing is equally important. On any mission, communication is essential—between airplanes in flight and between an aircraft and the ground. And in modern, high-speed aircraft accurate communication becomes more necessary than in the past because there is rarely time to "say it again."

Aircraft communication is difficult at best because of engine noise, low barometric pressures at altitudes, and complex protective equipment worn by air crews. Researchers are working toward developments which may include such items as improved and more comfortable noise shields for headsets, higher fidelity in amplyfying speech, better performance from microphones and earphones at all altitudes, and oxygen masks which require less effort for breathing and speaking.

Even with these improvements the relationship between the speaker and the listener will remain the key to an effective communications system. Physiologists, therefore, propose that those directly concerned with aircraft communication constantly practice those listening and speaking techniques that will improve the value of the system. In particular, they urge pilots to be certain that noise shields are firmly in place when headsets are worn and, to guard against ear fatigue, they recommend that aircrew members keep their ears

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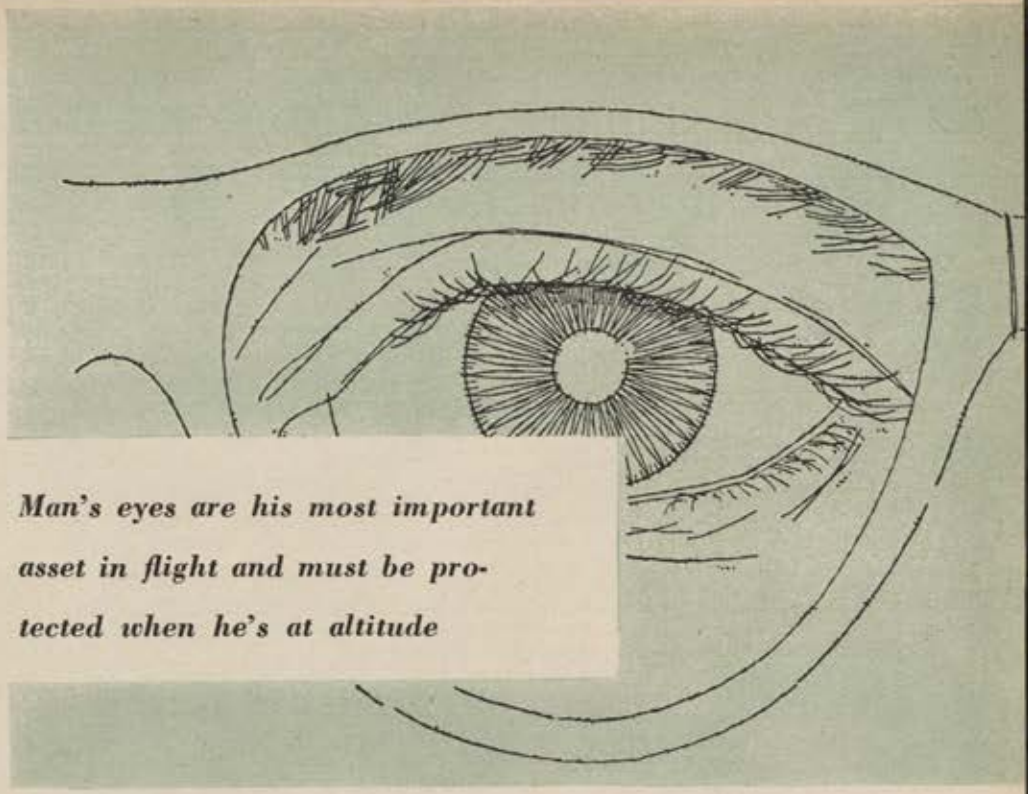
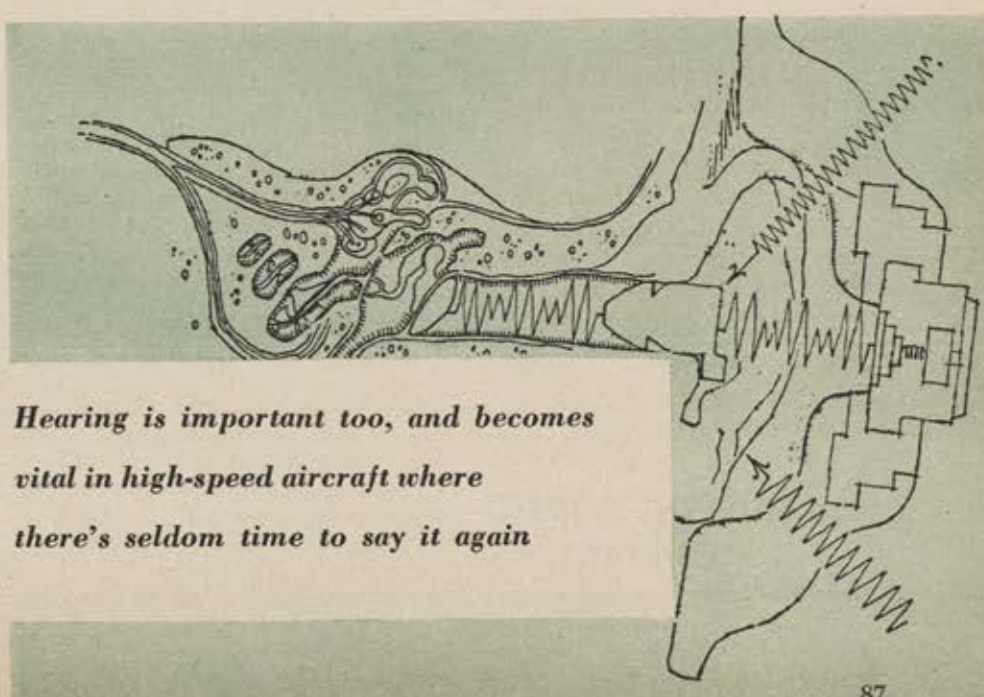


Man's eyes are his most important asset in flight and must be protected when he's at altitude



Hearing is important too, and becomes vital in high-speed aircraft where there's seldom time to say it again

WHAT FLYING DOES TO YOUR BODY — CONTINUED

plugged or covered by a headset, both in noisy aircraft and on the line when engines are operating.

Another high-speed problem is that of human tolerance to acceleration forces. Aviation medicine speaks of the forces produced by acceleration in terms of "G." As the term is commonly used, the weight of an individual is the force in pounds created by gravity or one G, acting on the mass of the person's body. When a pilot pulls five Gs, it means simply that he is exerting a force against the seat of the plane of five times his normal weight.

There are ways to increase tolerance to G forces. One is by straining both leg and abdominal muscles. Another involves bending forward at the hips. Although this posture hunches the pilot over the controls and probably induces some back strain, it produces a significant increase in tolerance of between two and three Gs. But the best solution is to wear an anti-G suit.

One type, the G-3A, which applies pressure to the abdomen and the big muscles of the legs, is designed to be worn over clothing. It increases tolerance by one G but is less effective than the G-4A suit, which consists of single pneumatic bladder system sewn into a flying suit and which affords a two G protection. The G-4A is equipped with concealed lacings down the legs so that it can be fitted accurately. It is made of nylon and cotton. The nylon gives it strength and durability, and the cotton increasing porosity.

Anti-G suits are the highest fashion. At left, the G-3A. At right, G-4A.

An understanding of G forces is important because the modern airplane can withstand higher G loads, for a longer period of time, than the human body. An airplane wing, stressed to accept a seven and one-third operational G load, can handle this force indefinitely without failing. In fact, about four Gs more are available for emergency use before the wing will buckle. Not so humans.

By and large, relaxed subjects undergoing tests on the centrifuge "gray out" at three and a half to four Gs. In this condition circulation through the eye becomes feeble and an inadequate supply of oxygen reaches the light sensitive cells of peripheral vision. At accelerations from four to four and a half Gs, the subjects usually black-out and between four and a half and five Gs, they normally lose consciousness.

Anti-G suits will not raise human tolerance to acceleration above the stress limits of modern fighter aircraft. They merely match the man to the machine. The anti-G suit, say the physiologists, sometimes gives the pilot a sense of false security. So they remind him to be constantly alert for the sense of increased weight transmitted from the pressure of the seat, the increased load of the arms, and the dragging-down feeling

(Continued on page 91)

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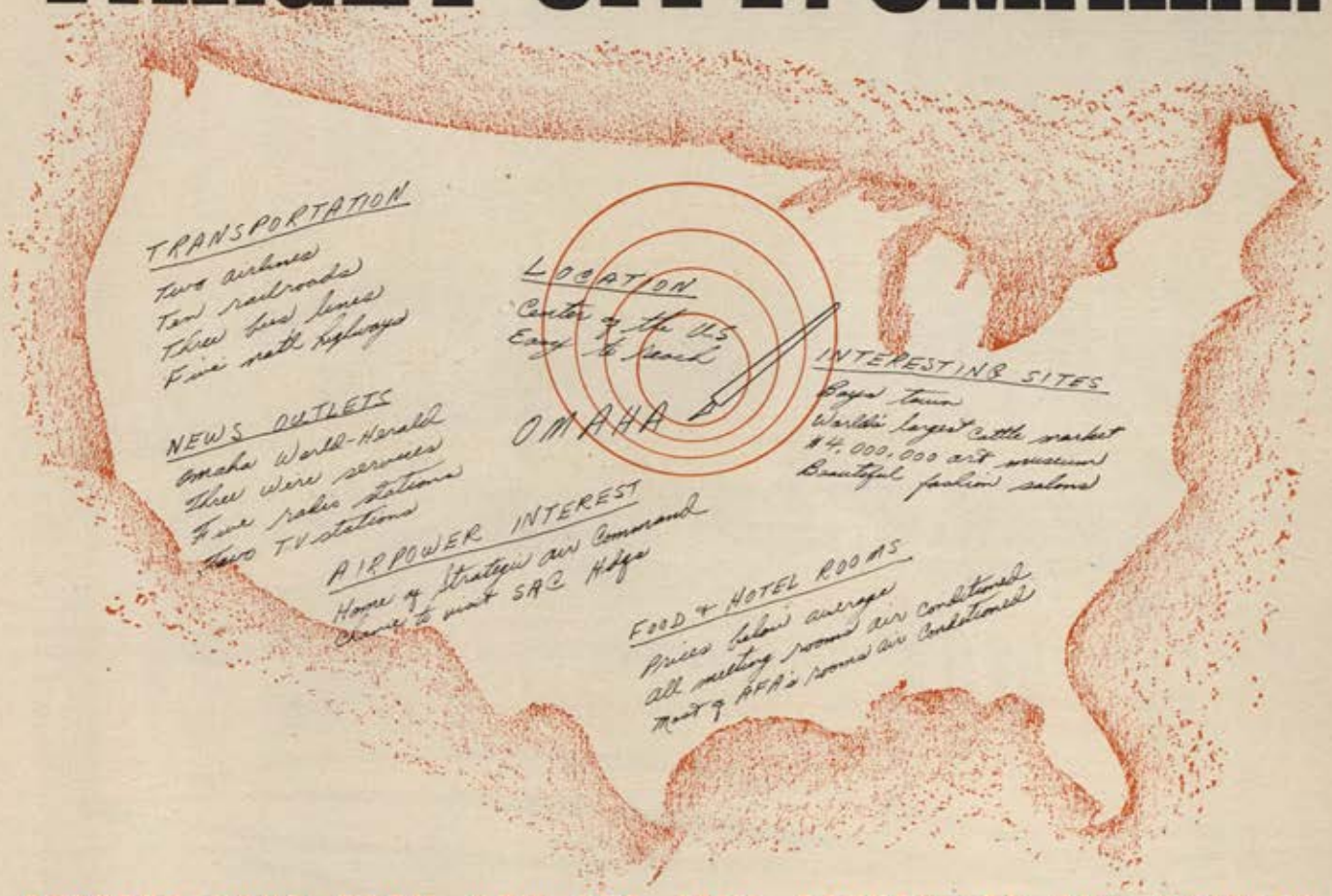

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of the face. These are signs that the body is approaching its maximum tolerance to G forces and the load should be reduced before blackout and unconsciousness set in.

There is a sound reason for warning against lengthening the duration of high G loads. The body is capable of standing up under very high gravitational forces for brief periods of time. For example, a pilot who ejects from a disabled fighter is subjected to a force of about twenty Gs at the instant the seat fires. But this lasts only a fraction of a second before the G load revises itself downward. A twenty G load applied to the body for several seconds would prove fatal.

As the speed of aircraft continues to rise, the problems connected with seat ejection will mount. Already, to insure that a pilot will clear the high tail structures of the B-47 and B-52 bombers, the explosive system which fires the seat has undergone a tremendous increase in power. Some future aircraft will have to have downward ejection seats. This will minimize the possibility of striking the aircraft, a hazard always present during upward ejection at speeds in the vicinity of 600 miles an hour. But it also will require new types of shoulder and seat harness that will guarantee even distribution of high G loads over the body.

Ultimately, physiologists look for a pod or capsule type of ejection—the logical means of overcoming effects of wind blast and the hazards of cold and lack of oxygen. The big disadvantage is that the pilot would be subjected to high gravitational loads for a relatively long time. But the advantages are many. Emergency pressure oxygen equipment built into the pod would increase the chance of survival over that of ejection into the wind stream. Further, capsules could be equipped with parachutes and emergency kits, thereby relieving the pilot of much of the cumbersome gear now required.

Whether it be the G forces imposed upon a flyer during an ejection seat bailout, studies of body size and muscle strength in a continuous effort to improve the flyer's comfort in the aircraft, or dietary habits aimed at eliminating stomach distress at altitude, aviation physiologists press their research into this new science.

The results to date have been impressive. The machine has not completely outdistanced man. And if the past presages the future, physiologists can keep Joe Doakes in the cockpit for a long time to come.—END

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