JULY 1957 / 35c

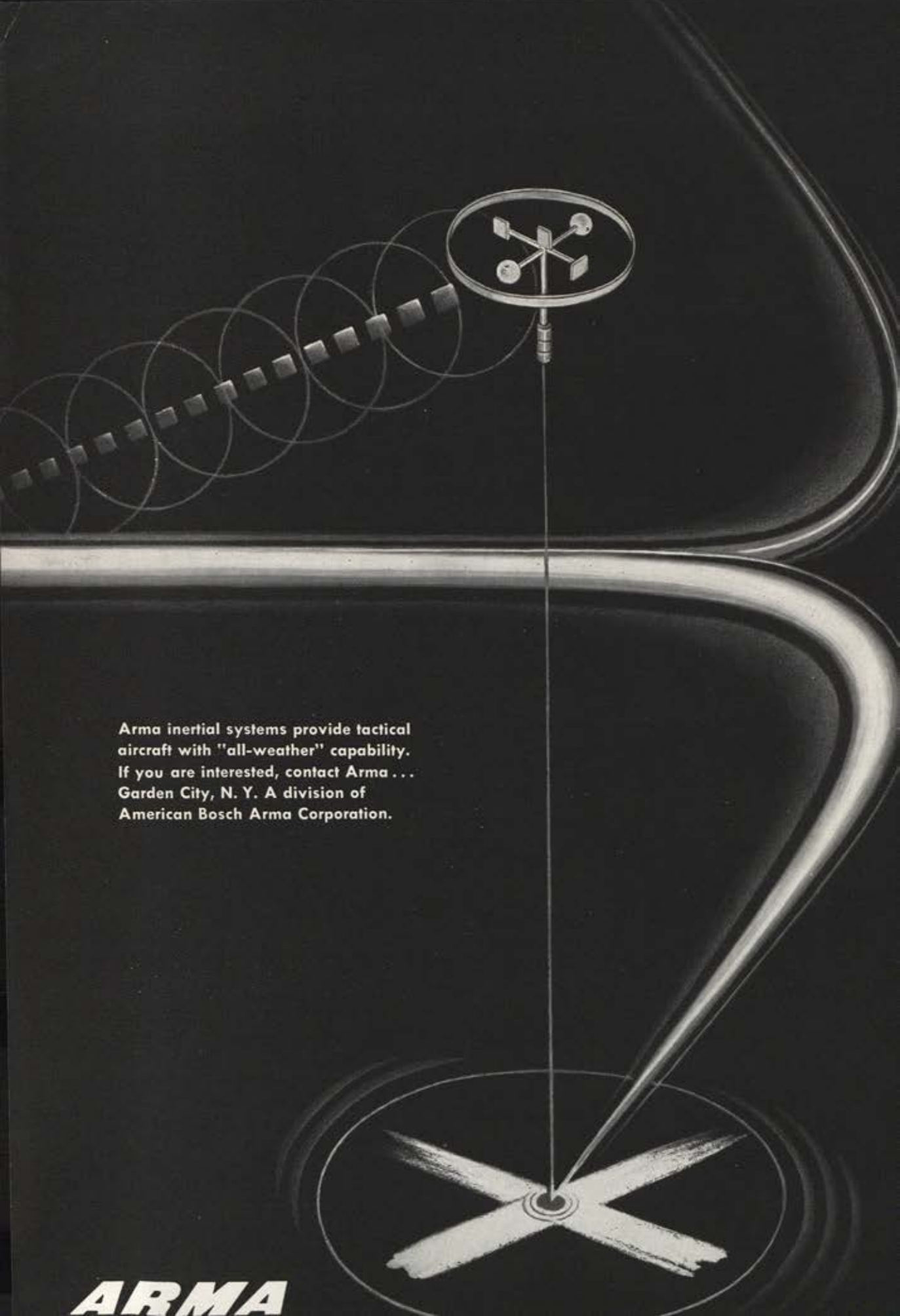
AIR FORCE

• The Magazine of AMERICAN AIRPOWER / Published by the Air Force Association

Milt Caniff's Air Force

ALSO IN THIS ISSUE:

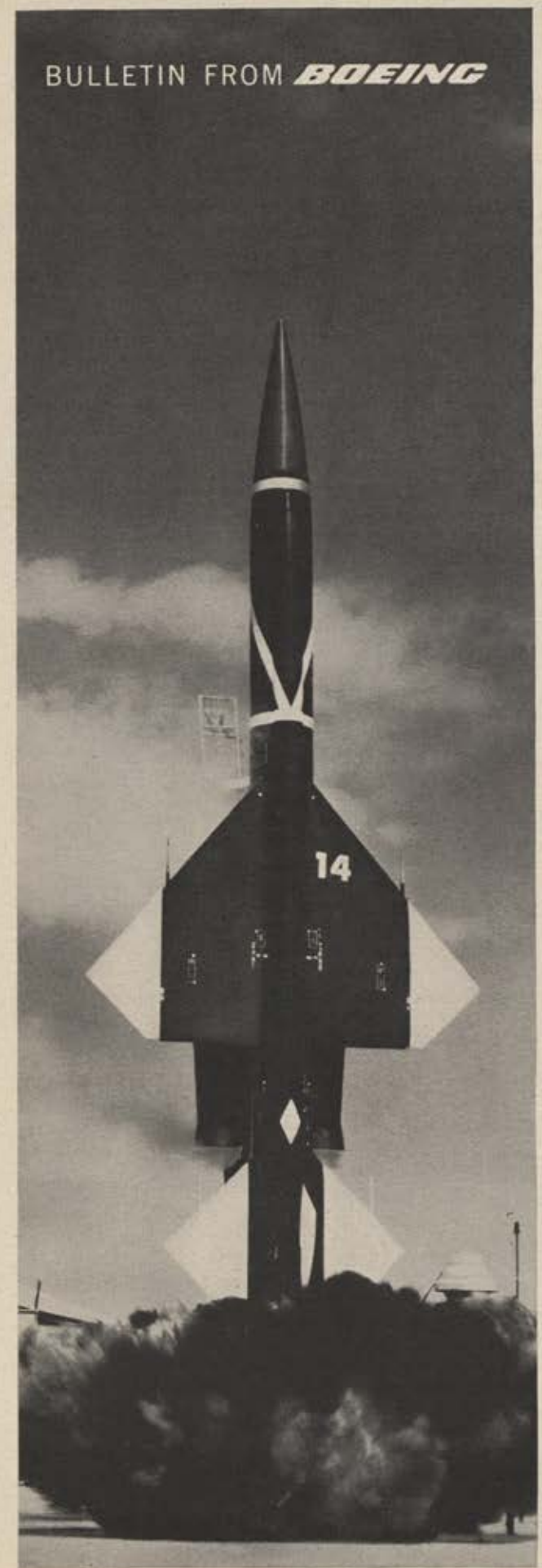
New Muscle for the Long Arm of SAC • Cold Baths for 'Hot' Aircraft



Arma inertial systems provide tactical aircraft with "all-weather" capability. If you are interested, contact Arma . . . Garden City, N. Y. A division of American Bosch Arma Corporation.

ARMA

BULLETIN FROM **BOEING**



HURTLING through the sky at supersonic speed, Boeing's Bomarc IM-99 interceptor missile is equipped with an electronic guidance system that keeps it on an interception course with the target.

Newest weapon for America's defense—

the Boeing Bomarc interceptor missile

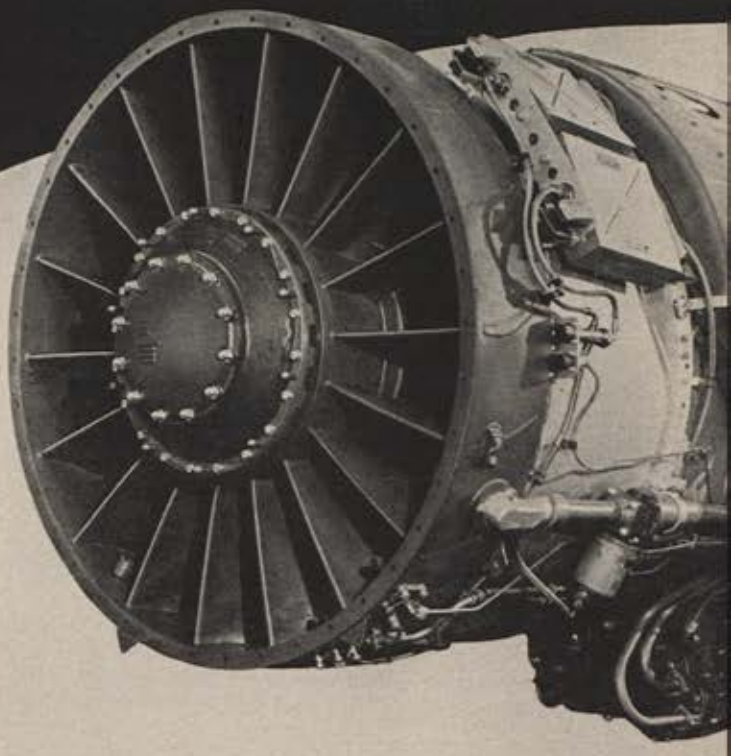
An advanced weapon is being added to the defense arsenal of the nation. The Bomarc IM-99—designed, developed and now being produced by Boeing for the Air Force—is a supersonic missile capable of operating at extreme altitudes.

Bomarc will greatly extend the reach of America's defenses. Superior range enables this missile to shoot down enemy aircraft while still over areas well away from vital targets. Bomarc is an "area" defense weapon as contrasted to short-range anti-aircraft missiles, which are "point" defense weapons.

In addition to the missile itself, Boeing has responsibility for the complete Bomarc weapon system, including launching means, bases, supplies, communications and electronic guidance. Bomarc will be operated by the Air Defense Command.

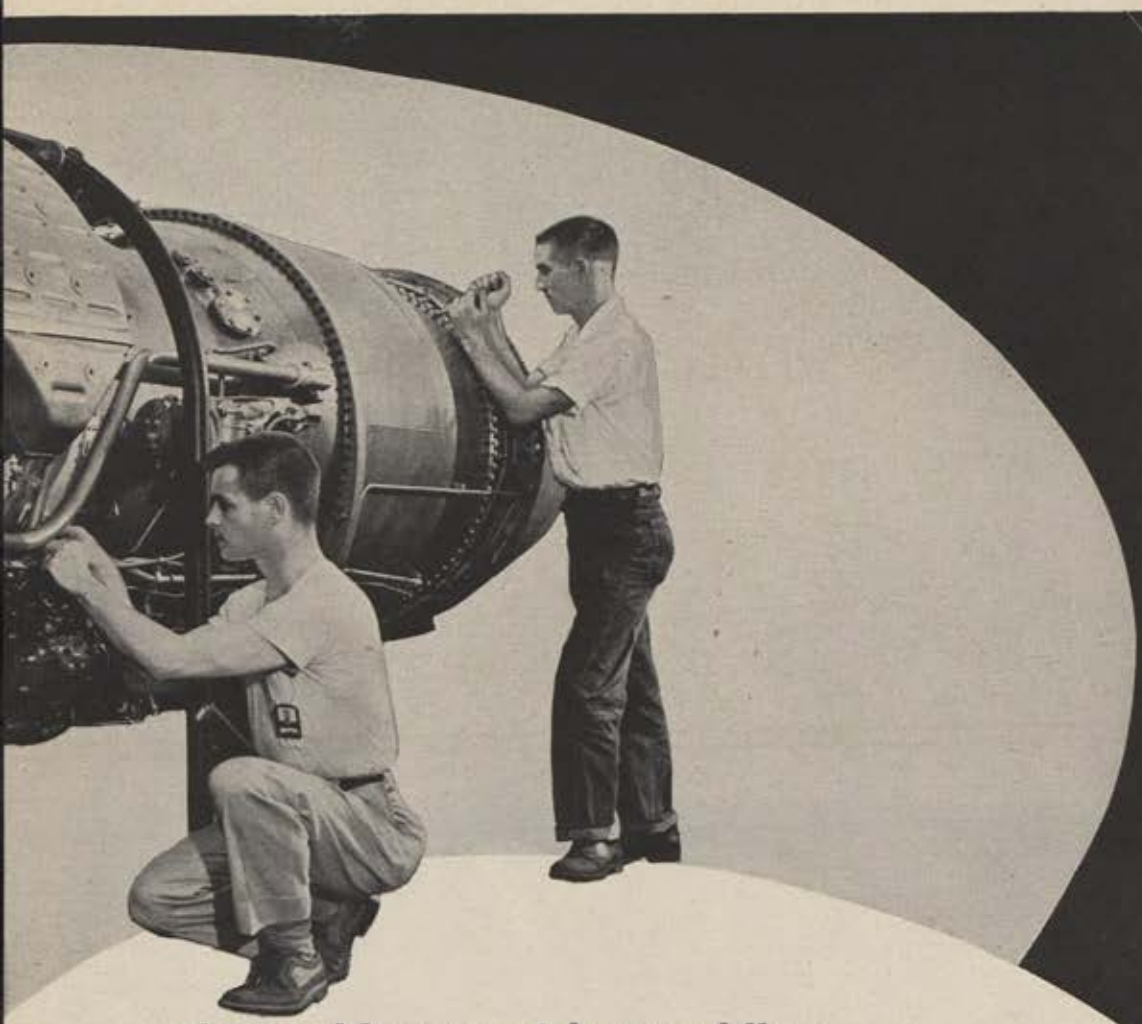
LEFT. A Boeing Bomarc in firing position. The missile is launched vertically by a liquid fuel rocket motor. When suitable speed is reached, the rocket cuts out and two ramjet engines take over to provide power for supersonic cruise speeds.

BOEING



MOST POWERFUL

Jet engine in production—the J-75



another achievement in providing AIRCRAFT POWER—in whatever form it takes

The free world's most powerful production turbojet—Pratt & Whitney Aircraft's J-75—is a major advance in the science of aircraft propulsion.

Producing about 50 per cent more thrust than the famed J-57, its forerunner, the J-75 is in the 15,000-pound thrust class. Its power can be greatly augmented by use of an afterburner.

The J-75's basic configuration stems from the J-57's axial-flow design, which features simple, permanently fixed stator vane construction. Despite its 50 per cent increase in thrust, the J-75 is only slightly larger than the J-57, with a lower specific weight and outstandingly low specific fuel consumption.

Already announced as the power plant for the Republic F-105 fighter for the Air Force and for production models of the Navy's Martin P6M seaplane, the J-75 will also power other Air Force and Navy high performance aircraft still on the classified list. Its commercial version, the JT4, will power a majority of the Boeing 707 and Douglas DC-8 jet airliners ordered by the world's leading airlines, while others will be powered by the JT3, commercial version of the J-57.

Quantity production of the J-75 again demonstrates that—whatever form the future takes—Pratt & Whitney Aircraft is prepared to offer continued advancement in power plant design and production.

Pratt & Whitney Aircraft

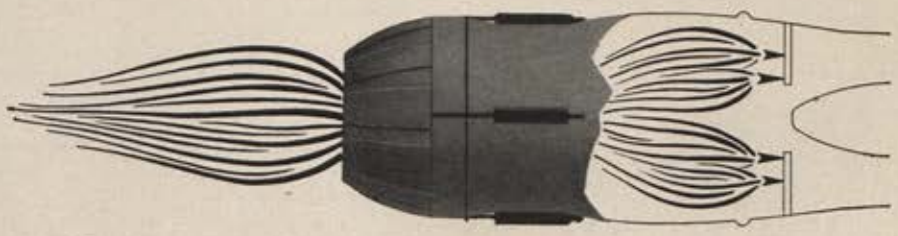
Division of United Aircraft Corporation, East Hartford, Connecticut

CONNECTICUT OPERATIONS—East Hartford

Major Branch Plants—Meriden, North Haven, Southington

FLORIDA OPERATIONS—West Palm Beach

FIRE!



Starter! Pressurized! Fire!

And another J57 jet engine tunes up in one of our test cells. To look at that big monster belching flame with a rhythmic whine you'd think all production jobs on it were finished. After this testing, it should be merely a matter of a careful final inspection before shipping this jet engine.

But *this* is where we start all over again. Every J57 engine is built, tested—*then torn down completely and inspected.* The engine is then rebuilt and given a final testing. Only at this point is it ready to be submitted for acceptance. This is the way these engines are built.

Admittedly this is a very careful process—but it's the way of making sure these Ford-built engines do everything expected of them, under all conditions.

These J57 jet engines *must* be dependable—a lot of people are depending on them.

AIRCRAFT ENGINE DIVISION • FORD MOTOR COMPANY

7401 SOUTH CICERO AVENUE • CHICAGO 29, ILLINOIS

AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

Volume 40, Number 7 • July 1957

STAFF

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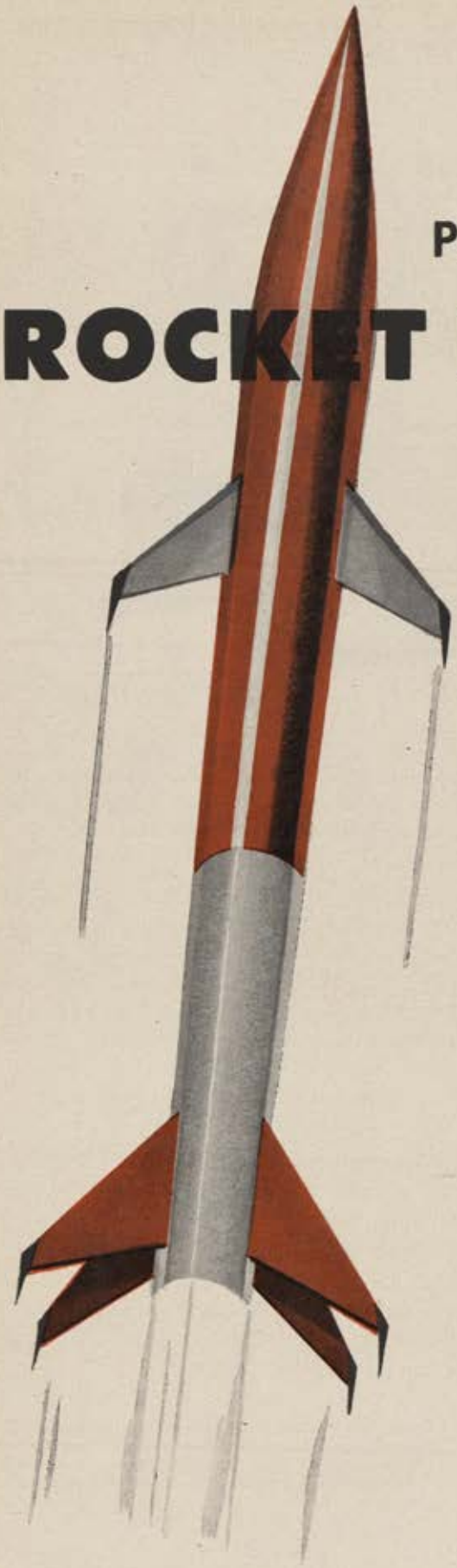


Phillips Cuts the Cost of

ROCKET PROPULSION

with low cost PETROCHEMICAL INGREDIENTS

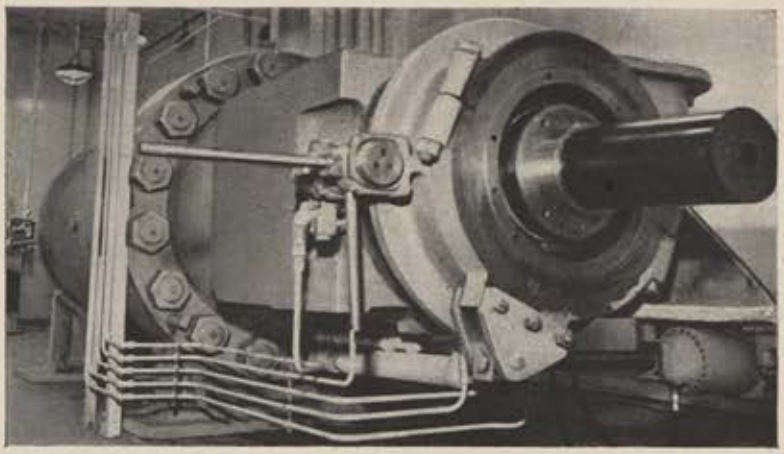
Phillips Petroleum Company has made an important contribution to the economics of rocketry by developing a series of powerful, *low cost propellants* from readily available materials. The Phillips operated Air Force Plant 66, near McGregor, Texas, provides complete facilities for designing, developing, and testing solid rockets and propellants. You are invited to discuss your problems in propulsion systems, primary rockets, booster rockets, and related matters with our staff of skilled scientists and engineers.

Rocket Fuels Division

PHILLIPS PETROLEUM COMPANY

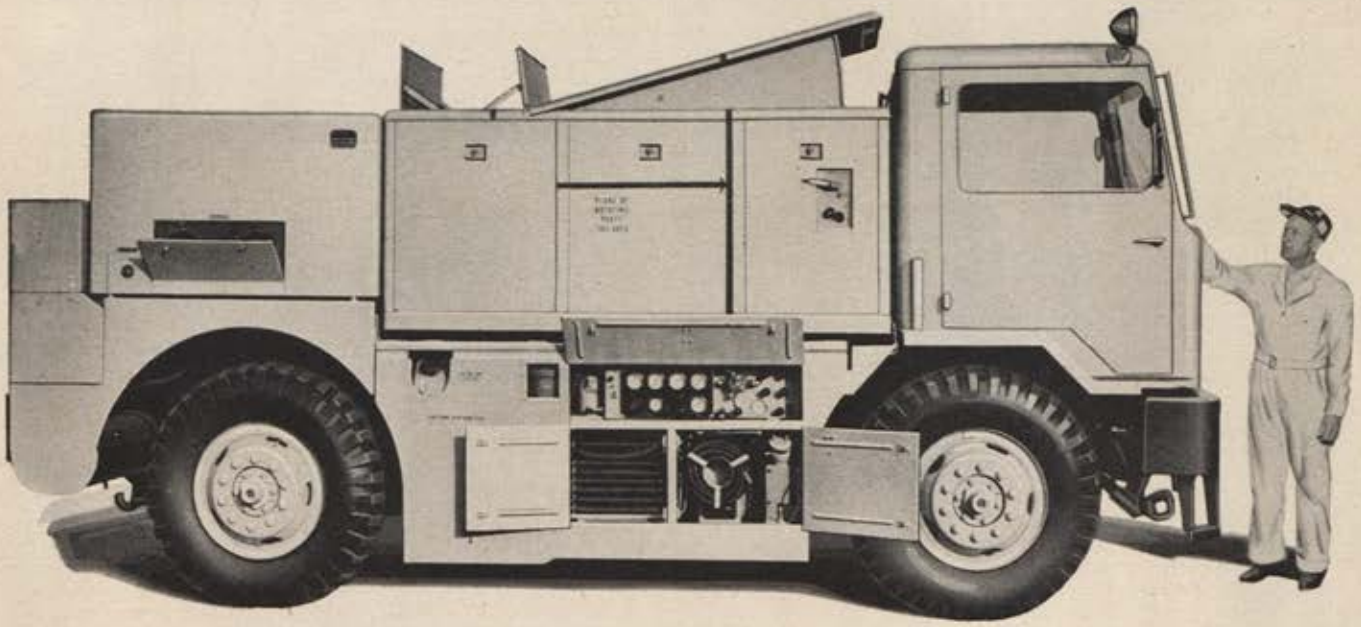
Bartlesville, Oklahoma

Phillips 66



Giant extruders form solid propellants that are easily handled and can be stored for long periods.

CAPABILITIES . . . Manpower, Tools and Experience



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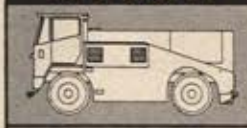
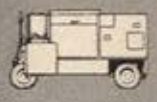
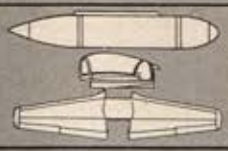
	MA-3 MULTI-PURPOSE VEHICLES
	C-26, MD-3 POWER UNITS
	TANK-WING-MAJOR SUBASSEMBLY SUBCONTRACT PRODUCTION
	BEECHCRAFT T-34 TRAINERS
	BEECHCRAFT L-23 TRANSPORTS
	4-PLACE BEECHCRAFT BONANZA
	6-PLACE BEECHCRAFT TWIN-BONANZA
	8-PLACE BEECHCRAFT SUPER 18

No other ground support unit offers the complete flexibility and "fast starting" action of the Beechcraft MA-3 Multi-Purpose Vehicle, now entering service with the U. S. Air Force.

The MA-3 has 12,500 pounds draw-bar pull for towing aircraft, which can be increased by adding to its gross weight. It has reciprocating and gas turbine power plants, an air cycle type air-conditioner of 13-ton capacity, high pressure air compressor with capacity of 15 CFM of free air at pressures up to 3500 PSI. The vehicle can travel at 45 mph, maneuvers easily, has four-wheel power steering, four-wheel drive and four-speed torque converter transmission (four speeds forward and two reverse).

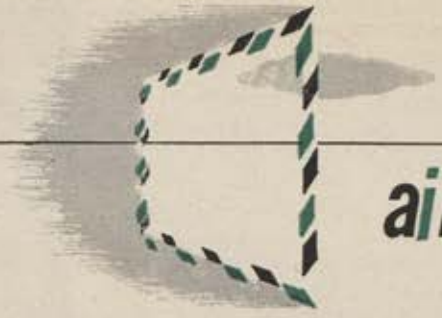
The MA-3 provides 28 Kilowatts direct current from two self-cooled 500 ampere 28-volt generators; features split and single bus; has three-phase alternating current 60 KVA-45 KW; and a self-cooled alternator, precisely controlled frequency 400 CPS.

Unexcelled in-the-field service by thousands of Beechcraft ground power units and a world-wide service organization add to the advantages of this truly exceptional unit.

Inquiries from airlines, manufacturers, and others who desire details of the most advanced and modern ground support unit will be welcomed by the Contract Administration Division, Beech Aircraft Corporation, Wichita 1, Kansas.

Beechcraft

BEECH AIRCRAFT CORPORATION, WICHITA, KANSAS, U. S. A.



air mail

Father and Son

Gentlemen: In your May issue, in the article about Dyess Air Force Base, you said that Brig. Gen. Charles B. Westover, Commander of SAC's 819th Air Division, was "no kin" to Maj. Gen. Oscar W. Westover, for whom Westover AFB, Mass., was named. I believe they were father and son. Will you kindly straighten me out on this?

Natalie N. Hodgson
Hanover, N.H.

● *We were wrong—Maj. Gen. Oscar Westover was the father of Brig. Gen. Charles Westover. The elder Westover, at the time of his death, September 21, 1938, was Chief of the Army Air Corps, and was succeeded as head of the AF by then Brig. Gen. Henry H. Arnold, who became the famed wartime leader of the Air Force. Gen. Oscar Westover was killed in an air crash near Burbank, Calif., after flying from New York to attend air maneuvers in connection with an American Legion parade in Los Angeles.—The Editors.*

Antique Airplanes

Gentlemen: I am sending you a late issue of *Antique Airplane News*. Although our membership isn't large nor our monthly magazine in wide circulation (3,000), I think that many of your readers will be interested in our work.

The Antique Airplane Association was founded in September of 1953 to stop the destruction of old aircraft and to start a definite program to not only save such aircraft but to restore and fly them. This is the main basis of our activity, although aviation history and its many activities are also very important to us. The past year has seen a tremendous increase in locating and restoring old aircraft. For instance, we have ten WW I Standards on our roster, fifteen Curtiss JN-4s, several Thomas Morse Scouts, and so on, with the totals running much higher as the later production era of the late twenties and early thirties is reached. Many of our members are pioneers in aviation, people in the aviation industry, airline and military pilots, and fixed base operators.

Each year we have our annual "Fly-In" meet to bring together the members and many of the old airplanes for flight demonstrations and to relive the old days for a while. This year it will be on September 14-15 at Ottumwa, Iowa, as it was in 1954-55. In 1956 it was held at Oshkosh, Wis. Among the trophies this year will be one for the best restored Waco aircraft attending, offered by Col. Joe Mackey of Mackey Airlines. We extend an invitation to all members of the Air Force Association to attend this meet and see first-hand some of the airplanes that helped to make our aviation industry what it is today.

Our monthly magazine can better inform you of our progress and program for saving old aircraft. It is growing very fast in circulation as it is filling a definite need in aviation reporting.

Bob Taylor, Pres.
Antique Airplane Association
2548 Meadowdale St.
Ottumwa, Iowa

Humor is a Mighty Fine Thing, But . . .

Gentlemen: Your article in "Jet Blasts" entitled "Discipline is a Mighty Fine Thing, But . . ." [May '57 issue] would have been more appropriate if it had been placed under the heading of "Hitting the Air Force Below the Belt" on page 42 and given the same rating in current value to the Air Force as your article of January 1956 "Spit but no Polish." One can read Mr. Sherwood's article with a certain amount of nostalgia so long as they realize that he is writing about a bygone day. Mr. Sherwood's day, like the days of Billy the Kid and the horse cavalry, are gone forever into the glorious past of American history. However, it is nice to think back once in a while and realize how much fun it was to do just about as you pleased in a real swashbuckling environment. It's all right as long as we remember that the past is dead and today cannot be like yesterday. Let's look at some of Mr. Sherwood's comments in the light of today's Air Force and its awe-inspiring responsibilities.

First, let me say that anybody who places the officer code that General Mooney was talking about in the frame of reference which Mr. Sherwood attempts to place it would appear to be more of a writer for the Sergeant Bilko program than an analyst of the needs of the Air Force officer corps. Let's go back and think of the life and times of Class 42-B where many pilots and few officers were trained. Let us ask who said "relax and leave the upperclassmen and the barracks drill right back there." A lieutenant? It is obvious he was a skilled pilot or else he wouldn't have been instructing in flying. But an officer? That all depends upon your frame of reference. Now this appears to be where our writer gets confused. He ridicules the importance of officer conduct and discipline and tells us that he was primarily trained to fly, and even had to forget his officer training so that he could relax and learn to fly.

Mr. Sherwood and General Mooney are talking about two different things and the issue rests away back before their time. General Mooney is talking about "officers" and Mr. Sherwood is talking about "pilots," but thinks that term automatically includes officers because in 1942 no one ever really got around to telling him different. I know General Mooney was talking about officers because he included all officers—non-rated, bombardiers, observers, navigators and pilots.

The problem was created some years ago actually, when it was decided that all military pilots should be officers. There was no other way to become a military pilot. Furthermore, most men volunteering for flying duty had usually been subjected to several years' training and experience as officers before they became pilots; consequently, no one foresaw the problem of having to train pilots without necessarily training officers.

I am sure we all understand that the pilot is a highly skilled technician,

(Continued on following page)

and he can be a pilot without being in the military service, but you can't be an officer without being in the service. You can be a crop duster, airlines or stunt pilot and you still must have "discipline of mind, coordination of the body." They, too, must pay attention to the "many, many details of flying." It's a self-discipline of survival which applies in any situation where to err means death.

So, the discipline is the discipline imposed by flying itself and is not the discipline and conduct that General Mooney is worried about. I doubt that he is worried about the particular brand of discipline that is a constant requirement of successful flying, for the Air Force has always worked hard on pilot proficiency. The discipline which caused Mr. Sherwood "to go deep into enemy country, facing the best fighters in that part of the world, is not the restricted province of pilots or aircrews. This is shared by many brave men, most of whom are not officers or pilots—the airborne troops who went into Normandy that dark morning of June 6, 1944, and jumped into darkness and into combat; the plain infantrymen who every day fought their way deeper into enemy-held territory against "the finest fighters in that part of the world" and stayed there, and slept there, and fought more and did not return each day to England to bed and board and a good rest.

These men, I am sure, would not have confused General Mooney's comments with a survival or emergency situation, unless they were just being funny. It would appear then that Mr. Sherwood's comments on air discipline would be common to all pilots regardless of business, and his comments regarding courage would apply to all fighters, regardless of service. But that still isn't what General Mooney was talking about. General Mooney's primary concern is the development of a professional officer corps in peacetime, trained in the disciplines, customs, and traditions of the military service so as to permit successful prosecution of any future war by using large increments of emergency trained pilot officers and men, and still retain the basic structure of a disciplined military force.

There is no doubt of the fact that if the Army Air Force had not had available a hard core of some 4,000 pre-World War II trained officers in 1941 they would not have been successful in the expansion to 388,000 officers by 1945. General Mooney is also concerned with creating an interest on the part of all officers toward making the officer corps something to be proud of. Actually, if the author will read the words of the oath of office and the commission, I think he will get the idea. If there is still confusion about the incongruity of pilot skill and officer profession this old tale often repeated in the heyday of the cavalry might help: "All officers are good horsemen, all cowboys are good horsemen, therefore all cowboys are officers."

Yes, this little article reminisces well around the clubhouse fire as we talk about the old days, but it's kind of like the history of our West. In the early days of the West, Wyatt Earp, Wild Bill Hickock, and Doc Holliday were part and parcel of their times and were acceptable in that environment. But time pushed them on; they were replaced by law and order. This, too, happens in a service. Ultimately it, too, must grow up.

Lacking the motivation of a war and the disciplines imposed by war itself, it must impose the disciplines of an established service and adopt more and more the practices of military services from time immemorial. Perhaps it is just as well. After all, who can really say how many World War II pilots are dead today because of inadequate discipline and officer training.

Col. Russell V. Ritchey
Norton AFB, Calif.

We're Trying

Gentlemen: I have noticed for some time the letters in "Air Mail" which suggest that AIR FORCE Magazine should carry a wider variety of articles and get away from some of the uninteresting ones that appear many times. I must say I agree.

Articles on B-52s, '47s, Sabrejets, etc., are all very interesting; but let's not overlook the human element. Let us not subordinate the man to the machine. So how about articles on the personnel of the Air Force, the very backbone of this mighty military machine. As a suggestion, you might run an article on AF basic training for the enlisted man, or the OCS. Other interesting articles would be stories on the major commands and the personnel serving in them.

Albert H. Wetzel
Norfolk, Va.

• *Flint O. DuPre has been doing just this sort of thing in our recent series on Air Force careers. Similar articles are in the mill for future publication. The Editors.*

"Could'a been real rough without Tacan*"

Finding a pitching carrier deck or a socked-in air field can be rugged at times. Yet with TACAN, getting home safely through the soup is routine. The compact Hoffman airborne TACAN unit assures all-weather safety, provides continuous course data every second in flight, automatically computes distance and direction to a ground or moving shipboard station. It's another outstanding example of...

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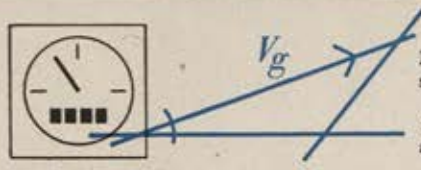


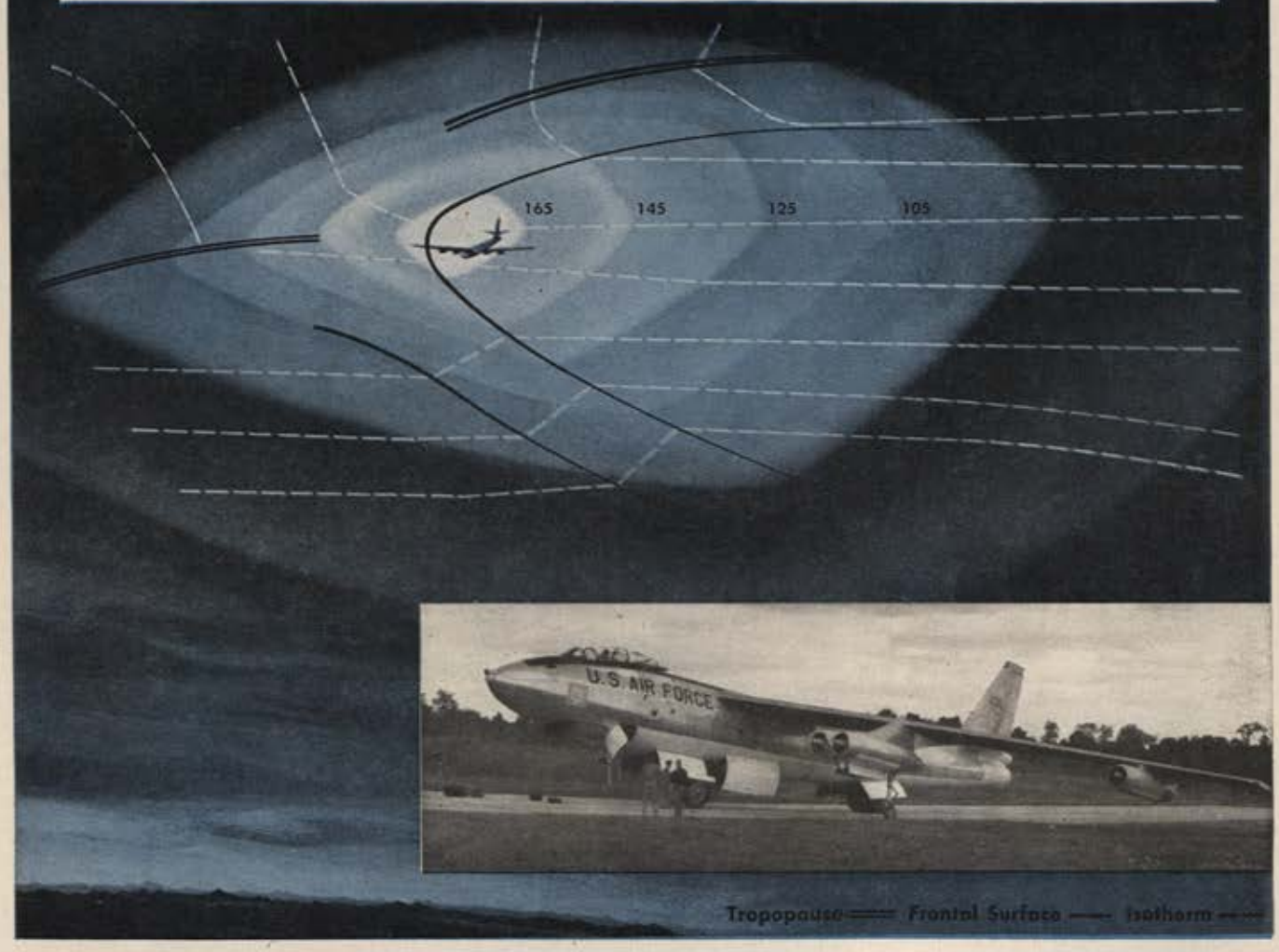
Ground Speed & Drift Angle
Any Time, Anywhere, Any Weather

One look and the pilot KNOWS. In a glance he reads actual ground speed and drift angle.

This vital data, never before available, is displayed on the flight panel automatically and continuously.

The dials "read" the key unit in GPL's revolutionary Doppler auto-navigation systems. Other phenomenal units in these systems tell where you are and how to get where you're going. The systems operate entirely without ground aid or celestial fixes, have proved themselves globally in millions of operational miles.

GPL's auto-navigators are the result of GPL's harnessing of Doppler-effect to air navigation—an achievement comparable in magnitude to the breaking of the sound barrier.



Cross-section of a headline

On January 25, 1957, in the early hours of a California morning, a USAF B-47 climbed skyward into the jet stream. With the aid of one of GPL's self-contained, airborne navigation systems, AN/APN-66, the crew put the plane into a 165 mph-plus jet stream core and held it there all the way across the country. 3 hours, 47 minutes later, the same "47" touched down within sight of the Atlantic Ocean.

The story made headlines and so did the part played by the GPL equipment.

GPL auto-navigators' demonstrated usefulness in locating and flying jet streams is just one application of their basic function — *precise point-to-point navigation, any time, anywhere, any weather.* The systems have flown millions of miles in transport, bombing, fighter, patrol and weather planes.

GPL, who in conjunction with the USAF (WADC) developed these self-contained auto-navigators, is the nation's leading manufacturer of these systems.

AFA MEETING
July 30-August 3

GPL
A SUBSIDIARY OF GPE

GENERAL PRECISION LABORATORY INCORPORATED, Pleasantville, N. Y.

ENGINEERS — GPL achievements have opened up some unusual research and development opportunities. Send resumé to Personnel Manager.

wing tips

By Wilfred Owen

The nation's first industrial helicopter airline on a fixed schedule is carrying Northrop Aircraft executives between company plants in Southern California. Twice-daily trips in a four-place Bell helicopter have cut down travel time on one trip from an hour to eighteen minutes.

° ° °

When a Capital Airlines nose wheel refused to lower into position for landing, the crew poured orange juice, milk, and water into the leaking hydraulic mechanism to force the wheel down.

° ° °

Canada is encouraging immigration by creating an "air bridge" of chartered planes from Europe to carry some 25,000 people to Canadian homes this year. Cost of the flight is $200 for each passenger, and the government of Canada will lend the money for the flight, without interest, and with two years to pay.

° ° °

Air ambulance service is a flourishing part of the flying taxi business. One of the biggest fares on record was

$4,200 for an ambulance case flown from Mexico to a New York hospital.

° ° °

A newcomer to commercial airline service this summer will be the Lockheed turboprop Starliner, probably the last of the big propeller-driven passenger liners. It will carry enough fuel to make the trip from Los Angeles to Paris non-stop.

° ° °

CAA is testing aircraft windshields to determine the impact of birds colliding with jet planes. Present testing equipment is a forty-two-foot cannon capable of hurling a dead bird 900 miles per hour.

° ° °

The end of the old-fashioned fire engine is in sight for suburbia. New York City is planning helicopter firefighters that will carry ten men and their implements, plus a 500-gallon tank of foam.

° ° °

Max Conrad, fifty-four years old and the father of ten children, has made twenty-five solo crossings of the Atlantic in light planes.

° ° °

The baggage delivery time at National Airport now averages 6½ minutes.

° ° °

One billion dollars of military and civil aviation exports during 1956 meant a forty-three percent rise over the previous year and the biggest year-to-year increase ever recorded by the industry.

° ° °

A single fingerprint, according to the Aircraft Industries Association, can throw a gyroscope system out of balance and cause operating inaccuracies. And if a missile guidance unit were placed on top of the Washington Monument, it could record the vibrations caused by a baby entering the door of the Monument 555 feet below.

° ° °

Pan American will start direct service to Paris and Rome from Chicago and Detroit this summer.

FLYING CAMERA DOLLY

As an aid to pilot training, CWO Martin V. Wingrove has recently completed nine moving pictures covering all phases of helicopter flying from the basic rudiments to advanced maneuvers. For air-to-air shots he removed the bubble and converted a Bell H-13 into a flying dolly.

Mr. Wingrove wears the Distinguished Flying Cross, the Purple Heart and Air Medal with 12 Oak Leaf Clusters to show for his two tours as a fighter pilot in Europe. Following the war, he found his way into Army Aviation, graduated in 1951 with the first rotary wing class at Ft. Sill, and served two years as a helicopter pilot in Korea.

One of very few Warrant Officers who rate the starred wings of a Senior Army Aviator, Mr. Wingrove is now at the Army Aviation Center, Ft. Rucker, Ala. His vast experience gained in over 3,000 flying hours is being put to valuable use in training Army Avaitors of the future.

Helicopter flight and mechanical training are available to qualified personnel at the U. S. Army Aviation School, Ft. Rucker, Ala.

BELL Helicopter CORP.

FT. WORTH, TEXAS

Subsidiary of Bell Aircraft Corp.

AIRPOWER — IN THE NEWS

■ One of the strongest endorsements for the **Cordiner Committee findings** has been delivered by **Gen. Curtis E. LeMay,** soon to be AF Vice Chief of Staff. "When the USAF **ceases to be a vocational school,**" he declared, "and **becomes a life work for dedicated young men,** enormous savings will be possible."

Speaking as head of the Strategic Air Command, General LeMay used SAC statistics to illustrate the great AF losses through lack of personnel retention. "In the Strategic Air Command," he said, "**only eight percent of our enlisted grades have been with us more than four years,** which is a single enlistment." The fact that **forty-five percent** of SAC's airmen are in their **first year** was hammered home by the general, who foresees that "we can expect the majority of these men to leave us in three more years . . . just when they have begun to gain that vitally needed experience.

"Last year, **more than thirty thousand SAC airmen left the service** at the end of their first enlistment," he said. "These men took their new skills with them, and it cost the Air Force **nearly a half billion dollars** to train replacements for SAC alone."

General LeMay added that this condition applies equally throughout the Air Force, and that this country will have to cope with such losses until the compensation for skilled military technicians is elevated to that of their civilian counterparts.

■ Soaring to **96,000 feet** in a tiny metal capsule (*see cut*), **AF Capt. J. W. Kittenger** set a new record for manned lighter-than-air flight. The balloon was aloft more than six hours, including some two hours spent at eighteen miles above the earth.

The gondola made an uneventful—but wet—landing in a small Minnesota creek where the pilot was helped ashore by **Maj. David G. Simons,** who is scheduled to take a similar flight to 100,000 feet in the near future.

■ **Capt. Iven Kincheloe**—another high-flying AF pilot—was also in the news again (*see cut*). AF Chief of Staff, Gen. Nathan F. Twining, awarded the **Mackay Trophy** for 1956 to the Korean jet ace. The award went to Kincheloe for his flight on September 7, 1956, when he piloted the **Bell X-2 research rocket aircraft** "considerably higher than had ever before been reached by man."

■ The **National Warning System** (NAWAS) is the new civil defense network linking **200 key points** with three national warning centers. They are located at **Colorado Springs,** the central national site and headquarters of the Continental Air Defense Command (ConAD), the eastern warning center at **Stewart AFB, N. Y.,** and the western warning center at **Hamilton AFB, Calif.** The system can now flash warning of an impending enemy attack from coast to coast in **less than sixty seconds.**

■ The **Distinguished Service Medal,** highest honor awarded by the **National Advisory Committee for Aeronautics,** has been presented to **H. Julian Allen** (*see cut*) for his important research contributions to the solution of re-entry problems of long-range missiles. (*See, "Tech Talk" on page 85.*)

■ The Air Force has set up a **camp and airfield near the North Pole** on a **floating ice cake** nearly four miles square. The polar camp, which is moving toward the North Pole at the rate of a mile a day, will be used by scientists connected with the **International Geophysical Year.**

(Continued on following page)

Wide World Photos, Inc.

AF Capt. Joseph W. Kittenger is welcomed back to earth by Maj. David G. Simons after his record-shattering flight.

The highest honor awarded by NACA is bestowed on H. Julian Allen by James Doolittle, for his research efforts.

The Mackay Trophy for 1956 has been won by AF Capt. Iven C. Kincheloe for his record flight in the Bell X-2.

Maj. Robinson Risner commemorated the 1927 Lindbergh flight by flying over his route in a fifth of the time.

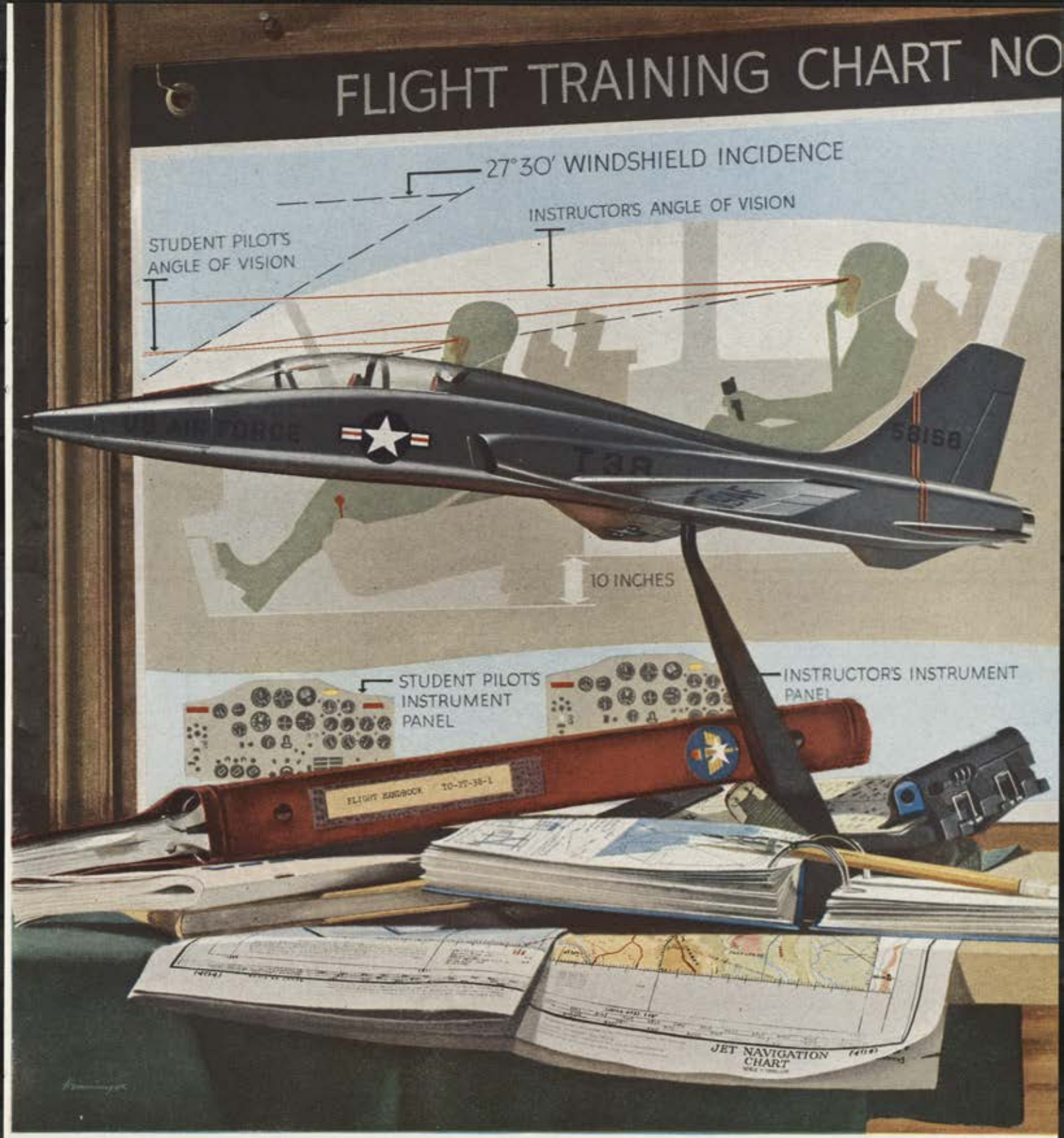
General Everest | General Anderson | General Tunner | General Gerhart | General Hall | General Todd | General Landry

■ **Hardest hit** by Secretary of Defense Wilson's order to cut FY 1957 spending was the **Air Force,** which had to absorb **half of the $500 million slash** during June. The **Navy** was ordered to trim its spending by **$150 million,** and the **Army by $100 million.** The new order followed closely on the heels of a directive issued by Secretary Wilson which would further cut Air Force spending in FY 1958 by $3.5 billion. *(See editorial on page 30 for background on this Air Force fund cutback.)*

■ President Eisenhower has nominated **lieutenant generals Frank F. Everest and Thomas S. Power** to four-star grade and approved their assignments to new positions. General Everest will become Commander-in-Chief of USAFE and General Power, as announced in this column last month, will succeed **Gen. Curtis E. LeMay** as head of the Strategic Air Command. Three **major generals—William E. Hall, Walter E. Todd, and John K. Gerhart—** were nominated for three-star grade and given new assignments. General Hall will be commander of ConAC. General Todd will be Chief of Staff of the United Nations Command, Korea, being relieved as Vice Commander and Chief of Staff, FEAF. General Gerhart will be Deputy Chief of Staff, Plans and Programs, USAF, after duty as Commander of Twelfth Air Force, USAFE.

Lt. Gen. Samuel E. Anderson will succeed General Power as Commander of ARDC after serving as Director, Weapon System Evaluation Group, Office of the Secretary of Defense. After duty as Commander in Chief, USAFE, **Lt. Gen. William H. Tunner** will be reassigned as DCS for Operations, USAF and **Maj. Gen. Robert B. Landry,** Commander of ConAC's Fourth Air Force, will become Assistant DCS for Personnel, USAF.

■ **STAFF CHANGES. . . . Major Gen. Richard C. Lindsay,** Assistant DCS/Operations, Hq., USAF, will be promoted to three-star rank and reassigned as Commander, Allied Air Forces in Southern Europe, effective August 1. . . . **Brig. Gen. Edward B. Gallant,** Special Assistant to Chief, Army-AF Exchange Service, becomes Director of Procurement Inspection, 1002d Inspector General Group, Hq. Command, Norton AFB, Calif., July 8. . . . **Brig. Gen. William T. Thurman,** Deputy Director, Procurement, has moved up to Deputy Director, Procurement and Production, Hq., AMC. . . . **Brig. Gen. Benjamin O. Davis,** on unspecified assignment at Hq., USAF, has been reassigned as Chief of Staff, Twelth Air Force, replacing **Brig. Gen. William J. Bell,** who will move to Hq., USAF, for duty with OJCS as Member, Joint Middle East Planning Committee, on August 15. . . . **Brig. Gen. Don R. Ostrander,** Assistant for Guided Missiles, Hq., ARDC, has replaced **Brig. Gen. Kurt M. Landon** as Deputy Commander for Resources, Hq., ARDC. . . . Earlier orders assigning **Brig. Gen. Wilford F. Hall** to Hq., USAF, have been changed. He will go to Hq., AMC, as Surgeon, August 1. . . . **Brig. Gen. Norman D. Sillin,** DCS/Operations, Hq., ConAC, has replaced **Maj. Gen. Homer L. Sanders** as Commander, Allied AF Northern Europe. General Sanders will be assigned to Hq., ConAC, for duty as Vice Commander, Sept. 6. . . . **Brig. Gen. James E. Roberts,** Inspector General, ATC, will replace **Brig. Gen. Charles D. Jones** as Chief of Staff, Allied AF Northern Europe, July 16. General Jones will become Deputy Director for Legislation and Liaison, Hq., USAF, August 30. . . . **Brig. Gen. John S. Hardy,** formerly scheduled for a spot in DCS/Personnel, Hq., USAF, has been reassigned for duty as Commander, Fourteenth AF, on August 1. . . . **Brig. Gen. Julian M. Chappell,** Commander, Seventh AF, became DCS/Operations, Hq., ConAC, July 1. . . . **Maj. Gen. Richard A. Grussendorf,** Commander, 6th Allied Tactical AF, will become Assistant Chief of Staff for Reserve Forces, Hq., USAF, August 26. . . . **Brig. Gen. Sam Maddux,** Commander 3535th Navigator Training Wing, replaced **Maj. Gen. Gabriel P. Disosway,** July 1, as Commander, Flying Training AF, ATC. General Disosway is now Commander, Twelfth AF, USAFE. . . . **Lt. Gen. Earl W. Barnes,** Chief of Staff, Far East Command, has resumed his temporary grade of major general with his reassignment to Hq., USAF, for an unspecified position. . . . **Brig. Gen. Lawson S. Moseley, Jr.,** Chief, War Plans Div., DCS/O, Hq., USAF, has been assigned as Special Assistant to Director of Plans in DCS/Operations. . . . **Brig. Gen. Edward W. Suarez,** Vice Commander, Central Air Defense Force, will replace **Maj. Gen. Wiley D. Ganey** as Deputy Commandant, National War College, July 22. General Ganey replaces **Maj. Gen, Carl A. Brandt** as Commander, Technical Training AF, ATC, July 22. General Brandt will become Vice Commander of ATC on the same date. . . . **Brig. Gen. Ralph E. Koon,** Vice Commander, Pacific Air Force, was reassigned as DCS/Operations, PAF, on July 1. . . . **Maj. Gen. Roscoe C. Wilson,** Commander, Third AF, USAFE, has been assigned to Hq., USAF, effective July 1. . . . **Brig. Gen. Donald R. Hutchinson,** Assistant to Vice Chief of Staff for Air Defense Managements Systems, Hq., USAF, became Deputy Assistant for Mutual Security, DCS/M, on June 10. . . . **Maj. Gen. Matthew K. Deichelmann,** Special Assistant to Commander, FEAF, became DCS/Administration and Logistics, Pacific Air Force, on 1 July. . . . **Brig. Gen. Oliver K. Neiss,** FEAF Surgeon, became Command Surgeon, Pacific Air Force, this month. . . . **Brig. Gen. Robert S. Macrum,** FEAF Comptroller, was reassigned as DCS/Comptroller, Pacific Air Force, on 1 July. . . . **Maj. Gen. Donald J. Heirn,** Chief, Office of Aircraft Nuclear Propulsion, Hq., ARDC, has been reassigned as Assistant DSC/D, for Nuclear Systems, Hq., USAF. . . . **Maj. Gen. Sory Smith,** Commander, PAF, has become Chief of Staff and Vice Commander-in-Chief, Pacific Air Forces. . . . **Maj. Gen. Wendell W. Bowman,** Commander, 34th Air Division, Kirtland AFB, N.M., will become Vice Commander, Hq., CADF, Richards-Gebour AFB, Grandview, Mo., on July 15. . . . **Brig. Gen. Monro MacCloskey,** Commander, 28th Air Division, ADC, retired June 30.—END



SIMPLE ARITHMETIC– It costs approximately ten thousand dollars to send a student through college today, but more than ten times that amount to give a young man the superlative training that he must receive to become an Air Force pilot. A saving in either expense would be welcome to most Americans. Northrop Aircraft is ***doing something*** about reduction of national defense costs by applying "dollar engineering" to planning and production of new weapon systems. Latest Northrop achievement is its supersonic T-38 jet trainer, a simple, lightweight airplane capable of using any improved airport. Costing less to produce, fuel and maintain than other airplanes with comparable performance, the T-38 can save American taxpayers hundreds of millions of dollars in pilot training. This T-38 jet trainer...and the Snark SM-62, world's first intercontinental guided missile...are noteworthy developments of the budget-minded research, engineering and production teams at Northrop.

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airman's bookshelf

It has been said that Alaska jumped from the dog sled to the airplane. Thousands of Eskimos who have never seen an automobile can tell the difference between a Stinson and a Fairchild from miles away. There are few roads in the territory, but nearly every town (or cluster of Eskimo huts) has its airfield. Wrecked planes dot the mountain sides—silent monuments to a race of air pioneers. Today the airplane brings Alaska its meals and its scotch, delivers the newspapers, flies in its shoes, clothes, medicine, and myriad other things. Alaska, perhaps more than any other place on the globe, is a product of the air age.

It was Bob Reeves and a hardy group of Alaskan bush pilots who helped open this arctic wilderness. *Glacier Pilot*, by Beth Day (Henry Holt, $4.50), is Reeves's personal story—the adventures of an airman of fortune, the founder and owner of Alaskan-Aleutian Airways.

When Reeves arrived in Alaska in 1932 he was penniless, ill, and without an airplane. Flying the mail across the South American Andes should have given him enough adventure for one lifetime. But adventure is a siren to a man like Reeves. Tales of opportunity, wealth, and rugged flying drifted down the airways, and soon Bob found himself ashore at Valdez, a tiny Alaskan coastal village in a rich gold-mining area.

Reeves had to prove to the townspeople that he belonged in a cockpit and was not just another wandering bum. Contracting to fix up and fly a wrecked "Eaglerock" did the trick and earned him the confidence of the rough, tough customers to whom the airplane afforded the only transport to inaccessible mountain slopes and valleys. Reeves soon became known as a man who would fly and land anywhere a customer would ride. And where the courage and skill of his fellow bush flyers left off, Reeves picked up the business and built it into a thriving enterprise. No job was too small, too great, too difficult.

His willingness and ability to land men and equipment high up on the icy slopes of the wild gold-rich Chugach Mountains earned him the title of Alaska's first glacier pilot. His engineering prowess enabled him to exact unheard-of performance from his aircraft at high altitudes.

Glacier Pilot is a book that will long live in the hearts of all airmen—the tale of a real air pioneer and others of the same breed who challenged a primitive country in single-engine airplanes without modern communications, weather forecasts, navigational aids, prepared airfields, or the promise of anything but the next meal ticket—if they lived. And when war came, these men gave their tireless energy, experience, and knowledge to the Air Force. Says Reeves of the early war days, "Alaska could have been taken with spit balls." But for the airplane, it might have been.

The story of Bob Reeves and his cronies chronicles an era in aviation history comparable to that of our frontiersmen of an earlier century. Airman Reeves had what the unforgiving Alaskan sky demanded, just plain "seat-of-the-pants" flying skill—and guts! His story ranks with the most dramatic in air history. *Glacier Pilot* does it justice.

* * *

It is appropriate that during the Fiftieth Anniversary year of military airpower, one of America's best known aviation writers and war reporters should tell the story of the first war in the air. The writer is Quentin Reynolds, and the book is *They Fought for the Sky* (Rinehart, $3.95). Except for the memory of a few of the heroes—men like Richthofen, Mannock, Bishop, Rickenbacker, Lufbery, Luke, Immelmann, Mitchell, Boelcke, Fonck, and Fokker—time has largely erased from the public mind this fascinating chapter of warfare. This book corrects that situation.

When military forces joined in 1914 there was no air war at all. England had a Royal Flying Corps—and the French and Germans had their own forces. But, writes Reynolds, in August 1914 "not one experienced British military leader in a hundred . . . accepted the airplane even as a potential help to ground forces." And German High Command "misconceptions as to the potential worth of the airplane" were "almost unbelievable in view of the pride of Germany's prewar army and its military efficiency."

In August 1914 an imaginative British pilot, Louis Strange, mounted a Lewis machine gun on his observation plane. He was icily reminded by his commanding officer that "machine guns are for use on the ground . . ." and was ordered to remove it. He did. Eventually Louis Strange was vindicated and lived to use a mounted Lewis with telling effect—the first in a long line of vindications in air history.

Bombing, too, came along the hard way. Observation pilots, low over the target, would toss down a hand grenade. But earlier the airplane had been strictly an observation platform, and even as such most ground commanders couldn't conceive the difference between "the horizontal observation of the cavalryman and the vertical view of the airman." As Reynolds puts it, neither did they recognize the difference between an airplane and a horse.

But it didn't take the airplane long to convince at least some of the "Colonel Blimps" on both sides that airpower could be a weapon of tremendous impact in war. From next to nothing, in four years each side developed to terrible perfection its ability to kill and destroy in the sky. And in September 1918 Billy Mitchell launched a 1,481-plane attack against enemy troops caught in the St. Mihiel salient. "It was not a physical blow as such things are reckoned in war," writes Reynolds, "but morally it was a catastrophe. An army without a rear, cut off from its homeland, thwarted in both advance and retreat, and covered from above, is an army lost. . . . In two days, sixteen thousand Germans surrendered. In two more days the entire St. Mihiel salient was destroyed as an enemy strongpoint."

Airpower as we know it today was born during those four years and with it a new race of men, although few but visionaries like Billy Mitchell and Britain's "Boom" Trenchard realized it. When the US declared war in 1917, the Aviation Section of the Signal Corps was an annoying stepchild in the US Army, just as the Royal Flying Corps had been in August 1914, three years earlier. Nobody in GHQ, despite the reports coming back to Washington since 1914, had given much thought to what role the Aviation Section would play in case war came. And although large numbers of American pilots flew against the Germans, few American-built planes got into combat.

The airmen of 1914-1918 were the modern knights of the air. Today people stare and shake their heads at the "crates" these modern knights flew in one of the most dramatic war adventures of all time. And in his book, Reynolds, who is a bug on World War I flying, pays homage to these men. In his informative and engrossing story-telling style, he chronicles the technical developments of military air-

(Continued on following page)

craft from the first synchronized machine guns *(see page 102 of this issue)* to the first great bombing offensives; the beginnings and operations of British, French, German, and US units at the front; the zeppelin raids on London; the Lafayette Escadrille, and the hundreds of exciting dogfights over No-Man's Land.

Two items could have been added to Reynolds's book: a consolidated listing of the air heroes, both Allied and German, and their aerial victories, and maps to orient the layman reader as to location of events and the scores of place names. But on the other hand, the book includes two extremely valuable features: a bibliography of World War I air books; and a series of rare World War I photos.

It's a safe bet *They Fought for the Sky* will be warmly welcomed by flyers of all generations, historians, students of military history, and all laymen who just enjoy dramatic, thrilling, informative reading about high adventure.

° ° °

Few prisoners-of-war stories out of World War II can approach Sidney Stewart's *Give Us This Day* (W. W. Norton, $3.50). Twenty-one-year-old Stewart, drafted from medical school into the Army, was captured at Bataan, survived the infamous Death March, and spent the war in Japanese prison camps. His horrifying ordeal as a POW in the Philippines was dwarfed by the incredible suffering he underwent in the holds of Japanese freighters en route to Japan and Manchuria in late 1944 and the spring of 1945. At war's end he was the only survivor out of 3,000 fellow POWs. His story is a shocking documentary of Japanese inhumanity, and, on the other hand, of the courage of American GIs, to their death. This is a moving, vividly descriptive narrative, a book that is hard to put down.

If some great hand of justice moved in retribution for the brutality Americans received at Japanese whim, it must have ordained the atomic destruction of Japanese cities. And although *Nine Who Survived Hiroshima and Nagasaki*, by Robert Trumbull (E. P. Dutton, $2.95), may provide Stewart's readers some little comfort in revenge, it nevertheless elicits deep sympathy and pity. Trumbull, who is chief of the New York *Times* Tokyo Bureau, tells the personal stories of nine Japanese who lived through the first atomic explosion and fled hysterically to nearby Nagasaki. There for the second time in three days they saw in the sky the unearthly flash and another city disappear in atomic fury. With atomic-air capability no longer an American monopoly, these stories carry meaningful and worthwhile lessons for us all.

° ° °

Two former RAF radar-gunners tell the story of the radar-equipped night fighters, the men who pioneered night air combat, and the role they played in the battle for control of the air over Britain in World War II. *Night Fighter*, by C. F. Rawnsley and Robert Wright (Henry Holt, $4.50), is a solidly written, detailed narrative of the early growth of a military specialty that is a precision skill today.

No single part of the air war held more hazard and frustration than night fighting. To search for a dark shape against a black sky was bad enough. But even worse was the added ingredient of British weather that sometimes stood down even the most experienced crews. Yet night after night RAF "Magicians," or "Black Box Artists," as they were known, took off in pursuit of a blip on a radar scope.

In Rawnsley's words: "We scraped off after them into the drizzle and set course. . . . The earth was gone in a flash, and we were alone in the center of emptiness. Only the needles of the instruments . . . could tell us what was happening. . . . Without them we were anywhere, and nowhere, and we had to believe them or perish. We were still, floating motionless in a void, going neither up nor down, until . . . the reassuring voice of . . . the GCI . . . gave us a lead . . . and soon John had a Heinkel in sight. . . . Almost immediately . . . the Heinkel banked steeply over . . . came running back at us . . . flashed past only a hundred yards away. . . . John had the Beaufighter already staggering around after them, the force of the turn pressing me down outrageously into my seat . . . so dazzled . . . that before I could make out anything on the face of the cathode ray tubes . . . there was nothing worth seeing." So went early night fighting, mission after mission.

When the stripped-down Blenheims were finally replaced with radar-equipped Bristol Beaufighters and later with de Havilland Mosquitos, the operation improved. But even with radar, the task was formidable. Radar range was too short, time for action insufficient. Besides, no tactics had been devised. Night-fighting was new, and RAF crews had to experiment in enemy-controlled skies. The price of learning was high. Luftwaffe bombers rained destruction on English cities below while the valiant RAF night crews helplessly sought the elusive targets. But, eventually, out of persistence, ingenuity, and sheer courage came the tactics that countered the German air offensive.

The professional airman will find this an informative, interesting story of a relatively unknown part of WW II.

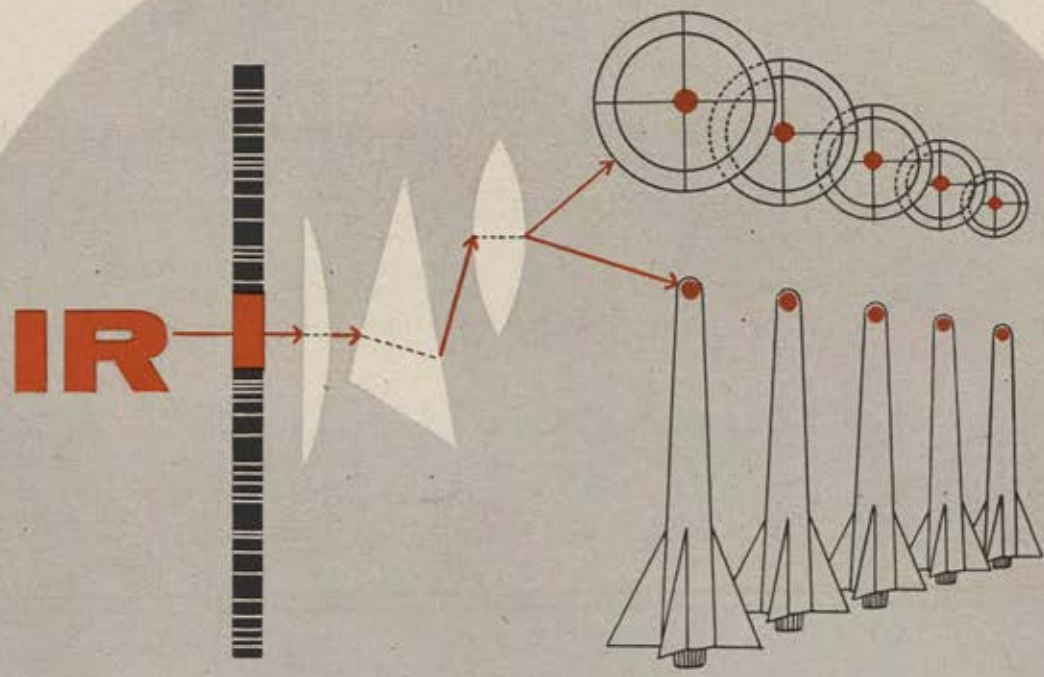
° ° °

Believing that the return of the giant dirigible powered by atomic engines holds the key to cheap cargo and passenger air carriers, both military and civilian, Edwin J. Kirschner builds an interesting case in *The Zeppelin in the Atomic Age* (University of Illinois Press, $3.50). This study developed out of research done by the Air Coordinating Committee to determine the feasibility of the return of the airship. About half the book is devoted to a history of the zeppelin. Chapters following examine engineering characteristics, economy of zeppelins, their role in US government organizations, and their use by such international bodies as the ICAO and the United Nations.

° ° °

Stories of the daring adventures of airmen threading their way back after being downed in enemy territory will never tire readers. Aidan Crawley, British newspaper writer and a former Member of Parliament and Undersecretary of State for Air in the Attlee Cabinet, contributes perhaps the best of these accounts to come out of World War II. *Escape From Germany: A History of RAF Escapes During World War II* (Simon and Schuster, $3.95) is an authentic and highly readable story of the attempts at escape made during the war by the 15,000 RAF airmen captured by the Germans. A surprising number of these airmen, at one time or another, tried escaping their prison compounds, but only fifteen out of the 15,000 actually made it back to England before the end of the war. It is the story of these that Crawley covers in detail, providing drama and excitement to a historical study. Combat airmen will find valuable tips on how prisoners set up and operated underground activities behind barbed wire; how they organized spy and courier systems, forged passports and identification papers, counterfeited money, manufactured radios, planned and carried out escapes, both successful and unsuccessful. *Escape From Germany* is a story of human courage and ingenuity and man's unconquerable struggle for freedom. The author is a topnotch journalist, and his book was originally written as an official classified history for the Air Ministry. It was downgraded and revised for publication after Korea.

—CAPT. JAMES F. SUNDERMAN



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Celebrating the Golden Anniversary of the USAF

WASHINGTON, D. C. • JULY 31-AUGUST 4

SCHEDULE OF EVENTS...

PRE-CONVENTION EVENTS

AIRPOWER REVIEW
Andrews Air Force Base

SUNDAY—JULY 28:
2:00 PM: Aerial Demonstrations
Static Displays
USAF Thunderbirds
Finish of Ricks Jet Flight
Bendix Trophy Race

RESERVE FORCES DAY

TUESDAY—JULY 30:
1:00 PM: Reserve Forces Seminar
5:00 PM: Reserve Forces Reception
6:30 PM: Reserve Awards Banquet

INDUSTRY DAY

WEDNESDAY—JULY 31:
9:00 AM: Air Materiel Briefing
12:15 PM: Industrial Luncheon
2:30 PM: Research & Devel. Briefing

AFA's 1957 National Convention has been divided into two sections—*Pre-Convention Events*, July 28-31; and the *Convention Program*, July 31-August 4. The schedules to the left and right indicate the events included in each.

Everyone planning to attend the Convention is urged to *register in advance*. The attached form is for this purpose. Complete the form, attach the appropriate payment, and mail to AFA Headquarters, Mills Building, Washington 6, D. C.

More than 3,000 persons are expected to attend the Convention. This will be the biggest in AFA's eleven-year history. The Convention will climax the celebration of the Golden Anniversary of the US Air Force.

CONVENTION PROGRAM

WEDNESDAY—JULY 31:
9:30 AM: AFA Leaders Meeting
2:30 PM: First AFA Bus. Session
7:00 PM: Panorama Preview Reception

THURSDAY—AUGUST 1:
Anniversary Day
9:00 AM: Air Force Memorial Service
10:00 AM: Airpower Panorama
USAF Stamp Ceremony
12:30 PM: USAF Anniversary Banquet
9:00 PM: Anniversary Balls

FRIDAY—AUGUST 2:
9:00 AM: Second AFA Bus. Session
10:00 AM: Airpower Panorama
12:30 PM: Airpower Luncheon
Fashion Luncheon
3:00 PM: Airpower Symposium
7:00 PM: Reunion Cocktail-Buffet

SATURDAY—AUGUST 3:
9:00 AM: Third AFA Bus. Session
10:00 AM: Airpower Panorama
2:00 PM: Final AFA Bus. Session
7:00 PM: Awards Banquet

SUNDAY—AUGUST 4:
9:30 AM: Airpower Brunch

HON. JAMES H. DOUGLAS

Secretary of the Air Force

Will address the Awards Banquet Saturday night, August 3

GENERAL THOMAS D. WHITE

Chief of Staff, USAF

Will address the Symposium Luncheon Friday noon, August 2

GENERAL EDWIN W. RAWLINGS

Commander Air Materiel Command

Will speak at the Industry Briefing Wednesday morning, July 31

JAMES STEWART

Actor, pilot and Reservist

Will participate in USAF Anniversary Celebration Events on August 1

LT. GEN. WILLIAM E. HALL

Commander Continental Air Command

Will speak at the Reserve Forces Seminar Tuesday, July 30

MAJ. GEN. WINSTON P. WILSON

Chief, AF Div. National Guard Bureau

Will speak at the Reserve Forces Seminar Tuesday, July 30

The Airpower Review at Andrews Air Force Base on Sunday, July 28, will feature ground and aerial displays of old and new planes; the USAF Thunderbirds; the finish of the Ricks and Bendix cross-country speed runs; engine-change competitions; and more.

The Air Force's 50th Birthday party will be climaxed on August 1 by three Anniversary Balls—each representing a wartime theater—American, Asiatic-Pacific and European-African-Middle Eastern. Name bands and name entertainment will be featured.

76,000 sq. ft. of weapons and equipment displayed by 115 companies and the US Air Force will attract more than 100,000 persons to AFA's 1957 Airpower Panorama at Washington's National Guard Armory, August 1, 2 and 3.

Complete, Clip, and Mail to AFA, 324 Mills Building, Washington 6, D. C.

ADVANCE REGISTRATION FORM FOR 1957 AFA CONVENTION

NAME..... RANK.....

TITLE.....

AFFILIATION.....

ADDRESS.....

CITY..... STATE.....

Please check ONE of the following categories with which you wish to be identified in the attendance record:

( ) GOVERNMENT ( ) ACTIVE MILITARY ( ) AFA

( ) INDUSTRY ( ) RESERVE GUARD ( ) .....

* *INDUSTRIAL REGISTRATION ($35) restricted to personnel of AFA Industrial Associate Companies ONLY, and includes INDUSTRY DAY plus the CONVENTION PROGRAM.*

I ( ) AM ( ) AM NOT AN AFA MEMBER

Check the type(s) of registration desired and attach full payment:

( ) MEMBER $25

( ) LADIES $25

( ) INDUSTRIAL* $35

TOTAL: $

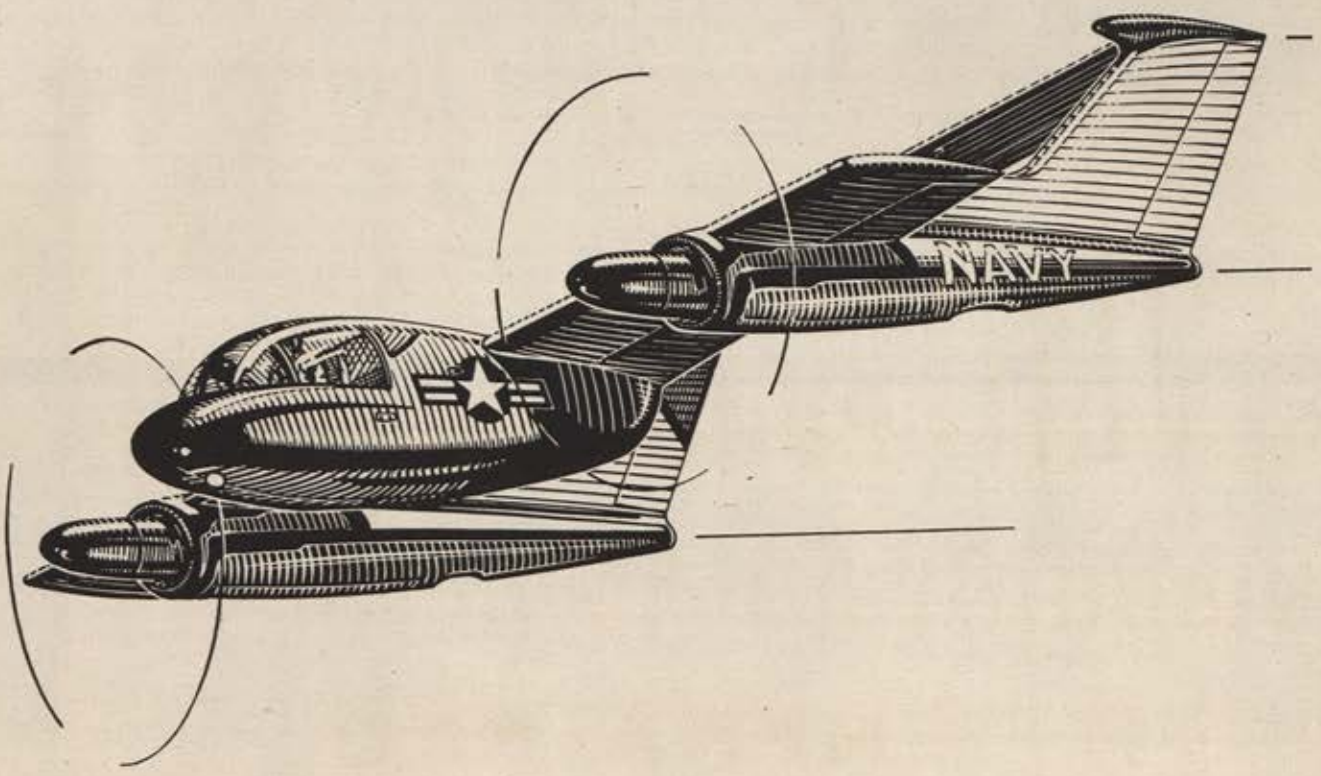
Please check the ANNIVERSARY BALL you wish to attend August 1:

( ) AMERICAN THEATER

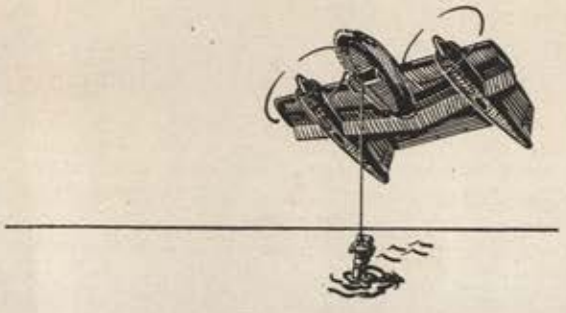
( ) ASIATIC-PACIFIC THEATER

( ) EUROPEAN-AFRICAN-MIDDLE EASTERN THEATER

New **STOL** Aircraft will dart to 300 mph...



...slow to a hover



Kaman Aircraft, under contract to the U.S. Navy, is developing a new and different STOL aircraft concept. Drawing on its experience as a pioneer in the development of turborotor helicopters, Kaman has designed an aircraft which will incorporate the best features of helicopter performance from 0 to 50 mph, and perform as a fixed wing aircraft at speeds up to 300 mph.

This STOL aircraft is another contribution Kaman is proudly making to our National Defense effort.

KAMAN

THE KAMAN AIRCRAFT CORPORATION
Bloomfield, Connecticut

What's New With ★ RED AIRPOWER

Here's a summary of the latest available information on Soviet air intelligence. Because of the nature of this material, we are not able to disclose our sources, nor to document the information beyond the fact that the sources are trustworthy.

The Russians have announced officially that they soon will establish a new polar drift station on the icecap somewhere north of Alaska. It will be the seventh station they have set up in their long history of research into the nature and behavior of the Arctic Ocean and the polar icecap. Seventeen men will compose the staff of the station, which will be supplied by air by twin- and four-engine aircraft.

The Russians also say they will place fifteen automatic radio-meteorological stations on the drifting ice floes in the Arctic Ocean. Temperature and pressure information will be transmitted by the stations, which will be unmanned.

• • •

One of Russia's early geniuses in helicopter design, Boris Nikolayevich Yuryev, died on March 14 of this year. He was sixty-eight years old and had the military rank of a lieutenant general in the Aviation Engineering Services. Yuryev combined theory with practice, and built many of the helicopters which he designed. No Soviet helicopters of recent years have been credited to him.

• • •

O. K. Antonov, designer of the Ukrainia, the Russian transport powered by four turboprop engines (*see page* 82) now is working on a VTOL or STOL (vertical or short take-off and landing) aircraft, which has been given the pet name Little Bee.

Speaking of the design in Moscow recently, Antonov said the Little Bee called for an airplane designed in such a way that it resembled "a helicopter in its take-off and landing qualities, but would be superior to the helicopter in other aspects. A plane of this sort is needed for rapid communication within a province, for mail delivery, for handling small freight and patients, and for various agricultural jobs."

"The basic version of the Little Bee," said Antonov, "will be a passenger plane resembling a comfortable seven-passenger automobile, with heating and ventilation. Its minimum speed will be about twenty-five miles per hour and its maximum speed more than 135 mph."

The craft will be able to land in "any field camp, on any rural road or collective farm threshing floor," declares Antonov.

• • •

The USSR recently announced that it was going to decentralize much of its industry, transferring direct responsibility for administration of manufacturing plants to local officials in ninety-two newly created districts.

In addition to sound business reasons for decentralizing their industrial empire so that it is in more easily administered units, the Russians have good military reasons for decentralizing. Until now, all administration has been centered in Moscow. In addition, all of the country's important research and scientific laboratories have headquarters there. This means that one H-bomb could wipe out the top brains of the USSR.

Now the Russians are establishing a great many more or less independent nerve centers for much of their industry. For the time being, the important heavy industry and defense industry ministries will remain centralized, with their operations directed from Moscow. However, it is reasonable to assume that these ministries also will be decentralized in some measure once a greater number of competent managers has been found.

Decentralization, as every large American firm that has gone through a similar process has learned, puts a severe strain on managerial talent until more people can be trained to take over the additional managerial duties created by the process.

• • •

Decentralization of Soviet industry will require that a similar program to decentralize science be undertaken in the USSR. Such a program already has been called for by Dr. Peter L. Kapitsa, leading Russian physicist. Kapitsa, who was trained in England and for many years was out of favor with Joseph Stalin, proposes that new scientific and technical organizations be set up to solve difficult industrial problems as they arise. These "fire-fighting" technical groups would consist of specialists from diverse, but appropriate fields, who would be brought together to find the best answers to industrial problems as fast as they arise.

Kapitsa cited the building of an atomic-powered airplane as an example of a field in which many diverse specialists must be brought together to overcome the problems.

• • •

The Russians are claiming (according to *Pravda*, February 15, 1957) that they are making progress toward controlling thermonuclear reactions. Last year Russian scientists who were visiting Britain indicated that they were working on the problem of how better to control a nuclear reaction.

The work has important implications for thermonuclear powerplant applications. One of the possible applications of this use of atomic power would be to drive missiles into outer space.

Pravda claims that an institute headed by academician I. V. Kurchatov has achieved "important results in its study of the possibility of creating" such controlled reactions.

• • •

There has been much speculation about why the Russians are putting so much effort into the Antarctic continent, where they have three bases established for the International Geophysical Year.

Commenting on the earth's southernmost continent, the Moscow University *Herald* said way back in 1950: "This continent strategically controls the common international route around Cape Horn and the air communications between South Africa and South America."—END

Nature's spectacular electrical forces, harnessed by man, advanced civilization to a new plateau

THE AWESOME FORCES OF ATOMIC ENERGY WILL BE PUT TO WORK, AS ELECTRICITY WAS, TO ENRICH THE WORLD. TODAY, IN NORTH GEORGIA, LOCKHEED SCIENTISTS ARE TAKING FIRST STEPS TOWARD DEVELOPING FOR THE USAF A NUCLEAR-POWERED PLANE, ABLE TO FLY AROUND THE WORLD ON A HANDFUL OF ATOMIC FUEL.

LOCKHEED *means leadership*

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Editorials

★ The Roller Coaster Jumps the Track

Roller-coaster financing is nothing new to the Air Force. It has seen its program go up and down so often that it can re-program at the drop of a hint. But last month the roller-coaster car not only went down again; it jumped right off the fiscal track. The force goal of 128 wings remained unchanged. But two directives from Secretary of Defense Charles E. Wilson served to insure that the goal would never be reached, that the modernization of the force would be indefinitely delayed, and that the Air Force would wind up as a 110-wing or so force long before we predicted.

The two Wilson directives combined to cut almost $4 billion out of projected Air Force spending, a quarter of a billion in FY 1957 and a whopping $3.5 billion, or some forty percent, out of spending programmed for FY 1958.

The effect of the spending freeze, issued without warning, sent Air Force programs reeling. In a matter of hours the whole procurement program had to be revamped.

Shutting off FY 1957 expenditures put the Air Force in a bad enough box. But much worse in its long-range implications was the Wilson directive which cut $3.5 billion out of expenditures planned for Fiscal Year 1958, concentrated in aircraft and related procurement. This forty percent slash in the FY 1958 buying program cannot help but have a disastrous effect. In a memorandum to Mr. Wilson as reported in the Washington *Star*, Air Force Secretary James H. Douglas said the directive would necessitate "large-scale terminations (of aircraft and weapons orders) and stretch-out of programs. . . ."

An Air Force document submitted in back-up to the Douglas communication went even further in predicted effects. A strict interpretation of the Wilson directive would, it said, mean that "serious cuts would be applied to aircraft, missiles, ballistic missiles, product improvement, modernization of facilities and of aircraft."

Just how serious this all would be was outlined in the document as follows:

"1. In the missile area only the Goose, Bomarc, the GAR series of air-to-air guided missiles, the Q-2 drone and ballistic missiles would remain.

"2. Several major facilities would be required to reduce their employment . . .

"3. A Fiscal Year 1959 re-order capability would be confined to only the B-52/KC-135 bomber-tanker combination, one interceptor, one fighter-bomber, primary trainers, the interceptor missiles, the GAR series of air-to-air guided rockets, one drone, one decoy and the ballistic missiles.

"4. A major industrial-economic upheaval displacing large numbers of people in the Air Force's industrial back-up would be expected.

"5. Product improvement programs would virtually cease and serious production problems of stop and re-start would be introduced.

"6. The financial loss to the government in termination alone would amount to hundreds of millions of dollars."

Questioning by the Senate Appropriations Committee elicited detailed estimates as to what might have to be cut from the FY 1958 buying program. They included:

Elimination of the Convair F-106 all-weather interceptor.

Reduction of about forty percent of Lockheed F-104 interceptor procurement.

Reduction of more than 100 McDonnell F-101B long-range fighters.

Elimination of the Republic F-105 tactical fighter-bomber.

Elimination of an entire wing of Lockheed C-130 turbo-prop transports.

A further slow-up of Boeing KC-135 tankers. (Until a month ago, the Congress was being told of plans to produce these much-needed tankers at a rate of about twenty per month. This was later cut to fifteen per month and now KC-135 production may be cut even more—to eight or ten per month.)

Or let's take the case of the Convair B-58 Hustler, this nation's first supersonic bomber. High promise of the B-58 in tests has been represented as the main reason why the production of B-52s can be reduced. But it now appears that the Wilson directive will virtually eliminate the B-58 from the FY 1958 buying program.

And if these cuts in the manned aircraft force were not enough, here is the expected impact on our missile program as far as FY 1958 buying is concerned, providing the directive stands as issued:

Cancellation of the Northrop Snark intercontinental missile.

Cancellation of the Bell Rascal—a missile designed to be launched from our bombers out of range of enemy point defenses.

Cancellation of a newer missile, similar to the Rascal, but with greater range.

Cancellation of the new model Matador tactical missile.

Cancellation of the Falcon air-to-air missiles scheduled for the F-106, also cancelled as noted above.

Cancellation of the North American Navaho supersonic intercontinental missile.

Senatorial questioning about the directives centered on an anomalous Administration position. On the one hand it was trying to prevent cuts in new appropriations and, on the other hand, simultaneously directing spending cuts in funds that had already been appropriated or were included in the FY 1958 requests. Assistant Secretary of Defense (Comptroller) Wilfred J. McNeil was asked whether it was not "a little fantastic for the Administration to come up to Congress to get restoration of budget cuts at a time when they had just issued a memorandum stating in effect that the appropriations approved in FY 1957 were not needed." To this question, neither Mr. McNeil nor any other Defense Department spokesman could provide an answer.

The real answer was that the Administration had painted itself into a fiscal corner with the only exit into a figurative fiscal closet. Military spending, instead of leveling off at the annual ceiling of $38 billion which the Administration was committed to, was proceeding at an annual rate approaching $42 billion. Expensive weapon systems, including the ballistic missiles, are coming along much faster than expected. This fact, coupled with Mr. Wilson's continuing insistence on shortened lead time, meant that more bills were coming due in a given fiscal year than the Administration proposed to pay. For if actual expenditures exceed actual cash income, the budget is out of balance and it had been promised that this would not happen. It also means deficit financing (government borrowing) and a possible rise in the debt limit, also anathema to the Administration.

This should not have come as a shock, either to Mr.

Wilson or Mr. McNeil. In fact we are told that Mr. McNeil's own office repeatedly warned Mr. Wilson that the cutting of lead-time would inevitably lead to a hump in spending. But the Defense Department kept rolling up the rug in front of itself until it hit the wall.

Unfortunately, no evidence was produced on Capitol Hill to indicate that the military effects of reduced spending had even been considered before the directives were issued. Mr. McNeil who, as Defense Department Comptroller, is the acknowledged fiscal expert in the Pentagon, admitted as much. Persistent questioning by Senator Symington elicited the alarming admission that Mr. McNeil did not know what effect the directives would have. Faced with a choice of appearing disloyal to his boss's directive or of appearing incompetent in his job, Mr. McNeil loyally took the second alternative.

In other testimony, and in an attempt to justify in part the Wilson directives, Mr. McNeil accused the Air Force of engaging in unsound fiscal practices and of violating procedures based on Defense Department understandings with the Congress. This was flatly denied by Secretary Quarles, who said that Air Force procurement practices and procedures were proper, ethical and, in his judgment, sound.

Mr. McNeil admitted that the defense programs outlined in the President's budget and promised in DOD testimony before the Congress, could not be accomplished as rapidly as presently scheduled without exceeding the Administration's spending ceiling. He left no doubt that defense spending would have to be tailored to the $38 billion ceiling set for FY 1958 and indicated that the Defense Department had been told so in no uncertain terms.

In summary, on the final day of Mr. McNeil's testimony, Senator Symington put it this way:

"There has been no evidence given the Congress that the Soviet military menace is lessened. In fact, the contrary is true. Since the President presented his defense program—the minimum number of divisions, ships, aircraft, and missiles he needed—the Congress has been informed that we face the greatest threat in ten years.

"But, in order to attain a fiscal position, to keep the promise of a balanced budget, we have discovered in these hearings that the promise of defense strength is being broken—through, until these hearings, what were secret fiscal devices.

"The Deputy Secretary of Defense has now agreed that there are only three roads out of this financial imbroglio: (1) permit defense expenditures to rise so we can have the defense strength promised; or (2) cut down the level and the modernization of our armed forces to meet fiscal ceilings; or (3) slow down or stretch out over a longer period of time the modernization process.

"Mr. Chairman, the President should tell the American people and the Congress *now* which alternative he chooses. This should be done before the Congress takes any final action on the budget."

In the short haul these may indeed be the only alternatives. But in the long run we must part company with this analysis. We believe that there is a fourth alternative, one which should be tried before the nation resorts to such drastic devices as Mr. Wilson's directives. That is a hard look at our over-all defense organization with a view to a realistic reorganization based on the jobs to be done, with the ultimate aim of true unification of our military structure. If there are to be limits on military spending then we must ensure that we spend the money in the wisest possible way and the place to start is by eliminating waste, duplication and obsolete weapon systems and concepts.

In this connection, it is interesting to note that neither the Army nor the Navy has raised a voice against the spending ceiling. It may be fair to assume, therefore, that their military capabilities have not been placed in jeopardy by Mr. Wilson's maneuver and that their programs might just have contained a fair proportion of fat to begin with.

The blunt truth is that, under spending ceilings, it is not possible for this nation to prepare to fight all kinds of wars in all kinds of places, including World War III. If there is a limit on the money then there must be a limit on what we spend it on. This calls for hard decisions of the type this Administration and its predecessors alike have been reluctant to make.

It is passing strange that these cuts in military force are coming at a time when the nation is sitting at the disarmament table. Disarmament is a noble aim but let us begin it realistically on a *quid pro quo* basis and not achieve it unilaterally by fiscal fiat.—END

★ Cordiner Legislation Up to Congress

AT press time the fate of the legislation based on the report of the Cordiner Committee on military compensation was approaching a climax. After Pentagon-sponsored legislation had been rejected by the Bureau of the Budget, three sparate but identical bills had been introduced in an effort to rescue the Cordiner recommendation. One, S. 2014, was co-sponsored by Democratic Senator Stuart Symington of Missouri and Republican Senator Barry Goldwater of Arizona, as reported on this page last month. It was hoped that hearings on this bill would be under way shortly after mid-June. In addition, Republican Representative James E. Van Zandt of Pennsylvania had introduced H. R. 7574 in the House of Representatives and Democratic Representative Stewart L. Udall of Arizona had introduced H. R. 7642. A big factor as to whether all or any of these bills got out of committee would be the indications of voter interest received by Congressmen and Senators. AFA respectfully urges its readers to write to their Congressmen and Senators in support of the badly needed legislation.

Last month we reprinted a speech by Senator Symington in support of the Cordiner proposals. Herewith is a recent speech on the House floor by Representative Van Zandt which, we believe, cogently presents valid reasons for supporting the bills identified above. Said Mr. Van Zandt:

"Mr. Speaker, I speak for economy. Not for the kind of economy which whittles and slices at this or that appropriation bill with hoping and longing to save a few million dollars. No. I speak for long-term continuing, self-perpetuating economy which will save many billions of dollars while at the same time paying a bonus of increased national defense . . .

"Recently I introduced H. R. 7574 to change the method of computing basic pay for members of the uniformed services. Founded on the recommendations of the Defense Advisory Committee on Professional and Technical Comsensation—the Cordiner Committee—the bill is aimed at instituting a modern concept of military pay and concurrently achieving the greater combat effectiveness of our defense forces.

"I do not claim this as the bill to end all military pay bills or that it is the panacea for all the manpower problems of our armed forces. It is also not a patchwork and piecemeal approach to a problem which cannot be solved in small parts but which must be treated as one inseparable whole. My bill is a beginning and a basis for us, the Mem-

(Continued on following page)

bers of Congress, to take the greatest step toward real economy. As the Committee Chairman, Mr. Ralph J. Cordiner, said, 'We must begin somewhere to halt and reverse the inflationary trend toward ever higher costs of government, and here for a small initial investment, is a very promising place to start.'

"On May 14, 1957, President Eisenhower addressed the nation on the size of the budget. He emphasized the gamble involved in reducing that portion which contributed to national security, and specifically to that part allotted to the Department of Defense. Relief from world tension, he said, is about the only way to reduce military spending. The statement is absolutely true when applied to the quantity and quality of arms and equipment we must have to maintain our edge of strength over the Soviet Union and international communism. But the statement is partially misleading when applied to the personnel who use those arms and equipment. Let me explain this paradox.

"Today, 2,800,000 men and women make up our armed forces. Not all of these are engaged in supplying direct military defense for the country. Roughly 500,000 members are involved in formal training activities, while other hundreds of thousands are undergoing on-the-job training in operational units. This trainee force is a corps of amateurs in an otherwise professional organization. If the time should come when our Army, Navy, Air Force, and Marine Corps were thrown into combat—and let me say that there will be little warning—those trainees would be of little or no help to the effort.

"It is taking 500,000 trainees just to maintain an effective combat force and to support the services of 2.3 million. In other words, twenty-two percent of our personnel strength is noneffective, not combat-ready. Why is this so? Because of the high turnover rates in professional and technical skills. Because these skilled people leave the services and obtain employment with higher wages in companies working in fields related to techincal military specialties. The armed forces are creating and maintaining an expensive training ground for industry. Not only this, but the turnover is costing the country not less than $2 billion a year.

"The implications are obvious. This is a poor business practice, inefficiency. Any good businessman will tell you that a twenty-two percent personnel loss is poor employee utilization; it is nonproductivity and waste.

"One of the country's outstanding businessmen, Ralph J. Cordiner, president of General Electric, has pointed out the guidelines for not only eliminating this waste but for improving the combat effectiveness of the services as well. Our objectives, he says, are first, to offer genuine incentives in order to retain the high quality officers and enlisted men in the services and thereby second, to build a professional force.

"Ours is a country of free enterprise. Here the individual citizen is our prime concern. In this democratic atmosphere our people have the opportunity to develop their talents and are free, even encouraged, to go to those jobs or positions which offer them higher pay and greater benefits.

"Human motivations must be recognized. Among them patriotism is a strong force. Fortunately for the nation, patriotism has held many of the dedicated and devoted in the armed forces during peacetime and given us their great leadership in time of war. Patriotism is, however, a nebulous thing, manifesting itself most frequently in times of crisis. Cold wars do not have the impelling force of a crisis, and patriotism is pitted then against compensation.

"The compensation practices in the services today are contrary to human motivations. They were adopted from the British Navy in 1812, and are as outmoded now as the 1812 navy itself. Without a doubt, those practices are the major impediment to national security.

"The more of the 2.3 million trained people we can induce to remain in the services, the fewer trainees we will need to build a professional force. In fact, this professional force can be achieved only by increasing the retention rate. Expensive as it is to build and maintain, the professional force is by far the cheapest and more effective in the long run. Rather than composed of members forced by law to serve, it will be made up of career-professional members wanting to serve.

"The problem in its basic form is manpower. Manpower is mindpower, brainpower. The human brain still remains the inventing and guiding force behind the machine. And never can the machine substitute for man. As one of our Air Force leaders said, 'You can't build creative ability into a machine. You can't design a circuit to take the place of courage. Above all, you can't enclose dedication to freedom in a magic black box.' Plainly, then, our most precious national resource is our men and women.

"The manpower problem, and the coordination of manpower and machines, is our most compelling concern. It is more important than providing increasing amounts of money for complex equipment because that equipment becomes only a metallic heap when trained hands are not available to use it.

"This bill will provide a long-term solution to the basic manpower problems of the armed forces.

"It will result in about a fifteen-percent improvement in the combat capability of the armed forces.

"It will bring about sharp reductions in training accidents now, and in military and civilian losses in the event of war.

"It will reduce the number of military personnel required to produce a given level of national security.

"Finally, and significantly, it will result in savings up to $5 billion annually by 1962, in the cost of producing our present levels of combat capability.

"Let me pronounce again, the purpose of the bill is to change the method of computing basic pay. Those who believe that this is nothing more than a general pay raise for military personnel have been misled by misinformation. If they see the bill as inflationary, they are incorrectly reading the label. This is a bill for readjustment pay computation. It is a bill for increased management efficiency and for savings. It is a bill for reducing the cost of defense, the largest single item in the federal budget.

"The Cordiner report upon which my proposal is based has received the approval of the Secretary of Defense, the Secretaries of the three military services, and the Joint Chiefs of Staff. The Department of Defense has even agreed to absorb the entire cost of the program for the first year without an increase of its budget.

"Failure of the Congress to act on this manpower and defsne problem will have dire consequences. Those members of the armed services who have been waiting for this pay adjustment, and who have remained in service expecting it, will find no further cause to remain. Enlistments will drop sharply. Officers in large numbers will ask for release. Combat efficiency will decline with the shrinking of what we now have to a professional force.

"I urge immediate action on this proposal. I ask that we not be penny-wise and pound-foolish, but that we recognize the long-term investment in annual savings of billions and in increased combat effectiveness. I ask that we think big and act boldly. This proposal is not limited, idealistic, or unsound. It is broad in scope, realistic, and purely economical.

"The nation's security is at stake."—END

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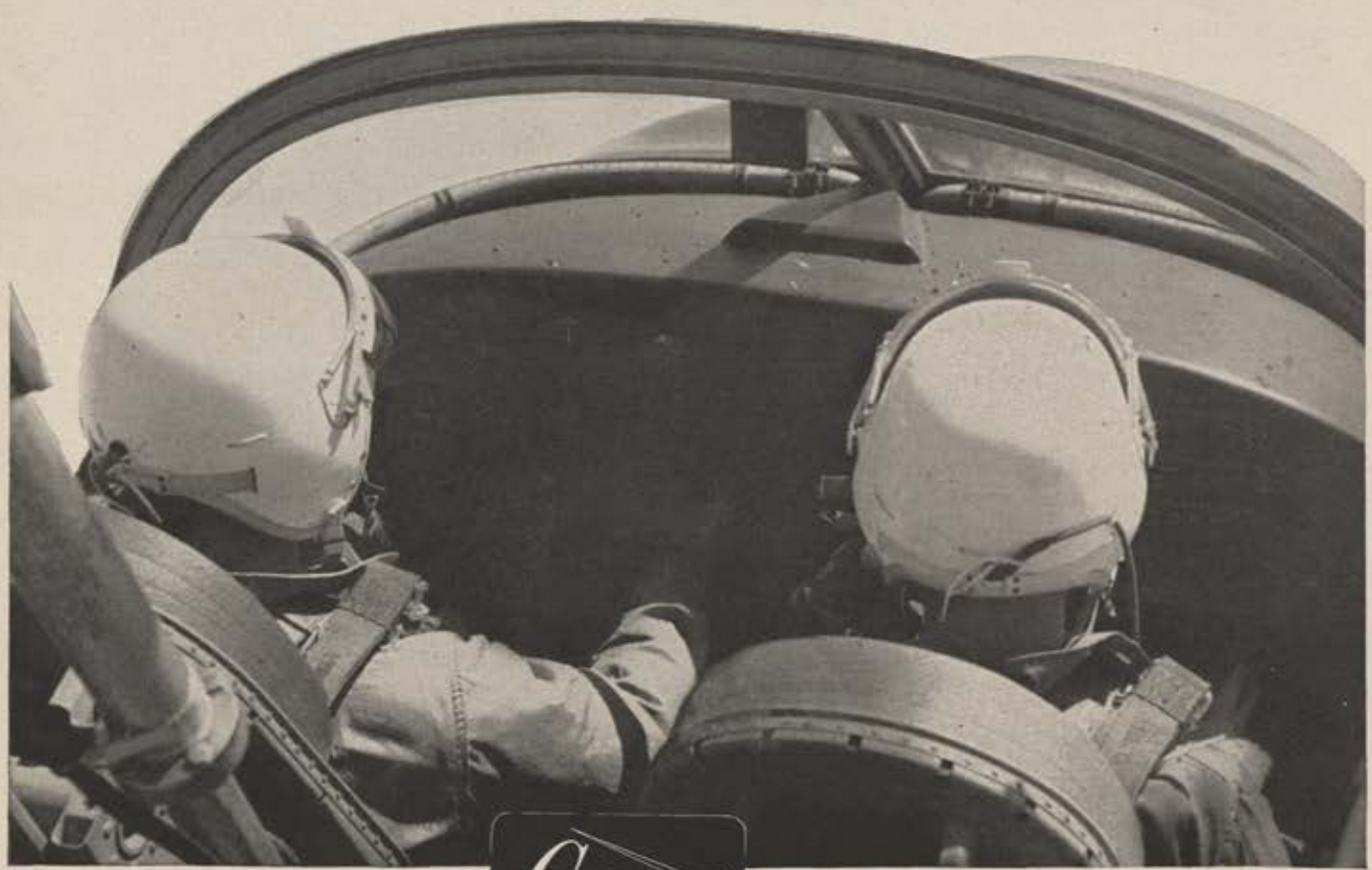

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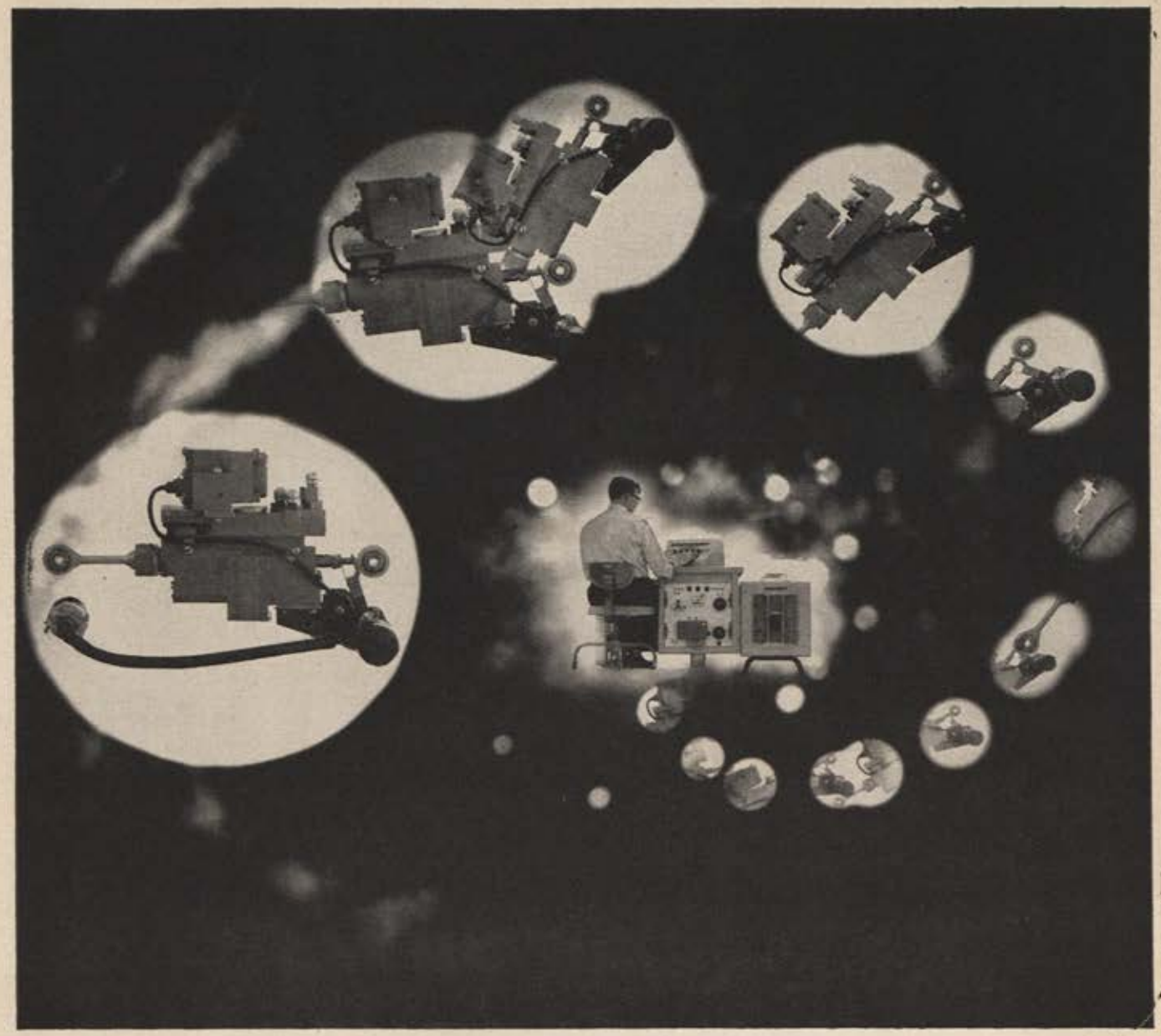

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SHOOTING THE BREEZE

WITH THE EDITORS OF AIR FORCE MAGAZINE

We are proud and happy to announce that the Air Force Association has been given the 1957 Public Relations Award of the Aviation Writers' Association. The award was given in recognition of what the Association's award committee termed "the outstanding job of public relations in the field of aviation" and was based on AFA's series of national, regional and local Jet Age Conferences dealing with the problems of the Jet Age. The award was presented at the annual banquet of the Aviation Writers' Association at AWA's convention in St. Louis, Mo., on May 31. The presentation was made by George Rhodes, aviation editor of the San Francisco *Examiner*, chairman of the awards committee. (At the same convention Rhodes was elected president of the aviation writers' group.) J. Chesley Stewart of St. Louis, midwest regional vice president of the Air Force Association, accepted the award on behalf of AFA. It should be most gratifying to all Association members to receive the top public relations award in the aviation field. It is even more gratifying that the recognition should come for a program that, probably as much or more than any the Association has undertaken, represents the concerted efforts of AFA members and units across the nation.

☆

In last month's Breeze we ran an item from the United Press telling how a group of prankish Australian students dressed as pirates "captured" a US carrier at anchor in Sydney harbor. A waggish gentleman of our acquaintance called to give us his personal reaction to the news with this comment: "What did they want with it?"

☆

In an impish mood recently, Ralph Whitener, AFA's program director, dispatched this wire to Al Harting, who will be Chairman of the 1958 AFA Convention in Dallas, Tex.:

"BEFORE TEXAS WASHES AWAY, PLEASE PUT ENOUGH LAND IN DRY STORAGE TO HOLD AFA'S 1958 CONVENTION. GLAD TO KNOW WE WILL HAVE WATER WITH OUR BOURBON."

Apparently the Texas heavy rains and floods have not dimmed Al's gift for repartee, as this answer was immediately flashed back: "RELAX. JUST TEXAS-SIZED WASH JOB. ROUTINE BEFORE ALL MAJOR CONVENTIONS."

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The Russians, who've claimed nearly every big development in history, are at it again. Now they claim an H-bomb so big that they dare not test it. Communist Party boss Nikita Khrushchev told a group of Polish journalists the Soviet bomb was so big that it "couldn't even be tested inside the vast area of the Soviet Union."

As a matter of fact, the bomb is so big, he went on, "We couldn't even test it in the Arctic because it would melt the icecap and send the oceans spilling over the world." And, as usual, the Russian timing was magnificent. The announcement, which also said, "one bomb would be enough for England and France," coincided very neatly with the British H-bomb tests in the Pacific.

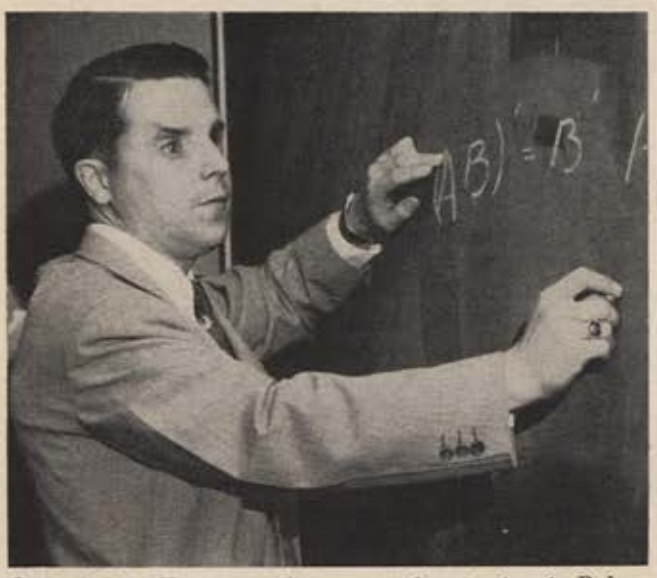
While on the subject, that British H-bomb has been reported as equal to five million tons of TNT. It was dropped from a British Valiant jet bomber and timed to explode at 10,000 feet to reduce radioactive fallout. An observer described the blast as "a ball of flame like a world on fire." The shock wave from the blast was visible as a black streak and set off possibly the loudest man-made thunder ever created. A select number of British journalists witnessed the explosion. Said Chapman Pincher of the *Daily Express*,

☆

The last of the flying sergeants—M/Sgt. George Holmes—has retired, leaving only officer pilots in the Air Force. Sergeant Holmes, fifty-nine, was one of fifty-five enlisted men authorized to pilot military planes in 1935. The War Department eventually stopped non-com flight training.

(Continued on following page)

BJ Electronics, a facility of Borg-Warner Corporation, Santa Ana, Calif., has supplied us with our Breezecake girl for July. She's holding two miniaturized, high-sensitivity instruments used in flight-testing the Convair F-102. In her right hand is an amplifier, while in her left hand is a two-ounce electronic sensing device called a "Vibrotron Absolute Pressure Transducer," which can measure altitude and airspeed through changes in the tension exerted on a 2½-inch wire about as thick as a human hair. Both instruments were developed by BJ Electronics.



One of the AF's outstanding research scientists is Robert A. Bottenberg, blinded during WW II. Now an ARDC research psychologist at the Personnel and Training Research Center at Lackland AFB, Tex., he has just received his Ph.D. degree in psychology from Stanford University. Here Dr. Bottenberg is conducting class in matrix algebra.

and the number gradually diminished. With more than 9,000 flying hours, Sergeant Holmes had flown just about every type of Air Force plane, except jets.

☆

Guards at SAC's new control center at Offutt AFB, Nebr., have been spruced up with new uniforms. The hand-picked crew of six-footers now sports blue felt berets adorned with a miniature SAC insignia, chrome-plated belt buckles, and bone-handled .38-caliber pistols in shiny black cross-draw holsters.

☆

We're happy to receive and pass along the official and ungarbled word on the correct use of the terms, "Weapon System" and "Air Warfare System." We can't remember when new terms have confused so many people so often . . . including us. But this excerpt from The Inspector General Brief *should unmuddle the situation:*

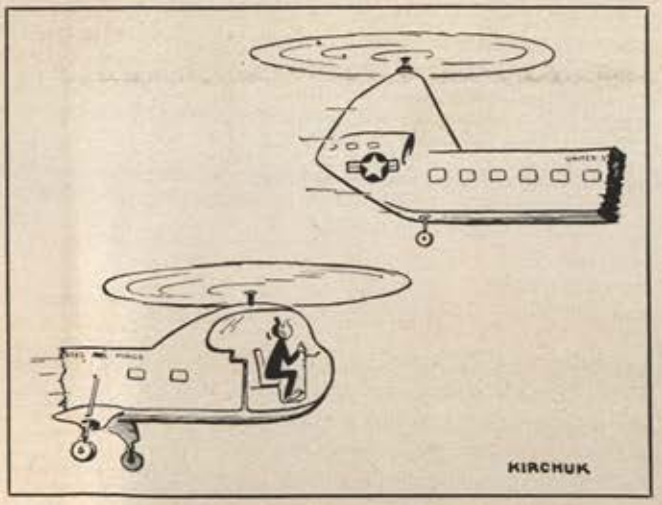
"There still appears to be considerable misunderstanding within the USAF of the proper use of the term 'weapon system.' The Air Force is committed to the weapon system concept as a device of management. This term is being used more and more frequently and its meaning should be clearly understood by all Air Force personnel. In particular, those involved in any aspect of USAF development and procurement activities should appreciate the significance of 'weapon system'—as a term and as a concept.

"Occasionally, the expression weapons system is employed erroneously to denote a single 'weapon system,' or the entire inventory of weapon and support systems of a particular major air command. The combat and support equipment of a major air command is properly termed the 'air warfare system.' The following definitions should clarify the meaning of both terms:

"**Weapon System.** A weapon system is composed of equipment, skills, and techniques, the composite of which forms an instrument of combat, usually but not necessarily, having an air vehicle as its major operational element. The complete weapon system includes all related equipment, materials, services, and personnel required solely for the operation of the air vehicle, or other major element of the system, so that the instrument of combat becomes a self-sufficient unit of striking power in its intended operational environment. (AFR 80-30)

"**Air Warfare System.** The integrated total of weapon and support systems and operational support equipment peculiar to or employed in the performance of the designated mission of a major operational command. There are three Air Warfare Systems: Strategic, Defense, and Tactical. (To be published shortly in a new AFR 80- series Regulation.)

"*In Air Force terminology, there is no instance in which 'weapons system' may properly be employed.*"



☆

New president of the National Aviation Education Council is Dr. K. Richard Johnson, of Evanston, Ill., who is president of National College of Education.

☆

The AFA Flight Pay Protection Plan (*see page 80*) has been in existence just over a year now. During that time we've received a variety of letters from flying personnel who have been removed from flight status for various lengths of time. Some had the protection of AFA's unique flight pay plan. Others weren't so fortunate. We think you'll find this short story interesting, although it does not have a happy ending. Need we say it was written by an Air Force captain, who did *not* have AFA flight pay protection?

It Can't Happen To Me

This can be made an extremely short story by saying—It did! However, if you are curious read on:

It has been several months now since advertisements made their appearance on the worthiness of insurance to protect flight pay. These I immediately passed off without a thought. A little later, as friends brought up the subject, I was prone to rationalize that such a program was for old men worrying about varicose veins and gout—and it couldn't happen to me. Besides, I was already insurance poor. It was not long before any small thought that may have existed was completely forgotten in the cares of the day.

One of these cares led to my return home from headquarters late at night. My car happened to occupy a space that another wanted to cross as it hurried through a stop sign, lights out, in an endeavor to escape from an accident. Although that car could not quite fit through the door of

(Continued on page 39)

ORENDAS...

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IROQUOIS,
Orenda's supersonic design.

ORENDA ENGINES LIMITED
MALTON, CANADA
MEMBER: A. V. ROE CANADA LIMITED & THE HAWKER SIDDELEY GROUP

"An infinite capacity for taking pains"

The above familiar phrase is usually given as a definition of genius. We borrow it as a job description.

The lengths to which our Quality Control people go, to insure the reliability of our complex products, are truly painstaking, and are applied equally to components we make ourselves and those we purchase from outside suppliers.

For example, consider vacuum tubes, the heart of hundreds of projects in our Electronics Division. No spot check satisfies here (even if that's all our customer specifies)—but a whole series of critical tests, including such precise evaluations as these:

Inspection of tube characteristics to rigid Stromberg-Carlson specifications—performed on special equipment which can do in a half-hour what would take days on conventional testing devices.

Inspection by X-ray, looking for deeply hidden potential faults which could cause malfunction at any time after first use.

Inspection by microscope, seeking welding faults, minute cracks in glass, and even infinitesimal loose particles inside the tube.

And tubes are only one concern. *All* components must pass similarly rigid tests, to assure operating performance, ruggedness and reliability in the completed equipment.

You can't put a price on "taking infinite pains." You *can* place your confidence in a company where this is everyday procedure.

S-C STROMBERG-CARLSON

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General Offices and Factories at Rochester, N. Y.—West Coast plants at San Diego and Los Angeles, Calif.

GD GENERAL DYNAMICS

my car, it reached me to the extent of nine rib fractures, seventy-nine stitches in head and face, bruised heart, punctured lung cavity, and many smaller bruises and cuts.

Hospital and convalescent leave sped by, and the return to duty was closely followed by a request to return to flying status. There was still no problem on pocketbook, but by the time the paperwork bounced a bit, and I learned that regulations precluded the recoupment of past months' flying pay after ninety days from date of grounding, the proverbial barn door was closed. As much as I wished it, my flying pay has gone for three months, and this can be projected for several more. I am afraid I am accustomed to spending more than my pay without the flying portion, and with a new baby, and a new house there is a sudden and a difficult adjustment taking place. If I had only . . . !

But why should I worry you with my problems, since everyone knows it can't happen to you either.

ROBERT E. L. DAY
Captain, USAF
Deputy AF Plant Representative
Warner Robins Air Materiel Area
The Glenn L. Martin Company
Baltimore 3, Maryland

We're grateful to Brig. Gen. Edward J. Tracy, AMC Surgeon, who asked Captain Day to send along this article, "with the idea that it may prevent others from finding themselves in the same boat." See page 80.

☆

In the same vein but on a happier note, is this extract of a letter from Lt. Col. James T. Cousin, who *did* have flight pay protection when hospitalized and removed from flight status. He wrote us:

"The one thing that has probably impressed me more than any other is the promptness with which my claim has been processed. In the past I have owned various hospitalization and accident policies on myself and my family, but the receipt of benefits so promptly and with such graciousness was a welcome change from the usual amount of red-tape investigations associated with hospital and accident insurance claims."

If you're on flight status now or expect to be, you owe it to yourself and your family to examine the details of the AFA plan explained on page 80 which make it so simple and inexpensive to have this extra protection.

☆

Joseph Schaller, 22, German immigrant and son of a former Luftwaffe pilot, doesn't believe in letting marriage interfere with his career. He was so happy at being accepted for enlistment by the Air Force that he insisted on foregoing his honeymoon. His bride Ruth, took an equally patriotic view, or so said the news report.

☆

August is a popular month for reunions. In addition to many planned and impromptu reunions which will take place during AFA's National Convention in Washington, the following get-togethers are also on tap: **The Tenth Troop Carrier Group** will hold its fourth reunion August 25 at Wright-Patterson AFB, Ohio. Joe Cull, Secretary, 1848 Wesleyan Rd., Dayton, Ohio, has full particulars. . . . Alumni of the **385th Bomb Group** are urged to contact R. G. Weikert, 719 Chamber of Commerce Bldg., Indianapolis, Ind., regarding their August reunion. . . . The **22d Bombardment Group** will hold its eighth annual reunion at the Hotel Governor Clinton in New York City on August 10. For further information, write Milton Weiner, 50 East 42d St., New York 17, N. Y. . . . A three-day reunion is planned for the eleventh annual reunion of the **12th Armored (Hellcat) Division Association.** Dates are August 1-3 in Cleveland's Hotel Carter. The contact is Leroy W. Benzel, 2557 Main St., Lawrenceville, N. J. . . . The **Second Air Division, Eighth Air Force,** will stage a two-day get-together August 16-17 in Hershey, Penna. For full details write R. W. Clough, 802 Philadelphia Pike, Wilmington 3, Del.

☆

AFA's selection of Cincinnati broadcaster DelVina Wheeldon for an AFA Citation of Honor at last year's New Orleans convention looks positively prescient now. In late April Mrs. Wheeldon, known to WCKY listeners only as "DelVina," won *McCall's* magazine's coveted "Golden Mike" as the lady broadcaster who did the greatest service for women during 1956. The *McCall's* award (and AFA's) recognized a series of broadcasts based on her experiences as the first woman passenger to pierce the sound barrier, in an Air Defense Command Lockheed F-94C Starfire.—END

That's a supersonic smile if we ever saw one. Beneath the grin is DelVina Wheeldon, a 1956 AFA Citation of Honor winner, who's now won McCall's "Golden Mike" award.

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...Push Button Guidance

FOR THE REGULUS

Shipboard radar, designed and produced by Fairchild Guided Missiles Division, makes possible the completely automatic guidance of the Regulus. Push-button operation contrasts the engineering complexity of this uniquely accurate guidance system. So versatile is its installation and adaptability, the Fairchild SPQ-2 radar system is now in operation with the fleet around the world.

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

AIR FORCE
JULY 1957

Milt Caniff's Air Force

How's your Caniff IQ? Can you identify these seventeen characters? They're all based on real people, a story we tell on the next pages. Here's the run-down, top row first, left to right: Poteet Canyon (Nancy O'Neal of Houston, Tex.); Dude Hennick (Frank Higgs, who was killed over Shanghai after the war); Col. Flip Corkin (AF Col. Philip Cochran); Lt. Upton Bucket (Bill Mauldin); Col. Vince Casey (AF Brig. Gen. C. D. Vincent, who died in 1955 alone in his room at Colorado Springs); CAP Cadet Scooter McGruder, a new character who'll appear in "Steve Canyon" this fall (Margaret Kennefick of St. Louis); Allee McDean (Alice McDermott); Maj. Gen. Claire L. Chennault (portraying himself); Steve Canyon (a "composite," Mr. Caniff tells us); Gen. Joseph W. Stilwell (portraying himself); Lt. Taffy Tucker, USANC (Lt. Bernice Taylor, USANC); Miss Lace (Dorothy Partington); Maj. Luke Adew, USAF (Maj. William Lookadoo, USAF); Col. Soup Davey (Maj. David F. McCallister, USANG); Lt. Peter Pipper "the Piper" (Sen. John C. Kennedy); Brig. Gen. P. G. "Shanty" Town (Brig. Gen. C. D. Vincent); and Miss Mizzou (originally Marilyn Monroe, later Bek Stiner).

By James H. Winchester

SOMETIME this fall, a bright-eyed, snub-nosed, pert and pretty young lady with the infectious name of Scooter McGruder will make her initial appearance in Milton Caniff's widely distributed comic strip "Steve Canyon."

Like more than two dozen other characters who have appeared in regular or transient roles in "Steve Canyon," or in Caniff's earlier strip "Terry and the Pirates," Scooter is based on a real-life personality.

In this instance she's actually Margaret A. Kennefick, a Civil Air Patrol cadet from St. Louis, Mo. Her comic strip name of Scooter is derived from the fact that she's a bundle of jet-propelled energy, continually scooting around, talking real fast all the time.

Caniff, always on the alert for new types to lend color and authenticity to his drawings and continuity, spotted Margaret in a photograph when she was named "Miss Civil Air Patrol of 1957." He contacted her, asked her if she'd like to pose and—well, you'll be seeing a lot of Scooter in the months ahead.

The fabulous Steve Canyon, hero of the Caniff strip which is read by more than 30,000,000 persons around the world each day, is probably the most widely known lieutenant colonel in the United States Air Force. Steve is pure fiction, conceived in Caniff's fertile imagination. But many of the people with whom Steve associates come from real life.

For instance, do you remember that macabre final panel in "Steve Canyon" last year, the one which announced that "General Shanty Town" was dead? He had worked so hard for the security of his country as a dedicated Air Force officer, he was as real a casualty to preservation of the peace as if he'd been killed in combat.

Overwork did it.

Meet Scooter McGruder (right), who'll appear in "Steve Canyon" comic strip this fall, modeled after CAP cadet Margaret Kennefick, here with Milt Caniff.

In creating "General Shanty Town" and telling his story, Caniff wrote an epitaph on America's conscience and consciousness that there was a real man, an Air Force officer, who had come to his end this way.

"General Shanty Town" was no mere figment of pen and ink. He was actually modeled by Caniff on the late Brig. Gen. Clinton D. "Casey" Vincent, who got his star in World War II when he was only twenty-nine.

General Vincent died alone in his room at Ent Air Force Base, in Colorado Springs, Colo., July 5, 1955, the same day he had reported to be the new Deputy Chief of Staff for Operations of the Continental Air Defense Command. He was forty years old.

General Vincent left behind an attractive widow, Peggy, their three daughters, and a son.

With the help of Caniff, his long-time friend and admirer, he also left behind an inspiration.

It was in Milt's "Terry and the Pirates" strip on April 7, 1943, that Caniff's readers first met "Ol' Vince Casey" out in China with Maj. Gen. Claire Chennault's Flying Tigers of the Fourteenth Air Force. Casey Vincent's switched-around name then ran through the "Terry" strip all during the World War II years.

After Vincent's death, Caniff re-created him again—this time as General Town, who worked hard and constantly to keep his part of the Air Force razor-sharp in effectiveness. The strip voiced some of the public apathy in its references to those who questioned the general's drive because we were "at peace." One of the cartoon panels carried this rebuttal:

"Pearl Harbor wasn't important either—until December 7, 1941!"

Last year when the Air Force base at Yuma, Ariz., was rechristened Vincent Air Force Base—after the real-life General Vincent—Milton Caniff was one of the dedication speakers.

By special permission Chicago Tribune-N. Y. News Syndicate

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The late Brig. Gen. Clinton "Casey" Vincent (left) was the model for Caniff's "Ol' Vince Casey" in "Terry and the Pirates" comic strip during World War II, later showed up again in "Steve Canyon" as "General Shanty Town" (right).

Another well-known character in "Steve Canyon" is "Soup" Davey, an Air Force jet fighter pilot. Actually, "Soup" is based on the real-life Maj. David F. McCallister, commanding officer of the 142d Fighter-Interceptor Squadron of the Delaware Air National Guard. McCallister, a World War II pilot, has been a friend of Caniff's for years and his appearance as "Soup" in the strip grew out of this friendship between the two men.

McCallister, who lives in Swarthmore, Penna., with his wife and six children, also served Caniff for the original inspiration for that lovable, repressible pair—Lt. Upton R. Bucket and Pipper the Piper—are actually based on cartoonist-writer Bill Mauldin, a neighbor of Caniff's in New City, N.Y., and US Sen. John Kennedy from Massachusetts.

In most instances Caniff draws his characters from real life or pictures. However, in the case of Steve Canyon's kissin' cousin from Texas, Miss Poteet, he reversed this procedure. First, he drew his conception of what Poteet should look like. Then, the Houston *Post*, one of the several hundred newspapers around the world which carries the daily and Sunday old curtains, and such, don't fit the new quarters, so you buy replacements instead of that new dress.

"You try to forget . . . the wedding gifts broken in the turmoil of transfers . . . the kids change school so often they are ahead of the class in one place and behind in another . . . and the four snow suits bought on sale in New York are no bargains in the trunk in Panama!

"A cross-country move with pay is fine—except when, like ours, the kids come down with measles and you park in a motel for days and go $300

(Continued on following page)

Caniff's inspiration for "Soup" Davey (above) and, earlier, for Lt. Charles Charles was ANG Maj. David F. McCallister.

laughable fly boy, Lt. Charles Charles.

A caterer, when he isn't out with his Air National Guard unit, McCallister was the winner in 1956 of the Air Force Association's Earl T. Ricks Memorial Trophy. Flying a North American F-86 Sabrejet, McCallister covered the 1,922 miles between Hamilton AFB in California and Moisant International Airport, New Orleans, in three hours, thirty minutes, and eight seconds—an average speed of 547.68 mph.

McCallister is also one of this magazine's authors. His "Goof a Little" appeared in the June '57 issue of AIR FORCE.

Another real-life Air Force character who pops up from time to time in the "Steve Canyon" story-line is Maj. Luke Adew—a cartoon personality based on Maj. William J. Lookadoo, who is now the Information Services Officer of the 26th Air Division at Roslyn, L.I., N.Y.

Then, of course, everyone knows that the famous Col. Flip Corkin of "Terry and the Pirates" was based on the real-life Army Air Corps Col. Philip G. Cochran, who headed up the aerial commandos in Burma during World War II.

Not all of Caniff's characters, of course, represent present or past members of the Air Force. Many were old-time pilots with CNAC, the China-based civilian airline. Others are straight out of civilian life. That ir-

"Steve Canyon" strip, ran a contest to find a live counterpart. More than 400 girls sent in their pictures. The winner was nineteen-year-old Nancy O'Neal.

Incidentally, it was Arthur Laro, managing editor of the *Post*, who suggested the name "Poteet," borrowing it from a strawberry-growing town on the Gulf Coast of Texas.

Almost as famous now as the message that Col. Flip Corkin gave Terry when he got his wings, is the talk that a girl named Allee McDean gave Steve Canyon last December when he was undecided about staying on in the Air Force.

"Steve Canyon, do you mean to say you're having trouble deciding whether to stay in the Air Force or take a fat salary as an actor?" Allee asked Steve.

"That's it, Allee!" Steve answered. "I have no one like you to ask for advice, but as an Air Force wife you probably have an opinion on the subject."

The girl sure did!

"Yes," she replied, "it is different for a wife! My initial shock was being unable to cash a check at our first station . . . but what's old money? We had free medical care and our first child was born in a forty-five-bed ward that was only two-thirds filled.

"The children's braces are just in place when you move . . . which means a new dentist! New schools, new friends, and a new church . . . the

USAF Maj. Bill Lookadoo provided the face and name for "Maj. Luke Adew."

One of Milton Caniff's best remembered strips was back in '43, when Col. Flip Corkin (in real life, right, Col. Philip G. Cochran) gave some advice to Terry, who'd just won his Air Force wings.

over your allowances! But then I look great in a cloth coat!

"I haven't mentioned the social rebuffs we sometimes get—or the constant haunting fear that at this moment your man may be lying dead in a pile of smoking, twisted metal.

"But, I've beat your ear enough! Be seeing you.

"Oh, Steve, I forgot one thing . . . I wouldn't change places with any woman in the world!"

Allee, in real life, is really an Air Force wife. She's Alice McDermott, wife of Col. George McDermott, Dean of Faculty at the new Air Force Academy out in Colorado.

And the girl who recently took Colonel Canyon on a conducted lecture tour of the Air Force Central Museum at Wright-Patterson AFB, Dayton, is from real life, too. She is thirteen-year-old Nancy Juenger, of Springfield, Ohio. Caniff spotted her one day in the Museum when he was there making background sketches. He told her what he had in mind and got her mother's permission for her to pose.

Some of Caniff's other female cartoon characters have been drawn from more glamorous real-life backgrounds.

Take Miss Mizzou, for instance—and who wouldn't like to! Well, Milt drew her from a picture of Marilyn Monroe. Later, when he needed a real model, he used a professional poser, Bek Stiner. Madame Lynx was based on actress Ilona Massey.

Many times characters in the strip represent themselves. Among these have been Arthur Godfrey, Tony Marvin, Generals Claire Chennault and "Vinegar Joe" Stilwell, and George Tucker, the late, well-known Associated Press war correspondent, and many others.

Caniff is one of the best friends and supporters the Air Force has. As Gen. Nathan Twining, the new Chairman of the Joint Chiefs of Staff, wrote recently, while he was still Chief of Staff for the Air Force:

"There's an officer in my command I'd like to tell you about. On his service record he's Canyon, Stevenson Burton, AO #041044, Lt. Col., USAFR. To his newspaper readers he's Steve Canyon, a character in Milton Caniff's comic strip. But to the Air Force he is a very important young man. I'd like to tell you why.

"In the Air Force we often think of Steve and Milt Caniff as one man. So we appreciate untold thousands of dollars worth of recruiting posters, insignia and the like that have been drawn for us free.

Bill Mauldin as Upton Bucket.

US Sen. John Kennedy became the model for the irrespressible Pipper the Piper.

Nancy O'Neal of Houston was judged closest in appearance to Poteet Canyon.

"I don't know anyone, at any level, in any service, who didn't fall in love with Miss Lace in World War II. She was everything we'd left behind —a pal and a pin-up and a laugh when we needed one. She was Milt's gift to service morale.

"Strips like Steve Canyon do several things for us. Steve is very popular with our airmen, and he has a way of putting over an idea painlessly which even our best orientation officers envy. But more important, Steve's occasional lectures put the Air Force's aims and problems and ideals before 30,000,000 American citizens who follow him in the papers. I know of no other way to tell so many people so much about us, and

(Continued on following page)

Allee McDean is Alice McDermott.

Nancy Juenger of Springfield, Ohio, showed Steve Canyon around AF Museum.

what we are, and why we are. He shows—in this sense of communication—that the Air Force isn't its own pilot; in a sense it is a tail gunner. The American people fly the plane.

"Then there was the strip that Milt did of Colonel Canyon at Indian Cape. That was a high point with us. Continental Air Defense, with its noisy jets scrambling at all hours was (and is) one of our touchiest problems. General Chidlaw invited Milt to visit a base where civilian feeling was running high. Milt talked to us and he talked to the people who wanted the base closed. Then he sent Steve out to a similar town, Indian Cape. Steve's mission: To put the blame for noisy round-the-clock jet flying and for everyone's lost sleep where it belongs—on the foreign powers who have made our continental air defense necessary.

"A related problem, and perhaps the hardest and most vital of all, is civil defense, particularly civilian aircraft spotting. You can almost always spot a high-flying plane on radar, but if an enemy ever sneaks in at tree-top level, there's only one instrument in the world that's going to see him in time—a pair of human eyes.

"While he was at Indian Cape, Steve became a little bitter about the lack of interest among the civilians whose lives he was trying to make secure. We all get a little bitter sometimes. But Colonel Canyon told 30,000,000 readers why we can't handle this country's air defense without their help.

"Milt's work isn't just for the Air Force, although that's his first love. The 'us' that he does things for is everybody in every service. And the really big thing he does is simply this:

"He tells you about us."

Caniff is no stranger to the Air Force Association. At AFA's 1953 Convention in Washington, D.C., the cartoonist received AFA's Arts and Letters Trophy and a citation honoring him for his "genius" in bringing the complex story of modern airpower to a mass audience through the daily comic strip, "presenting the airpower requirement to many millions of avid readers with great artistic skill, technical accuracy, and dramatic impact."

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Sometimes real people appear as themselves in Caniff's panels. Here's a case where Caniff, one of the best friends the AF has, "borrowed" Arthur Godfrey.

And one of the features at each AFA Convention the past ten years has been the huge "Miss Lace" poster over AFA's main registration desk, drawn especially for AFA by Caniff.

Milt Caniff himself is a big, handsome, black-haired man of fifty, who was born in Hillsboro, Ohio, has an A.B. degree from Ohio State, lives in a big, white house along the Hudson River just above New York City, and has real charm and quiet confidence.

Caniff's father was a printer and Milt smelled printer's ink early. At thirteen, attending Stivers High School in Dayton, he was an artist's apprentice on the Dayton *Journal-Herald*. While at Ohio State he worked on the Columbus, Ohio, *Dispatch*. He yearned

for the stage in those college years and played a few bit movie parts and worked in a couple of stock companies. When he was graduated in 1930, veteran cartoonist Billy Ireland of the *Dispatch* settled his cartooning-acting dilemma.

"Stick to your inkpots, kid," he said. "Actors don't eat regularly."

Milton came to New York to work for the Associated Press in 1932, drawing the comic strips "Dickie Dare" and "The Gay Thirties." In 1934, Capt. Joseph M. Patterson, publisher of the New York *Daily News*, hired him to create a new type of strip—and this turned out to be his famous "Terry and the Pirates." In 1947 he began "Steve Canyon" for the Chicago *Sun-Times* Syndicate Division of Field Enterprises, Inc. It is

At AFA's 1953 Convention in Washington, Milt Caniff accepts Arts and Letters Trophy from Jimmy Doolittle.

distributed internationally by King Features Syndicate and the Chicago *Sun-Times* Syndicate.

A slave for work, Caniff puts in from fourteen to sixteen hours a day at his drawing board, aided by his talented assistant, Richard Rockwell.

His pretty wife, the former Esther (Bunny) Parsons of Dayton, leaves him alone most of the time when he's working. On the second floor of his house he sweats out Steve Canyon's adventures, always bearing this credo in mind:

"Draw for the guy who pays for the paper."—END

About the Author

Jim Winchester is a feature writer for King Features Syndicate and is also an active freelancer. His byline appears in this magazine with some regularity, most recently with his article in last month's issue—"Watch That First Step . . ."

Is there anyone who went through World War II who doesn't remember Miss Lace? Since that time, she's attended every AFA Convention. Here's how she looked in New Orleans last year. She's modeled after Dorothy Partington, shown at left.

New Muscle for the Long Arm of SAC

BY YEAR'S end, the Strategic Air Command's timetables for instant retaliation at the far ends of the earth will undergo sweeping revision. The list of targets SAC can reach, if the need arises, will be lengthened and the time needed to reach them will be considerably decreased.

"We'll soon be capable," says a high-ranking SAC officer, "of reaching and destroying, with incredible speed, every important military target in the Soviet sphere of influence."

The source of this tremendously increased striking power is an adjunct of the Free World's Number One weapon system—SAC's B-52, the long-range, eight-jet, 650-mph bomber which last January streaked around the globe in forty-five hours and nineteen minutes. The new addition is the KC-135 Stratotanker, a sleek, jet-powered giant of an airplane which can rendezvous with and refuel the B-52 without causing the big bomber to deviate from its assigned course, speed, or altitude.

"If we had had the KC-135 last January," a pilot at SAC headquarters told me, "we could have cut four to six hours off that global flight."

Mid-air refueling from propeller-driven B-29s and KC-97 tankers has long been routine. But it is a tricky, hair-raising operation to hang a 200-ton bomber on the end of a boom fifteen yards long, then hold it in precisely the right position for eighteen to twenty-five minutes, while thousands upon thousands of gallons of highly volatile jet fuel are pumped into it from another airplane. It is a job that needs the utmost confidence, the most exacting flying skill, for it is usually done in strict radio silence, and disastrous collision is never more than a deep breath away.

I got permission from the Air Force to become the first outside civilian ever to fly in the KC-135 and went to Seattle, Wash., where the first of the new jet tankers were coming off the assembly lines at the Boeing Airplane Company.

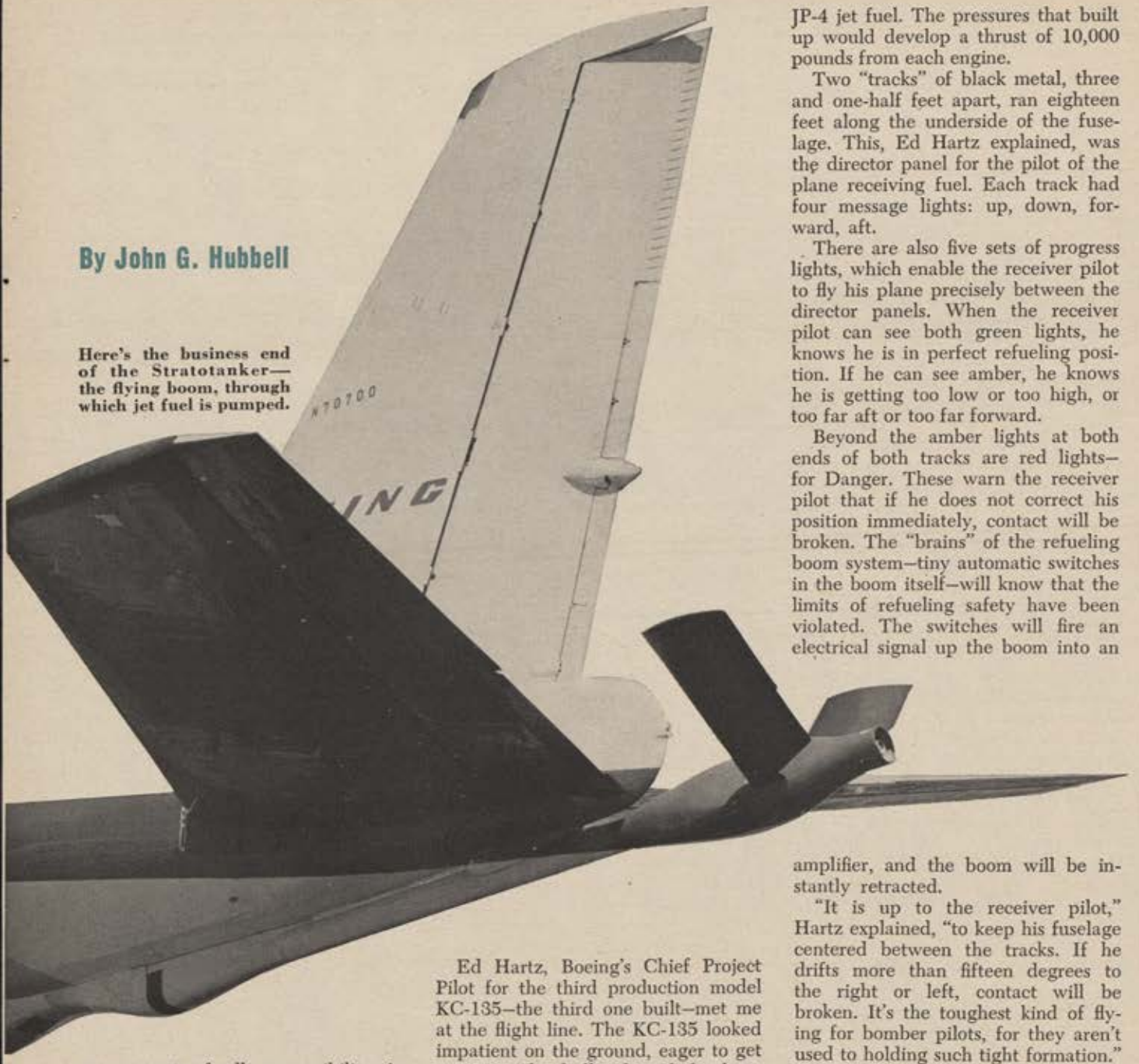
"Until now, our B-52s and B-47s have had to come down 20,000 to 30,000 feet to rendezvous with the tanker," explained Maj. Erich Schleier, chief of Air Force flight test operations at Boeing. "Even at its ceiling, the KC-97 could not always get above bad weather, and the bomber would spend a lot of time hunting around for the tanker between cloud layers. After they found each other and hooked up, in the case of the B-47 they often had to dive and keep diving to pick up speed because even when the KC-97 was at full throttle, the bomber was on the ragged edge of a stall. Sometimes, when things got too rough, they had to break contact and start over. Or, worse yet, the mission had to be aborted. It took a lot of time and it was costly."

The KC-135, Schleier pointed out, flies far above bad weather, meets the bomber at its own speed and altitude levels, expedites delivery of SAC's volcanic bomb load.

I signed a waiver absolving the

First test hook-up between Boeing's KC-135 jet tanker and the eight-jet B-52 Stratofortress took place last winter.

By John G. Hubbell



Here's the business end of the Stratotanker—the flying boom, through which jet fuel is pumped.

government of all responsibility in case of accident. A sergeant found me a flying suit, then tied a Mae West around me. Finally, I pulled the harness of a lead-heavy parachute over my shoulders.

"Try to get out of the 'chute just as you hit the water," the sergeant said, "or it will drag you down. Don't try to inflate the Mae West until you are clear of the 'chute and in the water. Good luck and don't worry," he smiled. "The ocean's warm this time of year."

Sandy McMurray, a Boeing test pilot, shouted into Schleier's office that he was leaving.

"Sandy is flying the B-52 you will rendezvous with," Schleier said. "This is the first time it has ever been off the ground." My nerves began to crawl inside me.

Ed Hartz, Boeing's Chief Project Pilot for the third production model KC-135—the third one built—met me at the flight line. The KC-135 looked impatient on the ground, eager to get moving. The bullet-shaped fuselage, 128 feet long, seemed to lean forward—an impression created by the wings, which came out of the center of the fuselage near the belly and swept back at a thirty-five-degree angle on each side. The tips of the wings, 130 feet apart, had a slight melancholy droop. But the wings would straighten out during take-off, and their flexibility would act as shock absorbers against the "bumps" in the sky.

Below and just ahead of the forward edge of each wing hung two streamlined pods, each with a large, round mouth. Each encased a Pratt & Whitney J-57 turbojet engine. When the turbines in those four engines started spinning, great quantities of air would be sucked through the mouths of the pods and mixed with JP-4 jet fuel. The pressures that built up would develop a thrust of 10,000 pounds from each engine.

Two "tracks" of black metal, three and one-half feet apart, ran eighteen feet along the underside of the fuselage. This, Ed Hartz explained, was the director panel for the pilot of the plane receiving fuel. Each track had four message lights: up, down, forward, aft.

There are also five sets of progress lights, which enable the receiver pilot to fly his plane precisely between the director panels. When the receiver pilot can see both green lights, he knows he is in perfect refueling position. If he can see amber, he knows he is getting too low or too high, or too far aft or too far forward.

Beyond the amber lights at both ends of both tracks are red lights—for Danger. These warn the receiver pilot that if he does not correct his position immediately, contact will be broken. The "brains" of the refueling boom system—tiny automatic switches in the boom itself—will know that the limits of refueling safety have been violated. The switches will fire an electrical signal up the boom into an amplifier, and the boom will be instantly retracted.

"It is up to the receiver pilot," Hartz explained, "to keep his fuselage centered between the tracks. If he drifts more than fifteen degrees to the right or left, contact will be broken. It's the toughest kind of flying for bomber pilots, for they aren't used to holding such tight formation."

We climbed a short, steel ladder through a hatch and onto the flight deck of the KC-135.

"The instrument panel is less than half as complicated as the panel on a KC-97," copilot Tom Layne pointed out, "for there are hardly any moving parts in a jet engine to worry about."

Ed Hartz pointed to four switches and a single valve switch on the instrument panel. "Those four switches," he said, "start moving the fuel from our body tanks to the boom before contact is made. The valve switch controls the valve which pressures fuel through the boom into the receiver plane when connection is established." He motioned me into a seat directly behind his own. I strapped the safety belt around me, pulled on a heavy

(Continued on following page)

white crash helmet. An oxygen mask, attached to the helmet, gripped my chin and the bridge of my nose. It was like being locked up in a closet.

Hartz had the engines fired up and suddenly we were moving to the end of a 10,000-foot runway. He opened his throttles, revving up his engines. It sounded like a nearby waterfall. I could feel a tight envelope of tremendous power building around us. The big jet was poised, ready to go.

Now, Hartz's voice drawled in my earphones: "Boeing Tower this is Air Force *jet* one-one-two-oh. Request permission for immediate take-off." (The word *jet* wins take-off priority, for jet missions are delicately timed and jets burn expensive fuel in a hurry on the ground.)

"Jet one-one-two-oh cleared for take-off," the tower answered.

Hartz let go of his brakes and we were rolling, booming down the runway in front of twenty screaming tons of jet thrust. We straddled a yellow line in the middle of the runway for what seemed a long time. Then Hartz eased back on his control column and the earth fell away from us. It seemed as though a giant magnet were towing us into the sky. In six minutes we were at 30,000 feet, over Puget Sound.

I went back through the cavernous interior of the KC-135 with Hank Probst, Boeing's top boom operator. A few feet forward of the tail we climbed down through a hatch and stretched out on our stomachs on soft, leather-padded pallets. Our chins lay on sponge rubber rests, and we faced a window about four feet square. Probst handled some controls, and a portion of the fuselage beyond the window opened and slid upward into the upper half of the fuselage. Now, we had a clear view of the world.

"Depth perception and voice clarity are the main prerequisites for handling the boom," Probst said. "You must be able to tell exactly how far away the receiver plane is, because you are handling a steel boom that telescopes outward like a pile driver. If you hit him too hard with it you can damage the boom or the receiver receptacle. You've got to lay it in there gently.

"You've got to speak clearly so everyone will understand you the first time you say something," he continued. "You might not get a second chance to get a message across."

Fastening himself into shoulder harness and stirrups, Probst released the boom. It fell out behind us, a big, steel tail. Two small, black steel "wings" came out of a bulge in the end of the boom. These were the ruddervators, so called because they act as rudders and elevators in guiding the boom into the receptacle atop the fuselage of the receiver plane. Gripping the handle of the control stick below the right side of his pallet, Probst moved it up, and the boom rose until it was flying straight out behind us. He pushed down, and the boom went down. It moved, right and left, responding to his signals.

His left hand gripped another stick, below the left side of the pallet. He pushed this control stick forward, and the boom began telescoping out. Then he squeezed the trigger, and it shot back in.

Probst rolled off his pallet and motioned me to climb on. I slipped into the shoulder harness and stirrups, and began gyrating the boom, firing the telescope out, pulling it back in. The controls were feather-sensitive. This was not a job for heavy hands or slow reflexes. Impressed, I resumed my role of spectator.

On an electronic panel below the front edge of the pallet a blue light gleamed, indicating that we were ready to make refueling contact with the receiver plane. On one side of the blue light was a green light which would come on when the boom was in the receiver plane's receptacle. On the other side of the blue light, an amber light would flash on when contact was broken.

There were three dial faces on the panel. One showed the boom operator exactly where the receiver plane was within the fifteen-degree limits on either side of dead center. The second showed how far out the boom had telescoped, the third showed the elevation of the boom.

Besides actually "flying" the boom into the receiver plane, the boom operator must keep a sharp eye on this panel. He must always know exactly where the receiver plane is within the refueling envelope. If it gets too close, or too far away, or if any emergency develops, he must know exactly what the emergency is and always be ready to instantly hit his automatic disconnect switch.

Now we were at 33,000 feet, over the Pacific, west of Portland, Ore. Our speed was close to 600 miles an hour. Until now, refueling has always been done at about 250 miles an hour.

Ed Hartz informed Probst that the receiver plane was coming into position.

"Ready for contact," Probst replied.

"Receiver plane ready," Sandy McMurray said from somewhere.

Then I saw it. The huge B-52 dropped into sight behind our tail assembly. It was a frightening sight. Its wings swept back out of the top of the fuselage and spread out to a total width of 185 feet. The tail assembly was four stories high. The four double-sized jet pods, slung under the wings, made the plane look like a giant, evil bug.

(Continued on page 53)

For the first time the tanker plane is in the same league with the bomber it refuels. Able to fly more than 550 mph and at altitudes above 42,000 feet, the KC-135 can completely replenish a B-52's tanks in less than half an hour.

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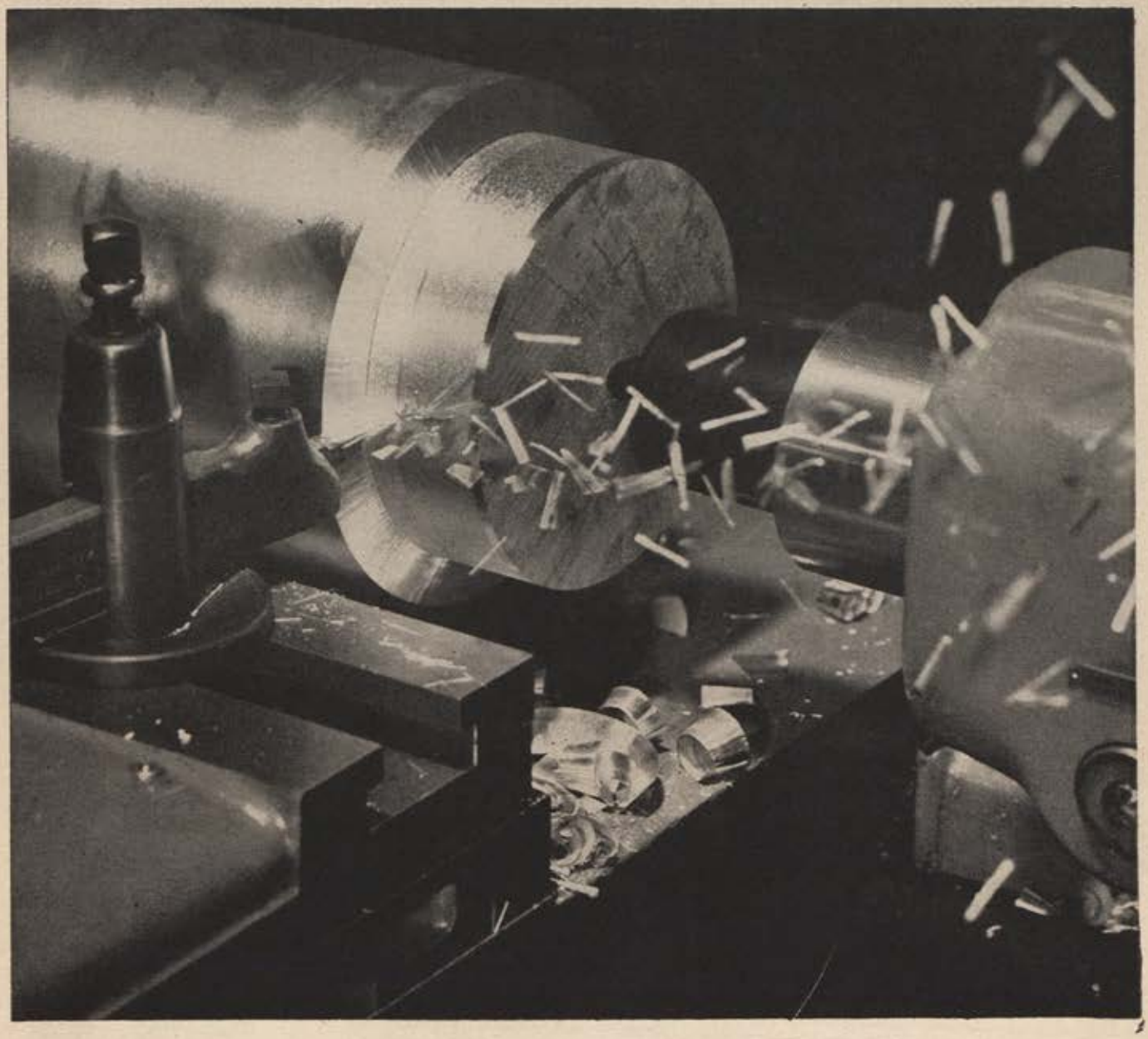

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It moved up behind us, closer, closer. . . .

"Forward fifty," Probst said calmly. He was telling McMurray to jockey in another fifty feet toward us. I have twenty-twenty vision. I thought we were certain to collide. But McMurray bore in on us, supremely confident in Probst's instructions.

"Forward forty," Probst continued. "To your right eight . . . forward thirty . . . to your right five. . . ."

Probst was working his control sticks now, and the end of the boom groped through the sky toward a shallow, V-shaped alley atop the fuselage of the B-52, directly over the flight deck.

Ed Hartz had to muscle the controls of the KC-135 because the nose of the enormous bomber below us created a wave of air that made our tail assembly want to lift. McMurray faced the same problem in reverse. He caught a downwash from the tanker and had to fight a tendency to nose over.

"Forward fifteen," Probst said. The telescope moved out of the boom, slowly, seemed to strain for the V-shaped alley. The giant bomber came in closer, seemed certain to crash into our mid-section.

"To your left three," Probst droned, "forward two."

The telescope of the boom was touching the front end of the alley now, wiggling slightly against the air rushing past it. Probst pushed forward on his telescope stick, and the end of the boom struck at the receptacle like a steel snake.

"Contact!" Probst said.

The receptacle mechanism fixed a steel grip on the end of the boom. It would not let go until the receiver pilot or the boom operator hit his disconnect switch.

It takes less than half an hour to completely replenish a B-52, but these were the longest minutes I ever lived. I could see Sandy McMurray's face plainly. He was not more than twelve yards from me. I watched his eyes move across the pilot-director panel on the belly of the tanker. He was much too close for comfort.

Rarely did the B-52 waver from dead center, and before it was inches away McMurray was bringing it back. Probst's face was lined with concentration, and his hands stayed constantly on the controls, sensing each slight movement of the mammoth airplanes. One instant his eyes were glued on the panel beneath him, where three needles hovered near the centers of the three dial faces. The next instant he was staring hard at the bomber behind him.

A KC-135 takes shape on the production line at Boeing's plant near Seattle.

The first production model of the Stratotanker is paced in a test flight over Seattle by a Boeing 707, prototype of the commercial version of the KC-135.

Suddenly, the B-52 started sliding beneath us. The boom moved straight down. The tail of the B-52 headed for our window like an office building on wheels! McMurray had picked up nearly twenty feet on us. Disaster seemed imminent.

"Back twenty," Probst said evenly. The bomber started to fall back in position. "Back fifteen," Probst said. "Back ten." Soon the bomber was again in perfect position.

It was beautiful, nerveless flying. If either Hartz or McMurray had become distracted for a single split second . . . but no one seemed to think of that but me.

"Receiver ready for disconnect," McMurray said finally.

"Tanker ready for disconnect," Probst answered. He hit his disconnect switch. A loud, metallic jolt shuddered through our compartment as the telescope jumped out of the receptacle and rammed up into the boom.

Probst wrestled with his hydraulic controls and soon had the boom stowed in the lower half of the fuselage again. The B-52 turned off behind us and drifted high out of sight. Minutes later, Ed Hartz set us down gently on Boeing Field.

It had all been strictly routine. Every three and one-half minutes somewhere in the world, a SAC bomber is refueled. And with jet-to-jet refueling now a reality, new lightning-quick muscle has been added to the Free World's biggest Sunday Punch—the Strategic Air Command. —END

ABOUT THE AUTHOR

Mr. Hubbell is a staff writer and associate editor of Flight Lines *Magazine, published by the Minneapolis-Honeywell Regulator Co. Born in New York City, he's a graduate of the University of Minnesota, where he majored in journalism. He served in the US Navy during and after World War II. An active freelance writer, his byline has appeared in* The Reader's Digest *and* The Saturday Evening Post. *His last article for* AIR FORCE *was in February 1956.*

WHEREAS, *efforts in behalf of peace and security require continuous reshaping of programs to meet changing conditions and avoid fixed and frozen ideas; and*

WHEREAS, *the pursuit of this policy by Col. William Mitchell in connection with the development of airpower as a potential weapon of national defense ultimately led to his court-martial and conviction; and*

WHEREAS, *subsequent events demonstrated the accuracy of Colonel Mitchell's theories as to the organization and utilization of airpower; and*

WHEREAS, *the adoption of these theories contributed greatly to the successful accomplishments in air warfare during World War II, and*

WHEREAS, *the Secretary of the Air Force, acting through a board composed of civilian officers of the Department of the Air Force, is authorized to correct military records in order to correct an error or remove an injustice; and*

WHEREAS, *in the light of the circumstances surrounding the conviction of Colonel Mitchell, and, more important, his great contribution to the defense of the United States, to leave this conviction standing on the military records of Colonel Mitchell constitutes a grave injustice to the memory of a great airman,*

Now, *Therefore, Be It Resolved:*

That the Air Force Association in the light of the foregoing take such steps as may be appropriate to have proper application made to the Air Force Board for the Correction of Military Records to void the court-martial proceedings, and to take further corrective action with respect to such records as may be considered appropriate.

THE CASE FOR BILLY MITCHELL

By Edmund F. Hogan
RESERVE AFFAIRS EDITOR

THIS resolution was approved by delegates to the Air Force Association's ninth annual Convention in San Francisco on August 13, 1955. The action called for by the resolution has been taken, and the Air Force Board for the Correction of Military Records has been asked to void the court-martial which convicted Billy Mitchell on December 18, 1925.

The case for Billy Mitchell was presented to the Air Force Board on March 15, 1956. On that date William Mitchell, Jr., son of the airpower prophet, and a Washington, D. C., lumber salesman, filed application to the board to "render null and void the proceedings, findings, and sentence of the general court-martial." At the time he filed his motion, the twenty-eight-year-old petitioner designated the Air Force Association to act as his counsel in the proceedings and concluded on this note:

"I sincerely believe that a gross injustice was done my father. History has vindicated him. I believe the United States Air Force cannot do less."

The Air Force Association, in support of the younger Mitchell's appeal, filed a 5,000-word brief spelling out the arguments for voiding the court-martial. Because the official transcript was not available at that time, the brief was compiled from such varied sources as Congressional hearings, Library of Congress records, newspaper accounts of the trial, and numerous writings by Mitchell himself and about him.

The immediate chain of events ultimately culminating in the court-martial charge had its origin in a press release issued by Mitchell on September 5, 1925. The statement was issued while Mitchell was serving as Air Officer of the Eighth Corps Area at Fort Sam Houston, Tex., and was prompted by two almost simultaneous aircraft disasters that shocked the world.

The more tragic of the two was the breaking-up of the Navy dirigible *Shenandoah* on September 2, 1925, over Ava, Ohio. In this accident fourteen crew members, including the commander, lost their lives. The other tragedy was an ill-fated attempt at a transpacific crossing by Navy aircraft in which the only airplane that could become airborne crashed.

Mitchell's statement of September 5, 1925, ran to approximately 7,500 words and was handed out to newsmen at Fort Sam Houston. In it, Mitchell made the following allegation:

"These accidents are the direct result of the incompetency, criminal negligence, and almost treasonable administration of the national defense by the Navy and War Departments. In their attempt to keep down the development of aviation into an independent department, separate from the Army and Navy and handled by aeronautical experts, and to maintain the existing systems, they have gone to the utmost lengths to carry their point. All aviation policies, schemes, and systems are dictated by the non-flying officers of the Army or Navy who know practically nothing about it."

This allegation set the court-martial machinery in motion. Mitchell was charged specifically with conducting himself "to the prejudice of good order and military discipline"; of being "insubordinate to the administration of the War Department"; and with "intent to discredit" both the War and Navy Departments.

Charges against Mitchell were investigated by Col. George A. Nugent, of the War Department's Inspector General Division, and on October 19, 1925, Nugent recommended Mitchell be tried by court-martial.

The trial began October 28, 1925, in an old warehouse near the Capitol building in Washington. Fifty-two days later, after approximately 1,400,000 words of testimony had been taken, Mitchell was convicted. He was sentenced to "be suspended from rank, command, and duty with forfeiture of all pay and allowances for five years." On January 25, 1926, President Calvin Coolidge approved the sentence with one modification. The President directed that Mitchell receive one-half of his monthly pay and his allowances—a total in those days of $397.67.

General Billy Mitchell—still a controversial figure.

Mitchell received his copy of the decision reached by President Coolidge at 6:15 p.m. on January 25. The following day, he resigned. Ten years later—on February 19, 1936—at the age of fifty-six, Mitchell died.

The Air Force Association brief took issue with the court-martial's finding that Mitchell was guilty of "intent to discredit" the War and Navy Departments. Proof of such intent, presumably a most important element of the accusation, seemed to those who prepared the brief to have been lost in the maze of proceedings and testimony.

Indeed, the Association argued, the intensity to which Mitchell held to his beliefs that the country's security depended upon the development of airpower and that the leaders of the War and Navy Departments needed to be aroused to its importance, offered ample testimony to the converse: that Mitchell's intention was not to discredit the departments but rather to keep the controlling groups in the services from bringing discredit upon their own services by stubborn indifference to the significance of this new weapon of warfare.

It is not generally understood that Mitchell discovered aviation after long experience as a ground soldier. He enlisted in the infantry in 1898, one day after the American declaration of war on Spain. He served eighteen years with great distinction in Cuba, the Philippines, Alaska, and on the Army General Staff before he ever flew an airplane. In 1912 he was the youngest major in the Army. He was a recognized expert on wire communications, and his reports on this subject have been converted into military textbooks.

Mitchell did not invent airpower. Other nations were far ahead of the United States in aviation when World War I broke out. In the period between 1908 and 1913, for example, US aviation expenditures were only $435,000 and the country had a total of twenty-eight aircraft on hand. Germany and France had spent more than $20 million each in the same period and each country had 400 aircraft on hand. Even such smaller countries as Bulgaria, Greece, and Japan had spent from $500,000 to $1,500,000, and each of these countries had four times as many aircraft on hand as the United States.

In 1916, Mitchell took up flying—at his own expense. He was sent to France considerably in advance of the American Expeditionary Forces and was attached to French aviation. When General Pershing arrived in France, he placed Mitchell in charge of American aviation at the front.

Mitchell won numerous decorations for his outstanding ability to organize and employ aircraft in battle. These were awarded, not for daredevil exploits, but for his contributions to military strategy and tactics.

When Mitchell returned from France in 1919, he was designated Assistant Chief of Military Aviation. He was then forty years old and had behind him twenty-one years of outstanding Army service. His experience and stature were of such proportions that he was appointed to a job carrying the rank of brigadier general.

The events leading up to the court-martial actually began after Mitchell's return from France. On September 30, 1919, by order of the Secretary of War, the Air Service was reduced from 10,000 pilots to 149. Six thousand of these were discharged in nine days. Aircraft production came to a virtual standstill, despite the fact that airpower had become a recognized element of warfare and despite the fact that other nations were turning to the air as the future primary medium of combat.

As early as 1920, Mitchell, the former ground soldier, began to raise his voice for airpower. In his search for the most effective ways to use airpower, Mitchell considered bombardment of surface vessels. He had his tiny air force engage in exercises that would demonstrate the effectiveness of airpower. When he was certain that the job could be done, he announced that aircraft could sink battleships by bombardment. The remark was taken to be an open declaration of war on the Navy.

But Mitchell persisted in his efforts and, in 1921, Congressional pressure became so strong that the tests were ordered. Captured German ships were used as targets, and Mitchell's bombers sent them to the bottom of the sea off Hampton Roads, Va., in conclusive proof of Mitchell's arguments that ships could be sunk by aerial attack.

In 1924, Mitchell received permission from his commanding officer, Maj. Gen. Mason Patrick, and from the President of the United States to publish a series of articles on airpower. In these he pressed his fight for recognition of the effectiveness of bombardment, for an Air University, and for a separate Department of Aeronautics. In 1925, Mitchell's appointment as Assistant Chief of Military Aviation expired and was not renewed. He was reduced to the rank of colonel and ordered to Fort Sam Houston. At the time, twenty-six Air Service officers called on him and told him that they intended to resign in protest. Mitchell forbade them to carry out this intention.

Officially, there is nothing to indicate the reason for Mitchell's transfer. There is a clue, however, in a statement made to a Congressional committee by Secretary of War Weeks. Weeks said that he grew "tired of the complaints from the Navy Department" and hauled Mitchell on the carpet.

Later, the Lampart Committee of Congress conducted an exhaustive inquiry into the air services. Mitchell was questioned on the subject of muzzling of military officers. He stated that despite announced policy to the contrary, officers were not permitted to give Congress their views without permission of the War Department.

Mitchell thereupon was transferred to Fort Sam Houston, and two pieces of legislation followed, which serve to prove that Mitchell had begun to interest Congress in his beliefs. The first provided that "no Army or Navy officer shall be transferred, demoted, or sent away" as a result of testimony

(Continued on following page)

he might give before Congress. Another bill called for the promotion of "William Mitchell by special act of Congress to the rank of major general."

In September 1925, President Coolidge convened the Morrow Board to investigate the air services. The resulting testimony fills six volumes. Pertinent to the Mitchell case is the comment of Acting Secretary of War Davis, who said:

"There has not been, is not now, and will not be any 'muzzling' of Army officers in the expression of their individual views."

During the hearing, Mitchell took these words at face value. He testified openly and frankly. Among other things, he testified that the Air Force consisted of about twelve outmoded pursuit planes and twenty-two worn-out bombers; that the United States had no more than 450 pilots.

In essence, Mitchell made the same charges before the Morrow Board that he did in the statement he released to the press, which led directly to his trial. Yet no effort was made by his superiors to discipline him for his Morrow Board testimony, nor to demonstrate that he was in error.

The beliefs which Mitchell expressed both before, during, and after his trial have been adopted. He sought the emergence of airpower as an instrument of national policy; development of military aviation in the US to the point where this country would lead the world in airpower; creation of a single Department of Defense, with a separate Air Force having equal status with the Army and Navy; and an Air Force academy for the training of air officers.

Today, it is difficult for most students of Mitchell to understand how he could have harbored the "intent" specified in the court-martial charges when the concepts he advocated have been adopted.

It would appear that Congress itself vindicated Mitchell as long ago as July 26, 1946, when it adopted a bill authorizing a special Congressional medal honoring Mitchell for his contributions to military aviation. The bill became law with the signature of President Harry S. Truman on August 8, 1946. The act stated that the medal was being awarded "in the name of the people of the United States, in recognition of his [Mitchell's] outstanding pioner service and foresight in the field of American military aviation."

From time to time, other bills have been introduced to honor Mitchell. None has been successful. One reason advanced several years ago was that enactment of legislation honoring Mitchell would be embarrassing to Gen. Douglas MacArthur, only surving member of the court which convicted Mitchell.

In 1945, Sen. Alexander Wiley of Wisconsin, long a Mitchell champion, wrote to General MacArthur and raised this issue. "I never heard that argument before," the Senator stated, "because it was my understanding that yours was the one vote against the court-martial verdict which cashiered Billy Mitchell."

MacArthur replied:

"Your recollection of my part in his trial is entirely correct. It was fully known to him, and he never ceased to express his gratitude for my attitude. It would have been ridiculous for anyone to say that any posthumous honors that might be granted him would be embarrassing to me. He was a rare genius in his profession and contributed much to aviation history."

The Air Force Association's case for Billy Mitchell culminated at 9:30 a.m. on May 14 in Room 5C883 at the Pentagon when three representatives of the Association and Billy Mitchell, Jr., appeared before the Board to make a verbal request that it recommend to the Secretary of the Air Force voiding of the court-martial.

The three representatives were Stephen F. Leo, a National Director of AFA; William R. Sweeney, member of the faculty at George Washington where Mitchell received his bachelor's degree in 1899; and this writer.

As counsel for the younger Mitchell, the AFA representatives questioned the nature of the sentence which would have made a military vegetable of Mitchell had he remained in service, and reaffirmed the belief that the court-martial is a blot, not only on the name of Mitchell, but on the country as a whole.

Mr. Leo concluded the presentation on this note:

"Regardless of the eminent position to which history has raised Billy Mitchell, the cold fact remains that there is a court-martial conviction against him.

"By declaring this conviction null and void, the Air Force does no more—nor any less—than provide Mitchell with the official recognition that is his just due."

As this report was written, the Air Force Board for Correction of Military Records was considering the application. The procedure established by law and policy requires that the Board's recommendation—for or against a reversal of the court-martial—be forwarded to the Secretary of the Air Force, who has full authority to make the final decision.

One of the least known boards in the Air Force is its Board for the Correction of Military Records. It has its origin in the Legislative Reorganization Act of 1946.

This law gives the Secretary of the Air Force, acting through a board composed of civilian officials of the Department of the Air Force, authority to correct any military record where in his judgment such action is necessary to right an error or remove an injustice. The broad authority conferred by this law has been recognized by ruling of the Attorney General, the Comptroller General, and the General Counsel of the Air Force.

The Board has been functioning since 1949. It has taken favorable action in more than 1,000 cases since that time.

Jurisdiction of the Board extends to all active and inactive members of the Air Force and to personnel who, at the time of their separation from the service or at the time of the court-martial sentence by which they were discharged from service, were members of the Aviation Section of the Signal Corps, Air Service, Air Corps, Army Air Force, or the US Air Force.

The Board, therefore, is competent to review the court-martial of Billy Mitchell.

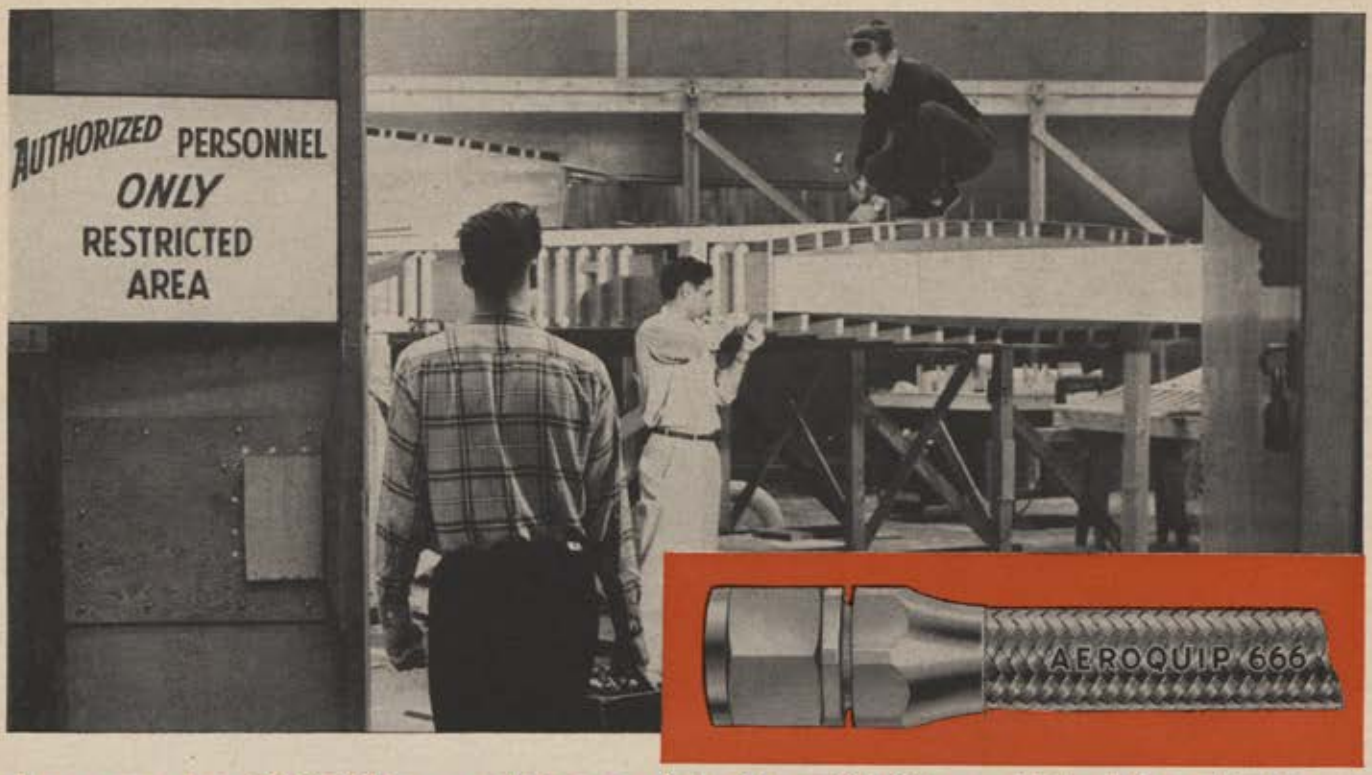
Board action is not final. The Board merely recommends action to the Secretary, who is the final authority.

If an application for the correction of a military record is rejected, the action usually is final. A new application can be made—but only based on new evidence.

A partial listing of the types of corrective action the Board can take might include:

Remove from the record of an individual reference to trial and conviction by court-martial; show discharged personnel restored to the active list; remove derogatory data from an individual's file; declare efficiency reports void; show an earlier date of appointment in the Reserve of the Air Force to remove a break in service.

Members of the Board are: George S. Robinson, chairman; John J. McLoughlin, Joseph F. Cunningham, Ralph P. Dunn, and Herbert R. Wildman. Frank D. Hardin is the executive secretary and Norman A. Compton the Board examiner.—END



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Because You Can Make The Assemblies You Want Quickly . . . By Hand

Simplify airframe, engine or accessory engineering mock-ups . . . reduce mock-up time. For high-performance fluid lines, use the *ONLY* hose lines made of Teflon that can be shortened or lengthened quickly and inexpensively . . . Aeroquip 666 Hose (Teflon) with ***"super gem"*** Fittings.

"super gem" Fittings are designed specifically for use with Aeroquip 666 Hose. They can be removed and re-attached in minutes, by hand, using bench tools. No swaging machine is needed. A small supply of Aeroquip 666 Hose and ***"super gem"*** Fittings allows you to make hose lines as you need them, or alter them when necessary. You never have to wait for shipments of factory-assembled lines.

Another Aeroquip advantage: ***"super gem"*** Fittings attach to Aeroquip 666 Hose by holding the outer wire braid, using the lip seal on the tube to hold the fluid. This means that the capacity of the fitting to hold the hose exceeds the strength of the hose itself. The ***"super gem"*** Fitting design remains perfectly leakproof for years, even successfully withstanding proof testing when inspected for fitness for further service . . . mail coupon for complete technical information.

HOSE LINES OF TEFLON can be made right in your plant. A wrench, a vise and a few minutes' time are all that are needed to assemble Aeroquip 666 Hose and ***"super gem"*** Fittings.

UNIQUE DESIGN of Aeroquip Leakproof ***"super gem"*** Fitting assures three functions: (1) grips and holds the external wire braid firmly; (2) seats the inner tube without compression thus forming a lip seal; (3) positive metal-to-metal line seal.

"super gem" is an Aeroquip Trademark

*Du Pont tradename for its Tetrafluoroethylene resin

Aeroquip Corporation,
Jackson, Michigan

Gentlemen:

Please send me your Bulletin AEB-13 on reusable ***"super gem"*** Fittings and 666 Hose.

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One basic tool of this "indispensable birdman," the Air Force navigator, is his sextant.

AIR FORCE CAREERS

NO. 9 OF A SERIES

NAVIGATORS—The Men Who ★ ★ ★ ★ See Bright Stars ★ ★ ★ ★

By Flint O. DuPre

THE navigator in one of today's high-speed, jet aircraft typifies the Air Force need to meet greater operational demands with fewer people.

Dramatic strides in aerodynamics and electronics have made it possible to compress more skills into individual aircrew members and reduce the number of people needed to man today's frighteningly powerful air weapon systems. For example, the navigator-bombardier on a Convair B-58 Hustler is one of only three crew members. On the eight-jet Boeing B-52 Stratofortress, he's one of a crew of five or six. On the now-obsolete Boeing B-29 Superfortress, he was a member of a twelve-man crew.

Today the navigator-bombardier is one of the two most important crew members who fly various types of Air Force planes, from bombers to fighters to transports, as well as those used for training, reconnaissance, air rescue, and all the other missions. He and the airplane commander, or pilot, are considered the "indispensable birdmen." Even other crewmen, like the electronics countermeasures expert on the B-52 or the radar-interceptor operator on a McDonnell F-101B Voodoo supersonic fighter, originally train as navigators.

The navigator-bombardier's career field AFSC is 1525—a magic number for a select and highly trained group of officers. There are currently about 20,000 navigator types in the worldwide Air Force, including observers who are rapidly being re-rated as navigators, out of a total inventory of about 73,000 rated people.

There are two ratings with appropriate wings for this career field—senior navigators and navigators. But those names don't tell the whole story,

(Continued on page 60)

"HOT STUFF" coming through...

A vital product need just ahead on the horizon, lies in the field of INFRARED*. For detection of any potential aggressor, Hot stuff* comes through! IR* has numerous significant advantages: target size is not critical...a passive seeker, it never divulges its source or location...will outperform radar of comparable dimensions. IR can't be jammed...when detecting, it can't be detected. LMEE...pioneering these advantages...has the research and production facilities to make all this a protective reality today. Its Advanced Electronics Center at Ithaca, New York, has an INFRARED Projects Group staffed by recognized authorities on IR development. INFRARED by LMEE...with its broad applications to Airborne Weapons Control Systems...is another LMEE contribution to new uses of Defense Electronics. For information on IR ...write Section A.

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Progress Is Our Most Important Product

GENERAL ELECTRIC

LIGHT MILITARY ELECTRONIC EQUIPMENT DEPARTMENT
FRENCH ROAD, UTICA, NEW YORK

In a classroom, an electronics instructor demonstrates use of oscilloscope.

AF navigator plots a course. The lives of his whole crew depend on his skill.

Advance trainee at Mather AFB uses Q-24 radar set for navigation and bombing.

since advanced training in the navigation field eventually qualifies many to be better known as navigator-bombardiers, with added duties as radar operator. Wearing his navigator hat, he directs the aircraft to and from its assigned mission. As bombardier, he operates bombing equipment over the target. And as a radar operator he handles the complicated radar bombing and navigation equipment.

The increasing importance of the navigator-bombardier imposes a complicated and costly technical training program on the Air Force. The pipeline must be kept full of young officers being trained in this career field before veterans like Maj. Albert F. Wooten, Maj. Gerald Rusch, Capt. Rene M. Woog, and Maj. Anthony P. Ozierski, among others, can guide B-52s nonstop around the world in a little more than forty-five hours.

The Air Training Command is responsible for turning these men out in large numbers. ATC's raw material includes aviation cadets, AF-ROTC graduates, non-rated AF officers, and rated officers with obsolete AFSCs, such as radar operators and observers. One day soon ATC will be getting many of its trainees from the Air Force Academy. Maj. Gen. James E. Briggs, Academy Superintendent, recently said that the Academy will produce about half of all AF Regular officers when the Cadet Wing reaches full strength in the early 1960s. Significantly, General Briggs added that training in navigation is the backbone of the Academy's airmanship training.

ATC now trains primary-basic navigators at Ellington and Harlingen Air Force Bases, both in Texas. Advanced training for electronic countermeasures is at Keesler AFB, Miss.; radar intercept is taught at James Connally AFB, Tex.; and navigator-bombardier training and the upgrading of observers is conducted at Mather AFB, Calif. The end product of all this training, which runs into months, is the skilled navigator-bombardier (AFSC 1525), the electronic countermeasure officer (3021), and radar-intercept officer (1561).

The courses at Mather are conducted at the most advanced levels in preparing individuals for crew duty in the newest strategic and tactical bombardment and reconnaissance aircraft, including the B-52, B-47, B-57, and B-66. For training purposes Mather uses a fleet of T-29 Convair aircraft, each of which can accommodate seven navigation students. Each trainee has at his desk the basic equipment

(Continued on page 63)

THE BIG STICK

Since 1946, Martin engineering has placed special emphasis on the science of rocket and missile development.

It is because of this that Martin is now building a most potent and important weapon system—the ICBM Titan—an ocean-spanning missile to back up the traditional American policy of peace with honor: *"Speak softly and carry a big stick!"*

From this intercontinental peace protector to the world's first satellite launching vehicle now nearing completion, Martin engineering is pioneering the new age of missiles and rockets.

If you are on the watch for tomorrow, watch Martin today.

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What airline is giving all its planes radar "eyes"?

United Air Lines

First U. S. airline to order radar for all its planes, United now has the world's largest radar fleet—and more coming. Radar lets your pilot "see" through cloudy skies 150 miles ahead, helps him pick the best and smoothest course. You experience new comfort and even greater on-time dependability at any time of year when you fly United. For reservations, call or write United Air Lines or an Authorized Travel Agent.

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®

Student navigator aboard T-29 trainer.

Ellington, Harlingen, and Mather AFBs use Convair T-29 "Flying Classrooms."

of his trade—a compass, an altimeter, an airspeed meter, and a radio compass. Each has the use of a radar altimeter. This makes it possible for each student to participate in the usual navigation missions outlined in the course, as well as dead reckoning, celestial, radio, and polar navigation. Several men may be working on entirely different navigation assignments as their T-29 "Flying Classrooms" speed over the California countryside. Such training has gone on at Mather since 1947, and among its graduates are the Air Force's most experienced navigator-bombardiers. Ellington and Harlingen AFBs use the T-29 in their training programs.

Another training device used at Mather is a huge twenty-two-ton hollow globe of tubular steel in which tiny lights duplicate the position of the stars. Developed for the Air Force by Link Aviation, Inc. (builder of the famous Link Trainer for pilot instrument flight training), it is called a D-2 high-speed, celestial navigation trainer and looks like something straight from Buck Rogers. A massive concrete building houses the trainer.

From a platform inside the globe the student navigators make simulated flights anywhere in the Northern hemisphere. In the darkened inside the student can star-gaze at the heavens over North America, Russia, and the rest of Europe and parts of North Africa. He may make a training flight along a star route from the tip of Baja California, across the North Pole to Bengal, India, nearly 8,000 miles away. Or he may position himself in space 100,000 feet above the North Pole, race along at 1,725 miles an hour, and with his sextant take a line of position and heading check on the North Star millions of light years away. He plots it on a map and comes up with a ground position accurate to within one and a half miles.

Student officer uses a B-3 drift-meter to obtain drift and ground speed information during a navigational training flight in a T-29.

When the trainee receives his wings, such objects as his maps, dividers, and oxygen mask will be old friends.

What exactly is navigation? There's the land variety. Marco Polo did some navigation on foot worth recalling when he successfully made his way from Italy to China. Or, on the sea, Christopher Columbus and Ferdinand Magellan plotted courses that earned them everlasting fame. And in the air, among the earliest flights there were distinguished feats of navigation—as well as airmanship. Charles Lindbergh's pace-setting flight across the Atlantic Ocean thirty years ago was navigation at its best, considering his equipment. For such a flight, his navigation guided him to both his destination and a date with destiny.

An airman's definition of air navigation: The art of determining the position of an aircraft at any time and directing the aircraft from one position to another.

But air navigation begins and ends on the ground. Before a flight the navigator must determine an initial heading, which will give him a desired course to his destination. Once in the air he must solve the major problems of navigation, such as time to destination, position, direction, and distance. The position, direction, and distance on the surface of the earth—in relationship to the aircraft aloft—are the substance of aerial navigation. Above all he must be quick in solving problems. His life, and those of his crew members, depend on the exactness of his science and judgment.

Members of this career field have a proud heritage both in war and in peace. Two navigators, Lts. Robert E. Femoyer and Walter E. Truemper, earned the Congressional Medal of Honor for heroic actions during WW II.

Today the highly skilled navigator-bombardier in the Air Force has basic knowledge of nuclear weapons and is trained for assignments in these weapons. He is that peculiar breed of jet-age crewman who depends more and more on electronics as well as his own multiplying skills.

Or, if you wish, he is a highly specialized star-gazer with eyes turned toward the ever-shrinking heavens.—END

ALLISON POWERS

—LOCKHEED T-33
AND T2V SEASTAR

Nine out of ten jet pilots earn their wings with Allison J33 engines.

The J33 powered America's first production jet fighter—the F-80.

Through 12 years of continuous production, the J33 has established a reliability record second to none. In fact, the J33 is the *only* jet engine on a 2000-hour overhaul schedule.

Jet age experience is a matter of record at Allison—America's pioneer producer of turbine aircraft engines.

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ALLISON *Prop-Jets and Turbo-Jets*

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LET'S HAVE YOUR JET BLAST

In "Jet Blasts" you can sound off on any subject you want. We'll pay a minimum of $10 for each "Jet Blast" used. All letters must be signed but we'll withhold names on request. Keep letters under 500 words. "Jet Blasts" from service personnel do not necessarily report official policy.

Are We Being Penny-Wise and Pound-Foolish?

AFA's concern with our over-all national defense strength and the probability of a 110-wing Air Force are points well taken.

From my position as an instructor-pilot in a Contract Primary School, I wonder if your prediction is not a little too optimistic? If the present trend continues, we shall have a 100- or a ninety-wing Air Force in the near future.

This opinion is based on the continual cutback in the student load at the primary schools. A few years ago the accepted need was 7,000 student pilots a year. For the fiscal year of 1958, it is a little over 3,500. It is difficult to associate this low figure with an Air Force of 110 wings. If the past few years had shown a marked increase in the number of pilots choosing the service as a career, perhaps that cutback would be justified; but we have seen no such trend. In fact, with ROTC students comprising the majority of the present student load, one finds fewer students who honestly intend to stay in the Air Force. A recent article published in a national magazine stated that seventy percent of today's pilots are leaving the Air Force. The outcome can only be a much smaller and much less effective Air Force.

Now, supposedly in the interests of economy, it is recommended that this school be disbanded because the primary contract program is presently operating at approximately sixty-five percent of capacity. Can national defense *really* afford this cutback? Let us first consider the present need of national defense as indicated by our foreign relations. Our national defense needs are dictated to us by the actions and capabilities of foreign countries. Russia's present capabilities and indicated intentions, particularly in the Middle East, *should* preclude reducing our defenses at this time. Should Russia be able to extend her influence in that area to the extent of gaining control of the rich oil fields, Western Europe can be brought to terms without the firing of a shot.

Western Europe, our most important ally, depends upon the Middle East oil for its economic and military strength. We have spent billions of dollars helping these allies and building a defense organization capable of containing Russia. It is inconceivable that our foreign policy will allow the loss of this all-important oil to our most important allies; for if this should happen, Western Europe would become a liability and then we truly would have to "go it alone." But with *what*?

Our aircraft procurement program has been cut back; we are now in the process of drastically cutting back the pilot training program. Will that missile program be ready in '58, or '59, or '60? And if it is, could we morally use that program? For such missiles would have to be armed with atomic and nuclear warheads.

If it is wise to spend $200 million this year in the Middle East (and the President and the Secretary of State assure us that it is) and to spend $4 billion for other forms of foreign aid, it would seem that the continued expenditure of $6 or $7 million per year, the cost of this base, would be even more expedient. For this minor expenditure, a fractional percentage of the other sums mentioned, we are producing Air Force pilots, a very tangible form of security. It would seem economic to pay $6 or $7 million for qualified policemen—and our Air Force pilots could be termed international policemen—rather than to pay out $200 million or more as inducements or bribes to prevent attack.

Another question is this: If economy is the paramount issue, is it true economy to disband one of the most efficient units in the defense program? The Primary Contract Schools have provided the Air Force with a better product at a lower cost than the planners of that program had hoped for. The contractor has been able to do this because the personnel at these bases possess a wealth of experience. For example, the experience level of the average instructor-pilot at this base is approximately 5,000 hours of flying time and compares favorably with that of a senior Air Force officer. His cost to national defense is less than the officer, because the contractor has only the salary to pay. He doesn't provide the man with housing, complete medical care for himself and family, and retirement after twenty years. Neither did the contractor or the Air Force have to reinvest large sums in his training, for he possessed the experience and the background necessary for his position before employment. Most of this valuable experience was acquired during previous military service. About eighty-five percent of the instructor pilots flew for one of the services.

The same level of experience and background applies to aircraft maintenance and many other fields. If this base is disbanded, the Air Force and national defense will lose the services of such people for they will quickly find employment in other businesses. Once these experienced men have changed to other fields it would be difficult or impossible to recruit them again should the national defense need become acute.

Another point to consider is that with the implementation of a jet trainer into the primary program, an anticipated action in 1958, the Primary Schools will once again require as many instructors, maintenance personnel, and others as they are now employing. Wouldn't it be wiser to continue, at sixty-five percent of capacity, and have room for rapid expansion should the defense need arise? Instead of curtailing the use of civilian contractors, the Air Training Command could well investigate the possibility of extended operations, thus releasing needed personnel for combat wings and accomplishing the same training mission at a lower cost.

(Continued on following page)

Considering the sums involved and the contributions made to national defense by such sums, the disbanding of a unit, which has already proved to be efficient, because it is not operating at one hundred percent capacity would seem penny-wise and pound-foolish.

—WILTON B. HODGES

Though no stranger to our readers, Mr. Hodges's byline hasn't appeared in our pages for some time (Jet Blasts," September 1953 and April 1954). A veteran of four years in the Air Force during World War II, with a total of 5,500 instructor hours, he was a flight instructor at Randolph Field in 1942 and later a flight commander in the 310th Ferrying Squadron in Europe. After the war he operated a flight school in Missouri, training students under the GI Bill. For the past two years Mr. Hodges has been an instructor-pilot at a Contract Primary School in Kinston, N. C. He'll soon move to Spence AB, Ga., as instructor. He's thirty-seven, married, has three sons.

Formula for Achieving Victory Through Her-Power

The other night while my husband washed the dishes, put the children to bed, and finished hemming some tea towels, I read an article about discipline. Now, discipline is a fine thing in the proper hands, and we wives enjoy using it very much. Some of us have achieved good results in the matter of husband training.

Military discipline is fine, too, but really *effective* discipline starts in the home. The well-indoctrinated wife manages the career, providing the discipline which is the basis of security. Since Air Force husbands have their feet firmly planted in mid-air, the Air Force wife must provide the discipline for the family. And when the family has to move out of the country, this discipline should carry over.

Making a home in a foreign country is exactly the same as establishing one in the States. It's simple if you have a husband who always submits to your superior judgment—and also if you have plenty of money. However, I would like to point out a few shortcuts which will make your overseas tour memorable for you—and one which your husband will never forget, either.

After your husband reaches your new station, you will get a letter saying you won't be able to join him for an indefinite period. You can depend on this. A housing shortage *always* exists *wherever* a husband goes. But don't wait for your husband to straighten things out; take things into your own hands. Write a snappy note to his commanding officer. Explain that a house must be found *at once*, since your husband never does anything right unless you are with him. This is most important. No commander wants his personnel just muddling around. My last letter achieved good results. The adjutant replied that my husband would be taken care of. And as soon as possible.

While they are taking care of your husband, don't relax. Ask your Congressman to investigate the housing shortage. A little publicity can have a startling effect on military careers, so tell your Congressman to ask that the Inspector General call your husband in to get the *real facts*. Don't make my mistake, however, and write to two Congressmen. Professional jealousy caused each to cancel out the other's efforts. Nothing was done to help me either in the House or in the Senate.

During the waiting period, be sure to send all your husband's golf clubs, hunting equipment, fishing gear, etc., to permanent stateside storage—*not* to the overseas station, no matter how many pleading letters you may get. After all, it creates a very bad impression if the Boss asks your husband to play eighteen holes with him on a Saturday afternoon, and your husband says yes. Anybody who has sporting equipment obviously doesn't spend all his time at home working on projects he has brought from the office.

Upon reaching your new station, don't let your husband settle for an apartment. Rent a villa and hire several servants. Don't be satisfied with just "getting along" in temporary quarters. It may prove expensive, but the wife who is truly a disciplinarian can economize in other ways. John is now so lean that we will save enough to buy a new mink stole by his wearing those old uniforms for a few more years. Such an affluent pose on the part of Americans in a foreign nation also helps public relations with indigenous personnel, who are usually less well-heeled than we. They may not understand us, but invariably they will cultivate our attitude and covet our possessions.

Your husband will probably be transferred in the middle of your tour. My husband is transferred quite often. When this happens, don't give up that villa—make him commute! Military men need homes to which they can retreat after five o'clock, close enough to the city to take in the movies, dances, and other formal social activities. My husband commutes seventy-five miles every day, and shows his appreciation by not even going out with the boys any more. In fact, he usually goes to bed quite early. In this way, I always know precisely where he is; except, of course, for those nights when the poor man has to work late at the office.

One more tip. Be sure the commanding officer knows *exactly* what is wrong with his command. I know our General appreciates this. He always leaves parties after I have talked with him, no doubt to institute immediate corrective action.

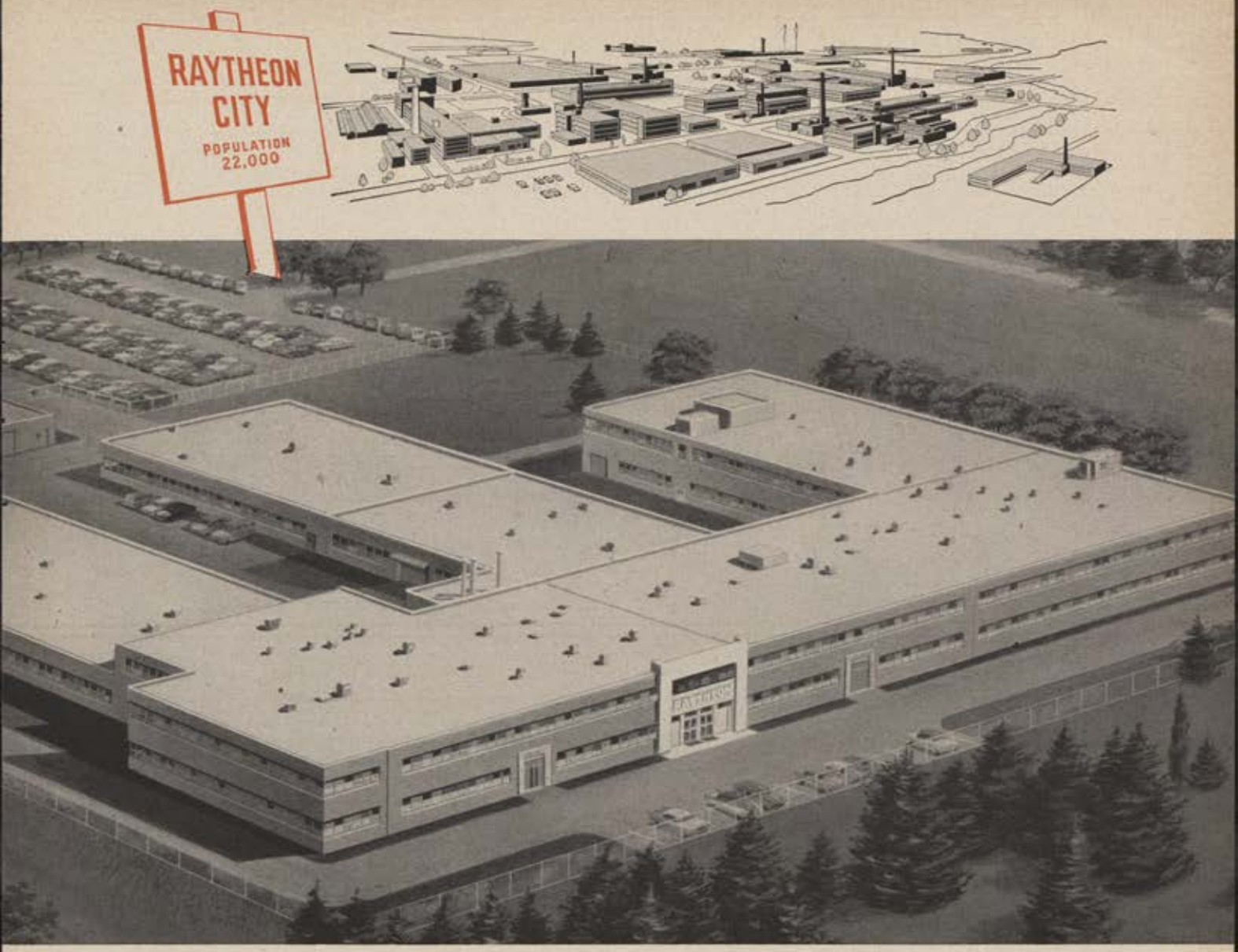
If you follow my advice, soon your husband will be relying more and more on your judgment, as mine does. Just recently John told me he would soon be out of the Air Force if I continued to manage his career!

If any of you would like to have future guidance, don't write me here, as I have worked very hard on our transfer. Address me at Getulcers Air Force Base, Tripunting, The Azolles.

Let me leave this message. If this has shown you something, the memory of your overseas tour will undoubtedly follow your husband forever.

—MRS. LIEUTENANT COLONEL MUDD

Our Mrs. Mudd is, in real life, Mrs. Jay Conway. She became a "camp follower" when her husband was inducted into the Army. The next five years were spent following him around the US. In 1948 they went to Tokyo where she was picked up as a Russian spy. (After a shopping trip she got lost trying to find a friend's house, which she knew was near the Russian Embassy. She asked directions to the Embassy from the first American she saw—who happened to be a CIC agent. He took one look at the soap, sugar, cigarettes —all highly valuable black-market items—and assumed she was trading with the Russians.) Her husband is now assigned to SAC Headquarters at Offutt AFB, where they live with their two sons and a much-loved Weimaraner dog.



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Ultra-modern Wayland Engineering Laboratory is an important new landmark in the development of Raytheon "City"—a rapidly growing community of electronic centers extending from Massachusetts to California. Here are the vital statistics:

POPULATION: 2,000 scientists and engineers; 22,000 skilled men and women in all.

BUILDINGS: 21 plants and laboratories.

WORK AREA: 861,000 square feet of engineering space; a total of 4,062,827.

ACTIVITIES VITAL TO NATIONAL DEFENSE: Missiles—Navy Sparrow III and Army Hawk; Radar for the Air Force's B-58 and B-52; DEW line radar; tubes, transistors, counter-measures.

REPUTATION: World-wide.

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Waltham 54, Massachusetts

UNITED STATES AIR FORCE'S

Golden Anniversary Celebration

REALLY GETS OFF THE GROUND

At Chicago's Golden Anniversary Luncheon, Mayor Richard J. Daley introduces Air Force Secretary James H. Douglas to an overflow crowd of 1,600 at the Conrad Hilton Hotel.

Luncheon speakers, Mr. Douglas and Gen. Thomas D. White, discuss the Golden Anniversary program with AFA President John P. Henebry, who was general chairman for the event.

A PREDICTION made by AFA President John P. Henebry shortly after his election in New Orleans last year came true on May 23 in Chicago. As General Chairman of one of the largest and most successful programs ever sponsored by an AFA organization, Mr. Henebry more than fulfilled his pledge to "present a program in Chicago that will put AFA on the map."

Co-sponsored by the Illinois Wing of AFA and the Chicago Association of Commerce and Industry, the program was designed to pay tribute to the USAF on its Golden Anniversary and to recognize the contributions which the state of Illinois has made in the development of the Air Force.

Operating on an exact timetable to accommodate its many events, the program was launched in the morning with a Jet Age Symposium that played to a capacity audience of more than 1,200. Alex Dreier, well known NBC news analyst, was moderator for the symposium. A panel of three experts—Lt. Gen. Joseph H. Atkinson, Commander of the Air Defense Command; Maj. Gen. David H. Baker, Director of Procurement and Production, Air Materiel Command; and Daniel E. Noble, Executive Vice President of Motorola, Inc.—each spoke for twenty minutes on various airpower developments.

Immediately following the Jet Age discussion, a USAF Golden Anniversary Luncheon was held. Once again the crowd reached overflow proportions as 1,600 airpower advocates taxed the huge Conrad Hilton Grand Ballroom. Air Force Secretary Donald H. Douglas and next AF Chief of Staff Gen. Thomas D. White—both natives of Illinois—were the principal speakers.

Meanwhile, in other parts of the country, Golden Anniversary celebrations were going on, too. For example, in Atlanta, Ga., Air Reservists captured the spotlight during Armed Forces Week with a huge float dedicated to the Fiftieth Anniversary. The float took part in three major parades, including the assembly down historic Peachtree Street before 200,000 spectators. At a banquet attended by Air Force, Air Reserve, and civic leaders, Brig. Gen. Homer Flynn, Georgia's Assistant Adjutant General for Air Affairs, presented a special plaque from AFA to Maj. Clifford H. Baldowski, commander of the local ISO flight. The plaque, awarded for the flight's contributions to Air Force and Air Reserve programs, was accompanied by a telegram of congratulation from AFA President Henebry.

And out in the Pacific Northwest, May 27—June 1 was declared "Golden Anniversary of the Air Force Week" in Spokane, Wash. The hard-working Spokane AFA Squadron came through with another sparkling community effort when its members sponsored a Golden Anniversary Luncheon at the Hotel Ridpath. Dr. John F. Victory, NACA Executive Secretary, was principal speaker. AFA awards went to Brig. Gen. Hillford R. Wallace, USAF (Ret.), and to *The Spokesman-Review* and the Spokane *Daily Chronicle*. The Prudential Life Insurance Company, which sponsored the CBS televised "Airpower" series, was also honored by AFA at the luncheon.

The final day of the week-long anniversary celebration featured an open-house at Geiger AFB. The USAF Thunderbirds jet acrobatic team headlined the day's activities, which included many ground displays.

Even torrential rains that have plagued the Oklahoma area failed to dampen an enthusiastic Golden Anniversary Day in Tulsa on June 1. A luncheon at the Municipal

The success of their Illinois Golden Anniversary program brings happy smiles to Wing Treasurer Harold Garson, Mr. Henebry, Daniel E. Noble, Lt. Gen. Joseph H. Atkinson, Maj. Gen. David H. Baker, and Bob Vaughan, past Wing Cmdr.

Left, "Miss Georgia Air Reserve," Carolyn Reeves, adorns Golden Anniversary float which was the star attraction at three major parades during Armed Forces Week in Georgia.

Airport honored local pioneers and Maj. Robinson Risner, who had just duplicated Lindbergh's famous transatlantic flight (*see "Airpower in the News"*). A native of Tulsa, the Korean jet ace flew to Tulsa in a North American F-100 and carried messages from Secretary Douglas and General Twining to the Mayor of Tulsa. Although the steady downpour caused a scheduled air show to be canceled, thousands braved the rains to see the Golden Anniversary ground exhibits at the Municipal Airport.

Many other Golden Anniversary events in all parts of the country are planned between now and the official Air Force birthday on August 1, around which AFA's 1957 National Convention is planned. Unquestionably, this year's Convention will be the largest and best attended in AFA history. It is interesting to compare the 1957 Golden Anniversary Convention with the 1953 meeting, the last AFA Convention to be held in the nation's capital.

By any standards the '53 Convention was a great success. In fact, it was later described as "the finest Convention AFA has staged to date." Its many attractions, dinners, luncheons, reunions, and business meetings certainly uphold that statement. But in 1953, a total of 840 persons attended the four-day Convention. This year, two months before the Convention began, a record-smashing 2,247 room reservations had already been received. The previous all-time high for *any* AFA Convention was the 2,100 attendance in New Orleans last year. Although AFA has set aside 3,000 rooms and 350 suites in twelve of Washington's leading hotels, it would be a gamble to delay any longer in making your registration. From all indications, some 3,000 delegates, participants, and guests will converge on the nation's capital for AFA's eleventh and greatest national Convention.

Your advance registration and room reservation does more than insure an air-conditioned room. It gives you first consideration for seating at dinners and other functions. Advance registration also eliminates long lines at registration desks and permits a choice of the Anniversary Balls on August 1. Each ball will be dedicated to a wartime theater of operations: the Asiatic-Pacific, the European-African-Middle East, or the American Theater.

So . . . if you were part of Gen. George Kenney's air war in the Pacific and don't relish the idea of reliving the problems of Eighth Air Force's daylight bombing or pondering the perils of the Pentagon, send along that handy registration form on page 25 of this issue. Even if you're not quite sure you can make it this year, send it along anyhow. You'll be able to cancel out any time until July 27 and have your money refunded.

Although the actual Convention events get under way on July 31, there will be three big days of pre-convention activities beginning Sunday, July 28, with a Golden Anniversary air show at Andrews AFB. The annual AFA Ricks Memorial Jet Flight will terminate at the Washington air base after a flight from Fresno, Calif. The famous Bendix Trophy Race has been added to an already star-studded program. Another highlight of pre-convention activities will be the annual Reserve Forces Day on Tuesday, July 30. Included are a Reserve Forces Seminar, the Reserve Forces Reception, and Reserve Forces Banquet.

Industry day is the last of the pre-convention events and will take place at the Sheraton-Park Hotel on Wednesday, July 31. The events include an AMC briefing for AFA Industrial Associates, a USAF-Industry Luncheon, and a briefing by ARDC key personnel. Concurrently with these activities, there will be two AFA business sessions and, that night, the Airpower Panorama Preview and Champagne Reception will take place at the National Guard Armory.

At that other Washington Convention, in 1953, there was no Airpower Panorama. AFA's entry into the aircraft exhibit world came during the 1955 Convention at San Francisco. It started in a big way and is still growing. This year's Panorama, the largest aviation exhibit in the country, will be twice as large as the mammoth display in New Orleans, which last year drew 83,000 viewers to the Municipal Auditorium. This year the public will be admitted free of charge to the Washington National Guard Armory to see the Panorama, which will include 76,000 square feet of Air Force and industry exhibits, valued in the millions of dollars. Special buses will run between the hotels and the Armory to transport delegates and guests.

Thursday, August 1, is the big day—the Fiftieth Anniversary of the United States Air Force. Special events in Washington during the Convention will coincide with a long list of Golden Anniversary events taking place across the country and throughout the global Air Force. The AFA Convention schedule has been extended one full day so that all of the activity on August 1 may be devoted to Golden Anniversary events. A glimpse at the complete list of Convention events on pages 24 and 25 of this issue will give you an idea why this year's AFA Convention will be the greatest of the great and certainly one you shouldn't miss. See you in Washington!

—William O. Costello

An airplane receives a detergent bath during normal decontamination process at San Antonio Air Materiel Area.

A brisk scrubbing after bath captures particles escaping the detergent wash.

COLD Baths for

By Maj. Gen. Thetus C. Odom
COMMANDER, SAN ANTONIO AMA, AMC

RADIATION can be dangerous. So can a cigarette. Put the wrong end of a cigarette in your mouth and you get burned. Handle radioactively contaminated articles as carelessly as that and you get burned, too. But if certain precautions are taken, handling radioactive materials need be no more dangerous than smoking a cigarette, and certainly not as dangerous as driving your car on a well traveled highway. But you don't sell your car and quit driving because there are a few maniacs on the highways. Despite all of its problems, atomic power can be an instrument for good as well as evil, just like the car, as soon as it reaches the same stage of public acceptance.

The problem of public education in radiation and decontamination is of great importance at present. Lack of it can cause serious work stoppages in industries where fissionable materials are used.

Not long ago, in Texas, an employee of a firm that had a contract with the San Antonio Air Materiel Area took an empty wooden box home from work with him and made a doghouse out of it. A few weeks later, the dog died. More than six months later, the man removed the box from his yard. When he turned it over, he noticed a warning painted on the bottom that the box had contained radioactive material. Much excitement ensued. Local health authorities told the man the radioactivity could possibly have been a contributing factor in the death of the dog. The man then threatened to sue the contractor.

The contractor could have paid the claim for the value of the dog with less expense than he could have fought a suit. But there was more involved. Suppose the claim had been settled. This could have amounted to an admission of liability on the part

Above, a routine practice—after decontamination activities, all employees run through a Geiger-counter check to guard against exposure to radioactivity.

Prominently displayed signs (left) are mute reminders to decontamination personnel of the care they must exercise before entering the dangerous area.

'HOT' Aircraft

Here's the story of a new hazard facing the men of today's Air Force—decontaminating radioactive planes . . .

of the contractor. Then any person in the man's family who later became ill of any one of numerous diseases might think exposure to the supposedly radioactive box had caused the illness. Or a neighborhood child who developed a speech impediment or a limp or a disease might make a claim for damages against the contractor on the grounds that the child had at some time been in the yard and, therefore, exposed to the box.

Unless it was firmly established that the box and the death of the dog were completely unrelated, the contractor might have faced a rash of damage suits.

At a much heavier expense than the cost of a dog, the contractor used the most sensitive instruments and showed conclusively that the box could not have been responsible for the dog's death.

This points out the general fear in the minds of a public that has not been sufficiently educated about radiation. This fear was built in their minds with the two awesome blasts and the resultant death toll at Hiroshima and Nagasaki. Actually, eighty-five percent of all casualties in those two cities would have occurred with a conventional bomb of the same power. Only fifteen percent of the casualties can be attributed to radiation.

Of course, it is true that concentrated doses of radiation can cause severe casualties. But it is equally true that extremely mild doses will have no ill effect on the human body. Scientists have determined and defined these levels, insofar as the actual detonation of a nuclear or thermonuclear weapon is concerned. But what of the contamination which necessarily results to the aircraft that delivers the weapon, or of other aircraft that fly through the atomic cloud?

At the San Antonio Air Materiel Area, we have been given prime responsibility for setting up standards and procedures in the decontamination of weapon systems and their component parts. Working with information gained from many other units in the Air Force, we are trying to determine just how quickly and effectively contaminated aircraft can be reduced to radiation levels that permit maintenance and operations without any hazard to ground or flight crews.

The problem of determining a "safe" level is perhaps the greatest one we face at the moment. No marriage of the minds of industry and government appears imminent on this point. It is well known that the human body is constantly being bombarded with radioactive particles from minerals in the earth, from cosmic rays and from many other sources.

(Continued on page 74)


SUNDSTRAND
First in Constant Speed Drives
53118
U.S. AIR FO

SUNDSTRAND DRIVES

insure peak efficiency for 400-cycle electrical system on KC-135 Stratotankers

The Air Force's new jet transport tanker, the Boeing KC-135, matches the performance of jet combat aircraft to provide faster, more efficient refueling. This, in turn, extends the potential striking range of both fighter and bomber aircraft. The Stratotanker's 400-cycle, automatic, paralleled electrical system is driven directly from the engines by Sundstrand Constant Speed Drives. Reliability inherent in the custom-design of the Sundstrand Drive insures peak performance for the KC-135 in carrying out its vital mission. Its light weight helps provide maximum flight capability. Application of Sundstrand Drives to provide the Stratotanker with a high-capacity, stable electrical system results from the record for reliability that makes Sundstrand *first* in constant speed drives.

ONE OF MANY MODELS

The "Package-Type" drive shown at right is slung from the underside of the KC-135's engines and is shaft-driven from the waist gearbox. More than 20 different models of Sundstrand Drives have been installed in virtually every major type of aircraft.

SUNDSTRAND AVIATION

Division of Sundstrand Machine Tool Company · ROCKFORD, ILLINOIS

Sundstrand Aviation-Denver: Denver, Colorado · Western District Office: Hawthorne, California

CONSTANT SPEED DRIVES · AIRCRAFT ACCESSORIES

However, this radiation and a great deal more can be accepted by the body without harm. In order to protect our personnel as much as possible, we have established that certain limits can be tolerated safely.

Aircraft which have been radioactively contaminated above these limits must be handled in a manner whereby personnel are not directly exposed to any of the highly contaminated parts. All work performed on the plane is monitored by qualified personnel and closely supervised by medical personnel with a health physicist capability, since a potential health problem exists. All of the personnel involved wear X-ray film badges providing a permanent record of gamma rays to which the body has been exposed. For immediate determination of the amount of radiation present, portable radiological survey meters are used. These battery-operated instruments are carried by the monitors. An indicating meter gives visible indication of the amount of radiation present, and earphones give an audible count.

Monitors determine the amount of radiation present and the length of time that an individual can work on the project without exceeding the permissible limit of radiation. They make sure that all working personnel are practicing good health habits and are not exceeding exposure limits. The monitors are also responsible for the proper marking and tagging of contaminated parts and equipment. Monitoring tags show the amount of contamination and the date of monitoring.

The actual decontamination is no more involved than taking a bath. Any good detergent will decontaminate. Since the radioactivity is transferred from the aircraft to the detergents, extreme care must be taken in disposal of the detergents. Radioactivity cannot be destroyed by any known mechanical or chemical means. Radioactivity is lost only through a process known as "decay" or "disintegration," in which it produces a series of isotopes until a non-radiating, stable isotope is reached. This is a matter of time, since man has no control over the aging or half-life of the various elements. Therefore, provisions had to be made for getting rid of the contaminated wastes.

We impound all of our waste water by constructing a temporary sandbag dam around the aircraft. The water is then monitored and contained in fifty-five-gallon drums if contaminated, or released into the ground or sewer if not contaminated. The contaminated water is stored until decay below the permissible limits takes place, or is metered into sewers at a rate below the permissible limit. Other liquids, such as oils or acids, are contained until proper disintegration has occurred, or they are disposed of by burial or shipped to plants which have the capability to extract the radioactive particles from the chemicals. Solids are allowed to decay to below the permissible limits, or are sealed in concrete and buried at controlled sites. The burning of contaminated wastes is not permitted unless the facility is capable of controlling the contaminated gases and residue.

Except for the monitoring equipment and special clothing to protect the workers from the spray, no extra equipment is necessary.

But our major problem is establishing a realistic permissible radiation limit for employees engaged in decontamination work. All limits used in the past were based on individual isotopes of specific atoms for which the exact rates of disintegrations were known. The limits were further based on isotopes which would do the greatest amount of harm to the body if the body were exposed to them.

In the contamination resulting from the detonation of a nuclear weapon, we are involved with mixed fission products. This means that the radioactive isotopes are many and varied. Some will decay to a stable state very rapidly, while others will remain radioactive for a long period. Since our equipment will register contamination to an average of these isotopes, it is reasonable to assume personnel will not be exposed exclusively to the most dangerous isotopes on which our permissible limits have been based. Therefore, we are faced with the fact that many manhours will be spent on decontaminating equipment which is really not above our contamination levels.

When we received our first engine for decontamination, we selected a group of monitors who had been trained in a previous class. Men to perform the actual decontamination and teardown operations came from the Engine Repair Shop. These men were thoroughly indoctrinated on decontamination procedures to be followed. The indoctrination was conducted by personnel of the Physiological Hazards Section and the Medical Department.

We wanted the engine to be the guinea pig, not the men. So, in the few hours available, we gave the engine technicians an intensely concentrated course on the hazards involved in the handling of this particular engine. They learned about the various types of radiation and how the different types could enter the body and what damage they could do. The anticipated levels of contamination were carefully explained. We outlined the strict regulations which would govern operation of the "change house," where the men would dress and undress before and after working on the engine, and why they should wear protective clothing. Lunch and break procedures were carefully spelled out for them.

It was also pointed out that this operation was being conducted to obtain factual data and operating procedures.

All parts of the engine were to be decontaminated to the extent that no controls would be necessary in the future handling and reworking of the parts. These controls are set by Air Force Technical Orders based on Air Force Special Weapons Center tests and reports. Acceptable levels for the Air Force are presently set as anything less than one milliroentgen per hour beta-gamma radiation at one inch from the surface when using survey meters, and 200,000 disintegrations per minute per 150 square centimeters removable beta-gamma radiation when using wipe samples. A milliroentgen is a measurement of radiation absorption and is 1/1,000 of a roentgen. Disintegration is a term used to denote decay of radioactive isotopes. Beta-gamma radiation

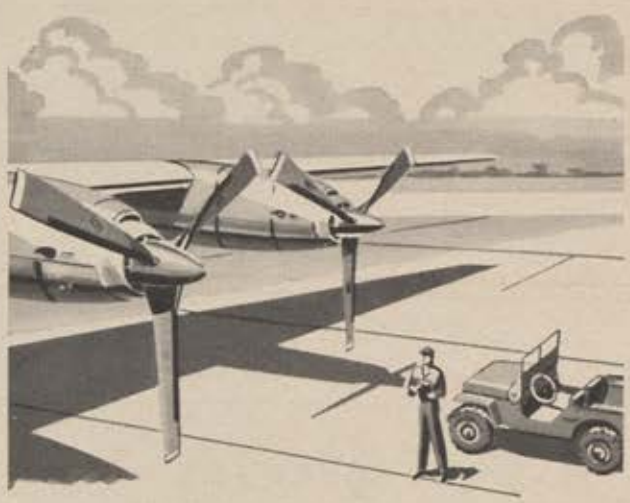
(Continued on page 77)

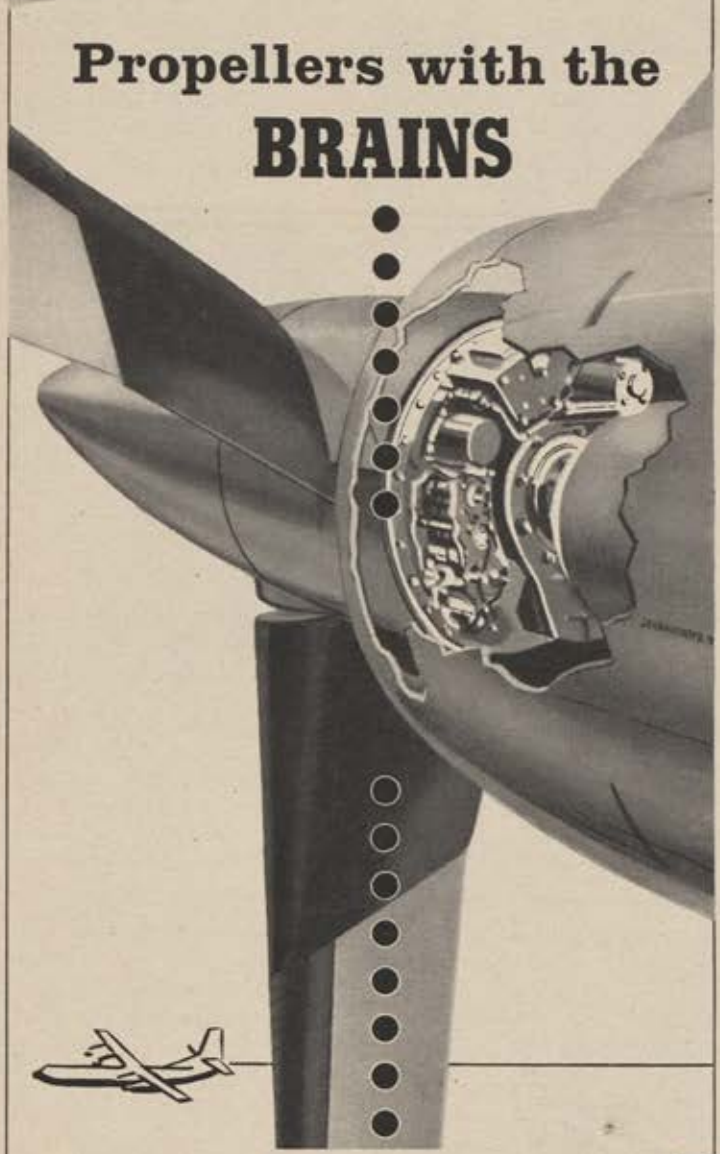
ABOUT THE AUTHOR

General Odom, a 1930 graduate of West Point, has commanded the San Antonio AMA, Kelly AFB, Tex., since March 1954. In WW II he commanded the 452d Bomb Group in the ETO, and later was Assistant Deputy for Operations of the US Strategic Air Forces in England. A graduate of the Command and General Staff College and the Army and Navy Staff College, General Odom also earned a master's degree in business administration from Harvard.

Curtiss-Wright TURBOLECTRICS

Propellers with the BRAINS





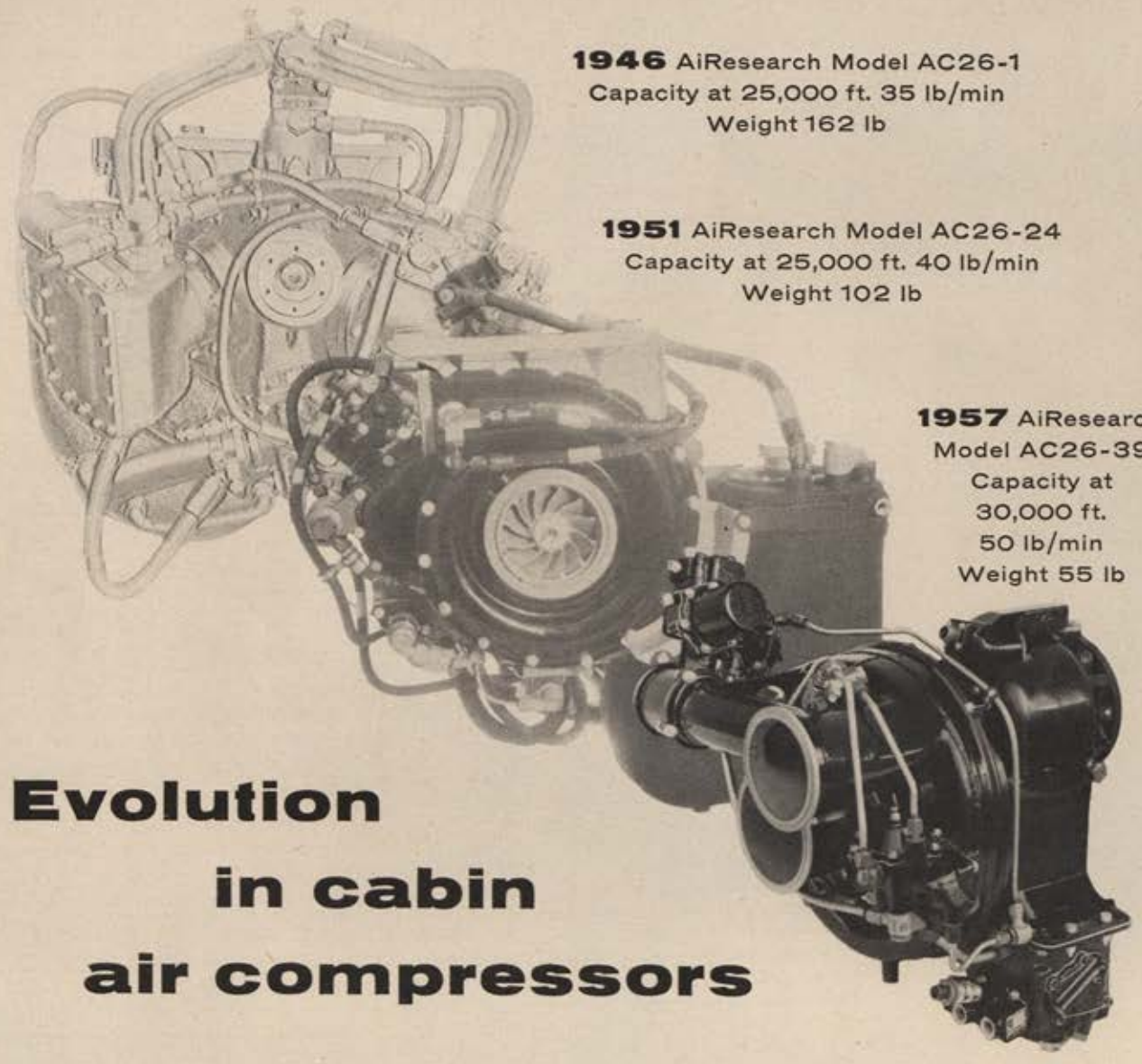
Converting the power of the new gas turbine or "turboprop" aircraft engines into useful thrust is a most exacting assignment for the time-honored propeller. It has to handle just about double any previous power . . . smooth out fast accelerations characteristic of these engines . . . control their power by the subtlest amount of pitch change on the blades . . . reverse to slow down and stop the momentum of some hundred tons of airplane.

With electromechanical brains for precise control . . . and with tough, one-piece extruded steel blades to handle unprecedented horsepower . . . Turbolectrics convert the basic operating efficiency of the turboprop into *flying* efficiency.

A leader in powerplant design, Curtiss-Wright also leads today in translation of turbine power into useful propeller thrust.

and BRAWN to TAME A TURBINE

PROPELLER DIVISION
CURTISS-WRIGHT
CORPORATION • CALDWELL, N. J.



New AiResearch unit weighs one-third as much, increases performance by 43%

The performance demands on aircraft cabin air compressors are constantly increasing. Yet weight and space limitation on these pressurization components becomes even more critical. Basic design advancement is the only solution.

AiResearch has achieved this in its new, engine-driven compressor for turboprop aircraft. Compared to earlier models, it increases output by 43% while actually cutting weight to one-third. Dependability and durability are assured by the company's extensive experience in the production of all types of cabin air compressors, including units for the latest jet transports.

Superior performance is further assured by our unmatched experience in developing compatible systems. AiResearch has assumed complete system responsibility in the field of pressurization for many of America's finest present and projected airliners. We invite your inquiries.

THE GARRETT CORPORATION

AiResearch Manufacturing Divisions

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Designers and manufacturers of aircraft and missile systems and components: REFRIGERATION SYSTEMS • PNEUMATIC VALVES AND CONTROLS • TEMPERATURE CONTROLS
CABIN AIR COMPRESSORS • TURBINE MOTORS • GAS TURBINE ENGINES • CABIN PRESSURE CONTROLS • HEAT TRANSFER EQUIPMENT • ELECTRO-MECHANICAL EQUIPMENT • ELECTRONIC COMPUTERS AND CONTROLS

is the only hazard considered since alpha radiation is not found in residual contamination to any great extent.

All of the parts first went through a regular cleaning cycle, which consisted of a soap and water steam cleaning, followed by a steam rinse, passage through the carbon removal solution, kerosene rinse, and final steam rinse. All parts which had readings below the acceptable limits were then placed at one side. Those reading above the limits were sent through the cycle again.

Hand-cleaning with brushes and kerosene was the next step for those recalcitrant pieces that still defied our Geiger counters. Other parts needed seed blasting, sand blasting, vapor blasting, and degreasing before all parts were acceptable. At the end of the operation, all of the clothing, tools, solutions, and work areas were monitored.

Personnel assigned to study the decontamination of this engine decided that the tear-down and cleaning procedures normally followed in the overhauling of non-contaminated engines could be utilized with minor variations and added precautions, such as the use of protective clothing and strict hygiene practices. This would reduce actual working time by about thirty percent, or a loss of approximately two and one-half hours per eight-hour day.

The number of contaminated engines or the length of the run through the line would have a direct bearing on the time lost as a result of the protective measures required. The longer personnel work under these necessary handicaps, the more proficient they become. Their effectiveness increases with mounting experience in accordance with the learning curve in almost the same degree as improvement occurs on new tasks undertaken under normal working conditions. Other requirements which would become necessary are trained monitoring personnel, monitoring equipment, protective clothing, and decontamination facilities.

Both as a help and a hindrance to mankind, radiation is here to stay. Therefore, decontamination must become a common word in Uncle Sam's military-industrial vocabulary. It presents many problems. It offers many challenges. But all its life the Air Force has met problems and accepted challenges. This is one of the more difficult ones, but the day will come soon when we can handle radiation as easily as we do our cigarettes.

And just as safely.—END

The READY ROOM

RESERVE AND AIR GUARD NEWS

Anita Ekberg, queen of 1954 Ricks Trophy Event, congratulates winner, New Jersey's Lt. Charles J. Young.

The 1955 winner, Ohio's Colonel Poston, is met by General Twining, Ann Francis, and the ANG's General Wilson.

Joanne Alford, AFA's Miss Airpower, and General Wilson greet '56 winner, Delaware's Maj. David McCallister.

Here's the Run-Down on '57 Ricks Trophy Event

Thirteen squadrons have been declared eligible to participate in this year's fourth annual running of the Air Force Association's **Earl T. Ricks Memorial Trophy Event,** which is a cross-country test for **Air National Guard jet pilots.**

July 28 is the big day for the Guard's top jet drivers as they compete for the huge Ricks Trophy over a **2,400-nautical-mile course** between **Fresno, Calif.,** and **Andrews Air Force Base,** Washington, D. C.

The 1957 event will be run with **Republic's F-84F and RF-84F Thunderstreaks.** And, for the first time, all pilots will be required to stop at prescribed refueling points. These are **Tucson, Ariz.; Dallas, Tex.; and Atlanta, Ga.** Each location houses an Air National Guard jet unit, and each plans a program to salute the Ricks competitors and the Fiftieth Anniversary of the Air Force, which is being sponsored nationally by the Air Force Association.

The National Guard Bureau has declared the following units eligible:

- 153d Tactical Reconnaissance Squadron, **Meridian, Miss.**
- 105th Tactical Reconnaissance Squadron, **Nashville, Tenn.**
- 155th Tactical Reconnaissance Squadron, **Memphis, Tenn.**
- 108th Fighter-Interceptor Squadron, **Chicago, Ill.**
- 168th Fighter-Interceptor Squadron, **Chicago, Ill.**
- 170th Fighter-Interceptor Squadron, **Springfield, Ill.**
- 146th Fighter-Interceptor Squadron, **Pittsburgh, Penna.**
- 147th Fighter-Interceptor Squadron, **Pittsburgh, Penna.**
- 128th Fighter-Interceptor Squadron, **Atlanta, Ga.**
- 158th Fighter-Interceptor Squadron, **Savannah, Ga.**
- 119th Fighter-Interceptor Squadron, **Trenton, N. J.**
- 160th Tactical Reconnaissance Squadron, **Montgomery, Ala.**
- 152d Fighter-Interceptor Squadron, **Tucson, Ariz.**

The competition is restricted to **one pilot from each** eligible squadron. The pilot selected must have a total of at least **500 hours of jet flying time** and **100 hours in the '84F.** In addition, he must possess a valid instrument card.

The aircraft will take off from Fresno Municipal Airport at approximately **five-minute intervals,** beginning at 7 a.m., Fresno time. Time spent on the ground for refueling will be deducted from the elapsed time. It is estimated that actual flying time for the distance will be **less than four hours and thirty minutes.**

The event was established in 1954 by the Air Force Association both to honor the memory of **Maj. Gen. Earl T. Ricks,** who died in January of that year while serving as chief of the Guard Bureau's Air Force Division, and to focus national attention on the high level of proficiency ANG pilots must maintain.

The first event was run between **Ontario, Calif., and Detroit, Mich.** It was won by **Lt. Charles J. Young** of New Jersey, who flew the 2,000-mile course in a North American **F-86 Sabrejet** in three hours, twenty-seven minutes, and thirteen seconds.

The **1955 event** covered the same route as the 1954 run. In 1955, however, all ANG jet squadrons were eligible to participate. **Twenty-two pilots,** representing as many squadrons in twenty-one different states, took part. Six different types of aircraft were flown. The winner, flying a **Republic F-84E Thunderjet,** was **Lt. Col. James A. Poston,** commander of Ohio's 166th Fighter Squadron, who covered the distance in the adjusted time of three hours and thirty-two minutes.

Last year, to eliminate the handicap system which was required in 1955 because of the different types of aircraft and to simplify the logistic-support problem, the Guard Bureau restricted the event to one type of airplane—**the Sabrejet.** The 1956 run covered 1,922 miles between **San Francisco and New Orleans** and was won by **Maj. David F. McCallister,** commander of Delaware's 142d Squadron, in three hours, thirty minutes, and eight seconds. McCallister averaged 547.68 miles per hour over the route.

A major **aerial demonstration** is being planned at Andrews on July 28 to salute the Ricks Event competitors and will include the appearance of the famed Air Force "**Thunderbirds**" precision acrobatic team.

In addition to the Ricks Trophy, which will be presented to the winner, plaques will be awarded to the pilots who finish in second, third, and fourth places. These awards will be made at the annual **Reserve Forces Awards dinner** in Washington on July 30, highlight of the **opening-day program of the Association's annual convention,** which will run through August 4.

(More Ready Room on Page 81)

NEW OPPORTUNITIES FOR EX-SERVICEMEN:

Read why your service skills and experience are now worth more than ever to you

Your valuable service skills are needed in the U.S. Air Force. A new liberalized policy today offers you even greater opportunities: a wider range of skills accepted, choice of assignments, paid 30-day delay in reporting, a more liberal conversion list for *all* ex-servicemen. And if you don't have a usable skill, you may, *before you sign up*—on the basis of aptitude testing—be *guaranteed* technical training in a needed skill. You may also be eligible for a bonus, or a return to service in grade. Find out *now* how your service experience can "pay off" in the U.S. Air Force! Mail the coupon, or see your local Air Force Recruiter.

TODAY AND TOMORROW YOU'RE BETTER OFF IN THE U.S. AIR FORCE

PASTE COUPON ON POST CARD AND MAIL TO

PRIOR SERVICE INFORMATION
P. O. BOX 7608
WASHINGTON 4, D. C.

V-55-AF4

Please send me more information on the Air Force Prior Service Program.

Name_____

Address_____ Age_____

City_____ Zone_____ State_____

How YOU can protect your FLIGHT PAY

Dear Sir:

. . . In August 1955 my family and I experienced a fire that practically destroyed everything we owned. We were plunged into debt buying the necessary furnishings and clothing in another home. Every dollar I earned was obligated in some way.

In December 1956 I was suspended from flying with a cardiac ailment and have been grounded since then.

If it had not been for your flight pay insurance (one check for $615 for December, January, and February flight pay) and subsequent checks for each month I have been grounded, it would have been next to impossible to get by. . . .

Sincerely,
Murray E. Whiteley
Ward W-2
Fitzsimmons Army General Hospital
Denver, Colo.

Here's how the plan works for AFA Members

You sign up and pay a premium of only one percent of your annual flight pay. Coverage for accidents becomes effective on the last day of the month in which you apply and pay your initial premium to AFA. For disease, protection goes into effect thirty days after the effective date of the contract (i.e., thirty days after the last day of the month in which you apply and pay your premium).

If you're grounded due to accidental bodily injury or disease contracted during the period of your coverage under the Plan, you collect monthly indemnity for loss of flight pay up to a maximum of twenty-four months. There is a waiting period of ninety days for grounding due to disease or non-aviation accidents; 180 days on aviation accidents. Reason is that, for disabilities of shorter duration, the government gives you a chance to make up for lost flight time, and to collect your regular flight pay. If you cannot do so, then the Flight Pay Protection Plan will pay you retroactively for flight pay lost during the period of disability.

All members of the US Air Force, Air National Guard, Air Reserve, and other military services who are on flight status and who belong to the Air Force Association are eligible. Even men currently flying on waivers can apply for protection; the policy won't cover groundings due to the cause for which the waiver was issued, but it will cover groundings due to accidents or due to other disease contracted during the period for which coverage is effective.

Of course, this coverage does not apply in case of war, declared or undeclared, or hostile action, civil war, invasion, or the resulting civil commotion or riots. There are also other exclusions which may never apply to you, but you are entitled to know them. They are as follows:

Plan does not cover primary duty requiring parachute jumping, or loses due to a criminal act of the AFA Member; or from bodily injury occurring while in a state of insanity (temporary or otherwise); or from officially certified "fear of flying"; or caused by intentional self-injury, attempted suicide, criminal assault committed by the Member, or fighting, except in self-defense; or from failure to meet flying proficiency standards unless caused by or aggravated by or attributed to disease or accident; or accidents caused while riding or driving in any kind of race; or by alcohol, drugs, venereal disease, arrest or confinement; or willful violation of flying regulations resulting in suspension from flying as a punitive measure; or sentence to dismissal from the service by a general court-martial, submitted resignation for the good of the service, or suspension from flying for administrative reasons not due to accident or disease or voluntary suspension.

The Plan does not cover losses to any Member resulting in whole or in part from a pre-existing disease or disability or recurrence thereof, for which a waiver has been authorized by appropriate medical authority. Loss of life shall not be deemed as a loss for purposes of this plan.

In the event you receive the total limit of twenty-four (24) months' indemnity, your coverage is automatically terminated. You may thereafter reapply for insurance coverage in the same manner as a new Member. Coverage, and the payment of indemnities, also end with termination of membership in AFA, or with resignation, retirement, or pensioning from the service, or at age sixty.

This insurance is renewable at the option of the Aetna Insurance Company.

Policy Form No. 1-620-3A

AIR FORCE ASSOCIATION FLIGHT PAY PROTECTION PLAN 757

Underwritten by AETNA INSURANCE COMPANY, 670 Main St., Hartford, Conn.

(please print) Rank Name Serial Number Yrs. Service for pay purposes

MAILING ADDRESS _____

AMOUNT OF ANNUAL FLIGHT PAY _____

I certify I am currently on flying status and entitled to receive incentive pay, and that to the best of my knowledge I am in good health, and that no action is pending to remove me from flying status for failure to meet physical standards.

SIGNATURE OF APPLICANT _____ DATE _____

Application must be accompanied by check or money order for annual premium.

The annual premium charge is one percent of ANNUAL flight pay.

Send remittance to Air Force Association, Mills Building, Washington 6, D. C.

There is a possibility that boards to consider Air Force **Reserve officers for promotion** will be convened in the future **more than once a year,** as is the case at the present time.

This came to light last month at the semi-annual meeting of the **Air Staff Committee on Air National Guard and Air Force Reserve Policy** during discussion of a motion sponsored by Reserve members for a policy that would make promotions between Guard and Reserve officers more equitable.

Under the present system, a Guard officer eligible for promotion appears before a federal recognition board. If approved by the board and, subsequently, by the National Guard Bureau and Air Force, his date of rank is effective **as of the time of his approval by the board.** Federal recognition boards may be convened at any time an officer is nominated to fill a unit vacancy. Any Reserve officer, on the other hand, who may be nominated for promotion, can be considered only when the promotion board meets yearly at the Records Center.

Reserve members of the committee requested that promotion boards meet at the Records Center **at least quarterly.** The request was **rejected in a full committee vote,** but Air Force notified the committee that the **Judge Advocate General** has ruled that it is legal to have more than one promotion board a year. As a result, an AF spokesman said, arrangements are being made with **Continental Air Command** to work out procedures for convening promotion boards more frequently.

The committee also was told that the Air Force expects to spend approximately **$22 million** in the fiscal year beginning this month **for Reserve construction.** In the fiscal year just ended, **more than $33 million** was obligated for Reserve construction, principally for flying units. As a result of the money spent thus far on Reserve flying facilities, there were **forty bases operational** at the end of last month. The money to be spent this fiscal year is expected to increase the number of operational bases to **forty-five.** This number will be required to support the eighteen troop carrier wings which are in the Reserve program at the present time.

Air Guard committee members succeeded in getting the Air Force to agree to **review current policy** which requires that Guard units provide **advanced combat crew training** at home stations to **graduates of the Guard pilot training program.**

The policy is causing concern in the Guard which has **limited resources** in full-time instructor pilots, T-33 type aircraft, and gunnery ranges. The Guard wants **Air Training Command** to continue to provide the combat training, but this command itself is **taxed to the limit** to provide Regular Air Force pilot graduates with the training they require for Century Series aircraft.

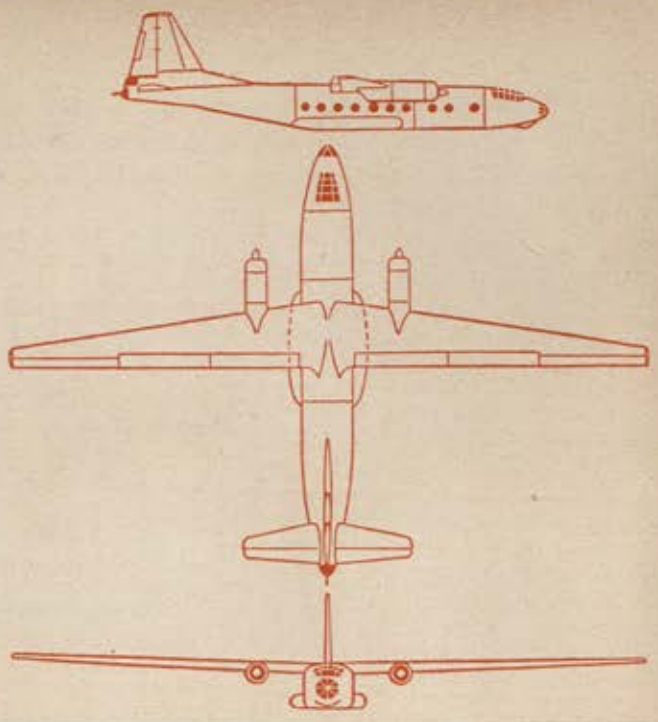
The Guard finds the problem **particularly acute** at the present time because it is in the process of **converting forty-four squadrons** to more modern and more complex **jet aircraft.** Transitioning veteran pilots to these aircraft will be a major undertaking on a part-time basis, and the situation will be made more difficult if combat crew training for new pilots in these aircraft is added to the normal transition program.

—Edmund F. Hogan

A Red Airpower Feature

THE AN-8

New Russian ASSAULT TRANSPORT



SPECIFICATIONS

Wingspan	134 ft., 6 in.	Vertical stabilizers	145 sq. ft.
Wing area	1,601 sq. ft.	Empty weight	46,200 lbs.
Fuselage length	90 ft., 2 in.	Gross weight	88,000 lbs.
Fuselage width	10 ft., 9 in.	Fuel	20,000 lbs.
Horizontal stabilizers	226 sq. ft.	Payload	19,800 lbs.
Power plants	Two turboprops, 5,100 eshp each		

Sovfoto

Another Antonov design is the new Russian transport AN-10 or Ukraina, which is powered by four turboprop engines.

WHEN they celebrated Aviation Day in June 1956, the Russians displayed several new aircraft, including one of a type not previously in their inventory. This was the prototype of an assault transport, the AN-8, in some ways resembling Fairchild's C-123B.

The new plane has a wide, thick fuselage, a high tail, a straight, high wing. It is powered by two turboprop engines of about 5,100 eshp (equivalent shaft horsepower) each.

The aircraft has a maximum gross weight of 88,000 pounds compared to a maximum gross weight of 60,000 pounds for the C-123B, and 74,000 pounds for another Fairchild plane, the C-119G Flying Boxcar.

The AN-8 is the design-product of one of Russia's lesser known aircraft designers, Oleg K. Antonov. Until his AN-8 appeared last year, Antonov had been credited outside Russia with only a single-engine design, the versatile AN-2. Since the AN-8 appeared last June, Antonov has turned out at least one model of a new transport aircraft—the AN-10—another high-wing design, powered by four turboprop engines of 4,000 eshp each. The latter, known as the Ukraina, recently was pictured in *Pravda* (*see cut*), which said the craft could carry eighty-four passengers and 3½ tons of cargo, that it cruises at 360 mph between 24,000 and 30,000 feet, and has a large door in the rear for loading freight.

The Russians now refer to the AN-10 as "an improved version of the AN-8." This could be an indication that the AN-8 was already destined for replacement when it flew past the reviewing stand at Tushino last year. Or it could mean that the AN-8 is being played down in favor of the more advanced model. This would be in keeping with the current party line, since the AN-10 is much more "civilian" than the clearly military AN-8.

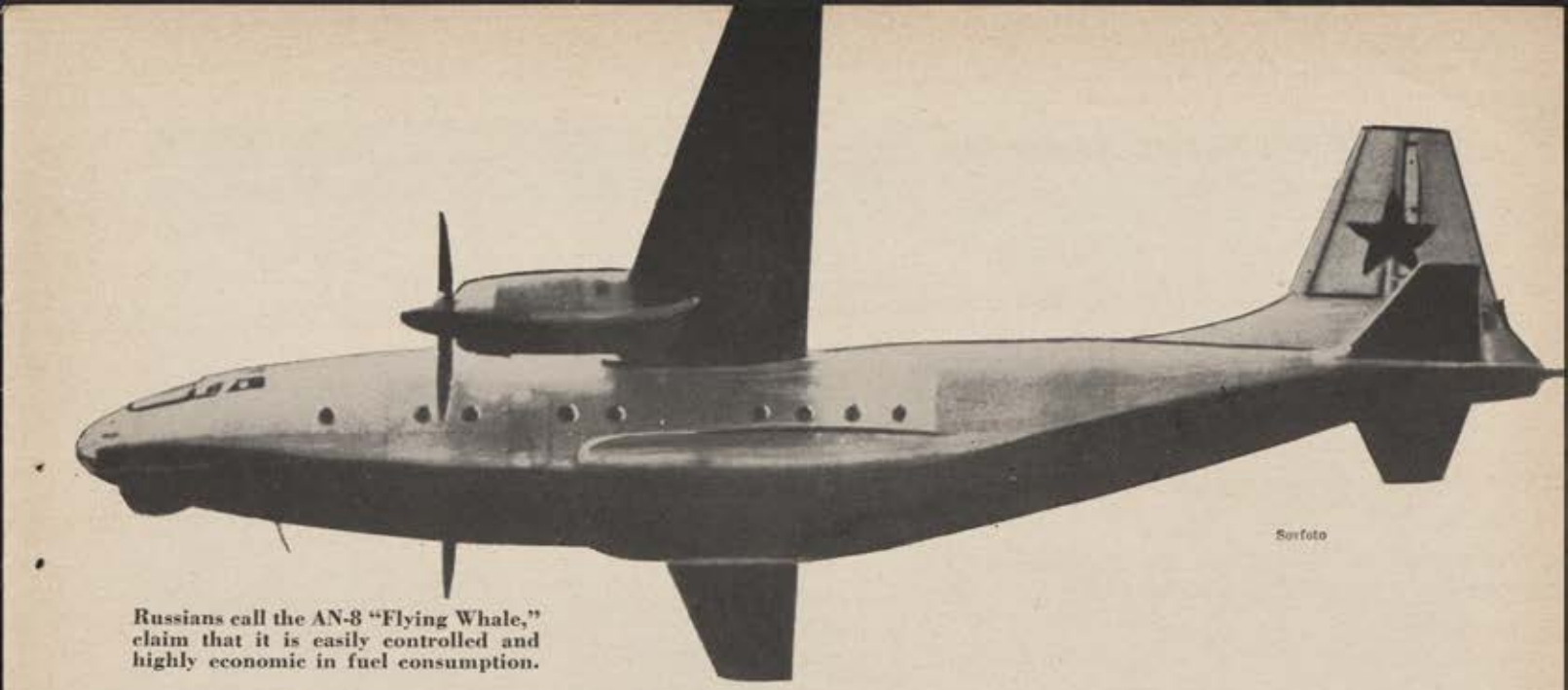
For their size, Antonov's aircraft are all characterized by their ability to get in and out of small fields. His single-engine AN-2 biplane is especially well suited to small-field operations. It is used widely in the northern regions of the USSR to carry passengers, freight, and mail; it is employed for various agricultural operations, such as insecticide spraying; and it often is seen in pictures of Soviet operations on the Polar ice cap. It has a military role similar to the Beaver built by de Havilland of Canada.

The AN-2 carries the NATO-designation Colt, while the AN-8 is known as Camp. Nothing is known of the AN-4 and AN-6, which would complete the Antonov series.

The AN-8 assault transport, only one of which has been seen, is a new equipment venture for the Soviet air forces. Their interest in this type aircraft is one more piece of evidence of growing Russian appreciation of airpower's transport or logistics role.

The aircraft has a large radome beneath the nose and is armed with at least two tail guns. The four-man crew includes a tail gunner, radar-navigator, and pilot and copilot. It has a service ceiling of about 30,000 feet at maximum gross weight. The AN-8's maximum flight speed is in the range of 320 to 340 mph, with a landing speed of 100 mph at near maximum weight and an absolute range of about 2,500 miles. The maximum payload is about 20,000 pounds.

Its two turboprop engines of 5,100 eshp each are based on a German design originally obtained as loot from the Junkers plant at Dessau, East Germany. This engine



Sovfoto

Russians call the AN-8 "Flying Whale," claim that it is easily controlled and highly economic in fuel consumption.

Sovfoto

Earlier Antonov design is an AN-2 Colt biplane. Here one is being refueled during first Soviet Antarctic expedition.

has been under development and in operational use in the USSR since 1949 or 1950, and is believed to have achieved a very high degree of perfection. Its specific fuel consumption is less than 0.60 pounds of fuel per horsepower per hour, and actually may be 0.54 lbs/hp/hr. Unlike the Soviet's big turboprop bomber, Bear, the AN-8 does not feature contra-rotating propellers. Other data on the aircraft can be found in the accompanying tables.

The AN-8 and the new Ukraina passenger-freight transport have identical short-legged landing gear that retract into pods in the side of the fat, flat-bottomed fuselage. The AN-8 has a large drop-type door in the rear through which paratroopers or equipment could be dropped. The USSR is known to have large airborne forces, and the new aircraft would appear to be ideally suited for their use. Similarly, the increasing mechanization of Soviet ground forces (now including some seventy-five armored and/or mechanized divisions) points to a need for a transport of the AN-8 type that can bring in troops, equipment, and maintenance crews. It also could be used to bring up equipment and supplies to forward airfields from which the Soviets operate interceptors, attack planes, and light bombers in keeping with their known pattern of air support for ground force actions. The fact that the AN-8 has some guns indicates that it would be used in close proximity to the front.

Whether or not the aircraft is in production is not known. Some reports indicate the Russians are not yet quite satisfied with the design, which may undergo some improvement before it finally is put into production to make its contribution to the growing Soviet inventory of modern airpower.—End

RATES OF CLIMB

This table gives the rates of climb at maximum power output for the AN-8 at two gross weights, 44 tons and 38.5 tons, as well as elapsed time to reach the indicated altitudes.

Altitude	Rates of Climb 44 tons gross weights	Rates of Climb 38.5 tons gross weights	Time to Altitude 44 tons minutes	Time to Altitude 38.5 tons minutes
From 0 ft.	33.5 fps	39.7 fps	—	—
10,000 ft.	23.6 fps	28.9 fps	6.0	5.0
20,000 ft.	13.1 fps	17.7 fps	15.0	12.0
26,000 ft.	5.9 fps	10.2 fps	26.5	20.0
33,000 ft.	—	2.5 fps	—	39.0

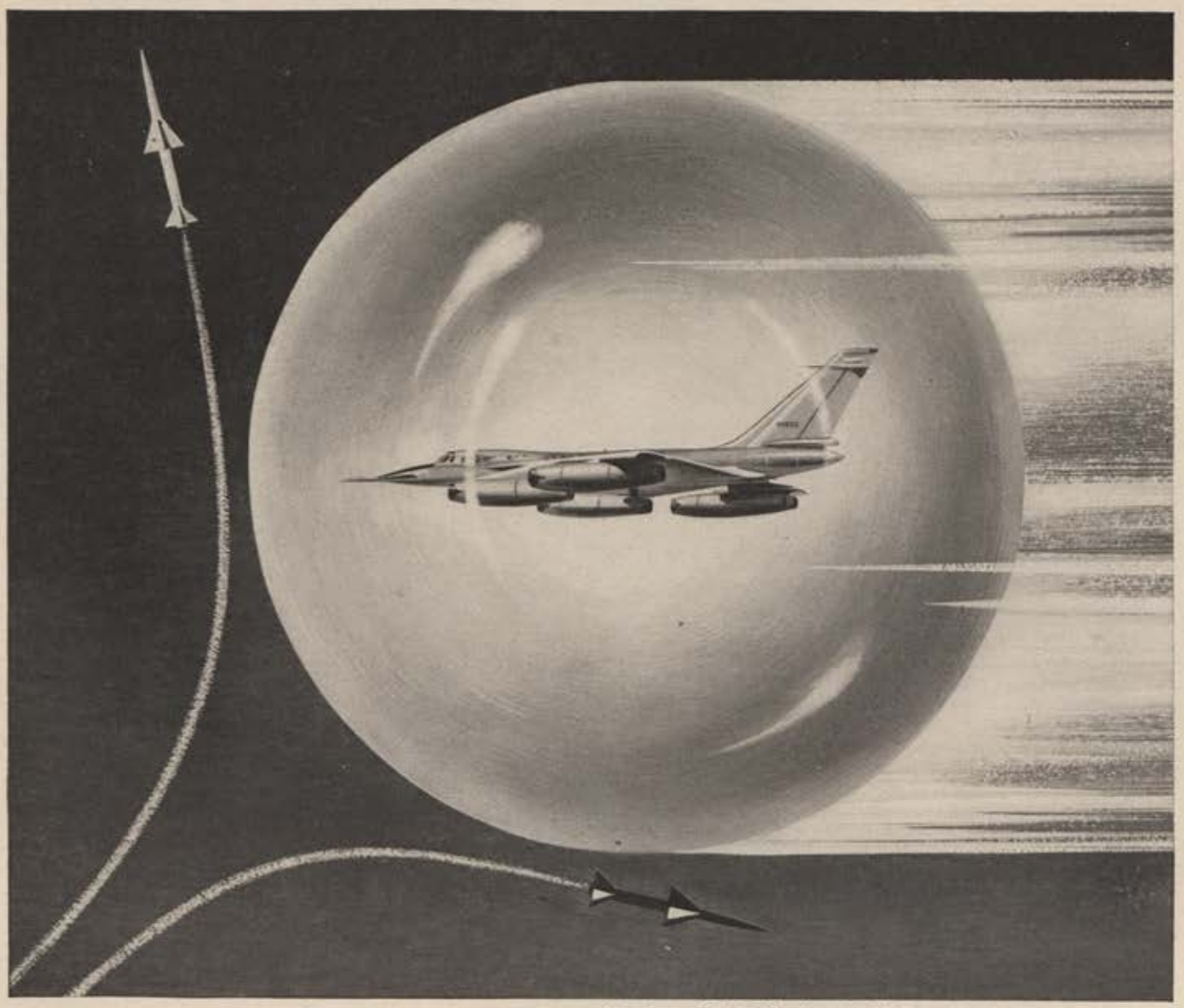
SERVICE CEILING

Service ceiling for the AN-8 has been determined for several gross weights. Service ceiling is determined when the rate of climb no longer can exceed 1.7 feet per second.

Gross Weight	Service Ceiling
44 tons	30,200 ft.
38.5 tons	34,300 ft.
33 tons	36,900 ft.
27.5 tons	40,800 ft.

MAXIMUM FLIGHT SPEEDS OF AN-8 AT VARIOUS ALTITUDES AND WEIGHTS

Altitude	Maximum Speed Gross Weight 44 tons	Maximum Speed Gross Weight 38.5 tons
From 0 ft.	324 mph	329 mph
10,000 ft.	327 mph	336 mph
20,000 ft.	322 mph	334 mph
26,000 ft.	307 mph	319 mph
33,000 ft.	—	279 mph



The Convair B-58 Hustler, first U. S. Air Force supersonic bomber, will be protected by Sylvania's electronic countermeasure equipment.

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Tech Talk

By Bob Strobell

Details of **blunt nose shapes for long-range missiles** were revealed when the **National Advisory Committee for Aeronautics** awarded **H. Julian Allen** its highest honor, **the Distinguished Service Medal** (*see "Airpower in the News," page 15*), for his work in this field. Long-range ballistic missiles, rocketing above the earth's atmosphere, **re-enter the atmosphere** at about **15,000 miles per hour** and are subject to extremely high temperatures (measured in thousands of degrees Fahrenheit) in the thin boundary layer of air surrounding the missile nose.

Missiles developed before 1952 were **sharply pointed** for minimum aerodynamic drag, but the needle nose cones could not dissipate the intense heat generated upon re-entry. Blunt nose-shape configurations, have a high drag force to **maximize the amount of heat delivered to the atmosphere** and **minimize the amount delivered to the nose** in the deceleration re-entry process.

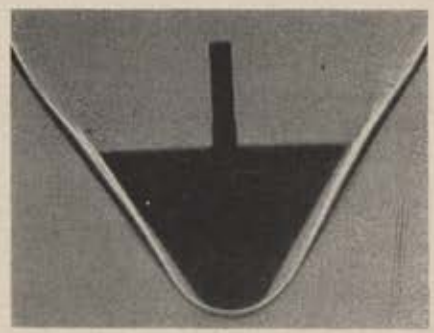
Blunt shapes **appear superior** to slender shapes from the standpoint of having lower maximum convective heat-transfer rates at the nose. In a hypothetical problem it is indicated that the blunt nose will absorb about **one percent of the heat** generated, while the slender or pointed nose will absorb about **fifty percent**—a critical difference when the problem deals with thousands of degrees of temperature higher than the melting point of most metals produced today.

The blunt shape, for explanation purposes, causes a **high-pressure drag,** creating intense heat in the shock wave surrounding it, but, because of its shape, the **heat follows** the wave and in a sense "slides" off the nose (*see cut*). The problem is far more complex than stated here, as velocity, gravity, deceleration, size, weight, specific heat, etc., must all be taken into account to design an appropriate blunt nose for a given problem.

The trick is to get the missile back to earth without vaporizing the nose and destroying the missile; for this, the blunt shape is the most promising solution.

More information about the **Ryan X-13 Vertijet** was released along with photographs (*see cut*), following the announcement last month of the X-13's first complete **cycle of vertical take-off, horizontal flight, and vertical landing** in one operational flight. Key to the VTOL flight is its ingenious **jet reaction control system** which provides complete control of the airplane during hovering and near-zero flight speed. This method was necessitated by the obvious lack of normal air flow over the aerodynamic control surfaces at low speeds.

The principle behind jet reaction controls is basically quite simple. Necessary forces are developed by **jet engine exhaust deflection and thrust (throttle) variations.** In addition to jet reaction controls, the plane is equipped with a **conventional aerodynamic control system** to provide control in conventional flight. The pilot operates



Test model of NACA's blunt nose cone for long-range ballistic missile will dissipate heat into the atmosphere.

both systems from the usual stick and rudder pedal cockpit controls.

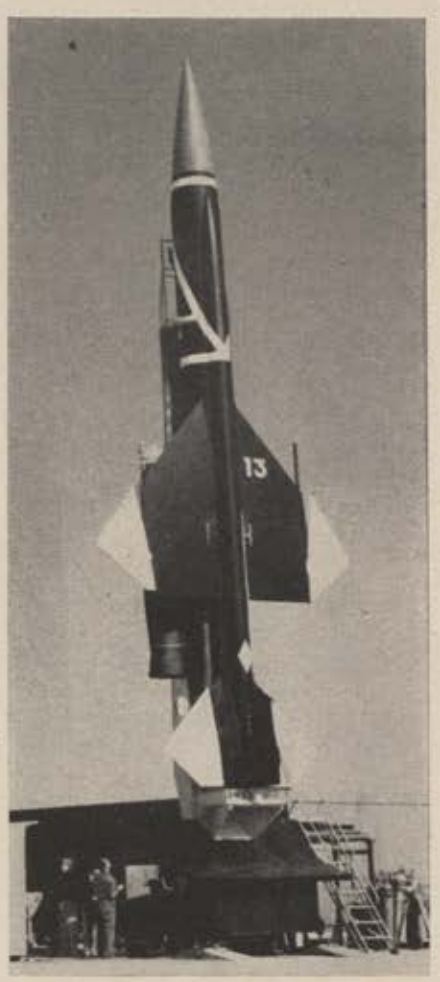
Another unique feature of the Vertijet is the method utilized for take-off and landing. The plane does not have a conventional landing gear, nor does it have the landing struts and casters usually associated with the "tail-sitter" type of VTOL airplane. Instead, it has **a single hook mounted beneath the forward fuselage** which engages a trapeze-like mechanism built into the bed of a specially designed ground-service trailer. Like the familiar dump truck, the bed of the trailer may be hydraulically lifted into a vertical position to receive the airplane, then lowered to transport it away in the horizontal position.

Unlike conventional combat planes, the jet VTOL would be able to take off and land tail down in an area **half the size of a tennis court.**

Length of the X-13 is approximately **twenty-four feet;** wingspan is about **twenty-one feet;** and the height is **fifteen feet.** The **Ryan Aeronautical Co.** has carried the design forward to high-performance supersonic VTOL jet fighters for use by both the Navy and the Air Force.

(Continued on following page)

Ryan X-13 Vertijet hovers before the landing trailer as it approaches for a hook-on landing at near zero speed.



Boeing's Bomarc is launched vertically by liquid fuel rocket motor. Two ramjet engines power the missile on its long-range flight toward the target.

F-101 Voodoo fighters refuel from new KB-50J tanker modified by Hayes Aircraft Corp. with two J-47 jet engines to increase the refueling speed of the tanker.

General Electric's J-79 jet engine can produce more than twice as much thrust as the company's famous J-47, though it is smaller and lighter than the J-47.

The **US Air Force and Boeing Airplane Co.** have jointly announced that a contract has been awarded to Boeing for production of the **IM-99 Bomarc** interceptor missile, designed to operate at **"extreme" altitudes and supersonic speeds,** with outstanding range characteristics, enabling it to "shoot down" enemy aircraft at far greater distances than any other missile presently in use in air defense.

Because of its range, the IM-99 is known as an **"area-defense weapon"** as opposed to short-range antiaircraft missiles known as "point-defense weapons."

The new missile is **launched vertically** by a **liquid fuel rocket motor.** When it reaches a speed suitable for **ramjet operation,** the rocket cuts out as twin ramjets (*see cut on page 85*) take over to provide supersonic cruise flight. The ramjets are slung on struts beneath the fuselage.

The weapon is described as about **forty-seven feet long**—ten feet longer than the F-86 Sabrejet interceptor—but has a wingspan of only **eighteen feet, two inches.** Its rocket motor is made by **Aerojet-General Corp.,** and the ramjet by **Marquardt Aircraft Co.** Bomarc will be operated by the **Air Defense Command** from bases where its capabilities may be fully utilized.

Nose cone for guided missile is made of Pyroceram, a crystalline material developed by the Corning Glass Works.

Hayes Aircraft Corp. has received a contract to modify Tactical Air Command **KB-50 tankers** by adding two **General Electric J-47** jet engines. This company originally converted the airplanes from bomber to tanker. The new designation for the jet version will be **KB-50J.**

The first of these tankers made a simulated refueling contact with **two McDonnell F-101s** on its flight from Birmingham, Ala., to the Wright Air Development Center, Dayton, Ohio. The tanker will undergo more than one hundred hours of flight testing at WADC.

The tanker's speed, altitude, and fuel-carrying capacity have been boosted by the addition of the two jets, which generate a **total of 12,000 pounds of thrust.** They can be used as a booster to the four reciprocating engines, which are the conventional power plants for the KB-50.

The two jets are pod-mounted (*see cut*) midway between the outboard engines and wing tips. The speed of the tanker during refueling operations will be increased so that the fast **jet fighters will not have to slow down to near stalling speeds** when filling their tanks.

The KB-50J is a **"three-point" tanker**—capable of refueling three aircraft at the same time. The refueling system used is the "probe and drogue," manufactured by Flight Refueling, Inc.

General Electric has unveiled its **J-79 turbojet engine** and, at the same time, announced that the engine, which is in the **10,000-pound-thrust** class, produces more thrust per pound of engine weight than any other large jet engine in production today.

The most important feature of the **J-79** (*see cut*) is the **use of variable stators** to provide a smooth flow of air inside the engine at all speeds, thus **eliminating the "stall barrier" problem.** The device, based on an old principle, accomplishes this by changing the pitch angle of blades in the engine's compression section. The pitch of the stator blades is automatically controlled to adjust air flow in the engine as the engine speed changes.

Of the seventeen stages in the J-79 compressor, six, plus the inlet guide vanes, are variable. In a conventional jet engine, the angle of the blades normally is fixed.

Though the J-79 can produce more than twice as much thrust as GE's J-47 jet engine, it is **smaller than the J-47.** It has a diameter of approximately **three feet,** a length of about **seventeen feet,** and is lighter in weight.

The J-79 had its first flight in Lockheed's supersonic fighter—the **F-104**

Starfighter. Six months after this flight four J-79s powered the first flight of **Convair's B-58 Hustler,** America's first supersonic bomber.

The development of a **whole family of new materials** has been announced by **Corning Glass Works.** They are tough, heat-resistant substances, **harder than steel, lighter than aluminum, and nine times stronger than plate glass.** Corning calls the new material **Pyroceram.**

Radome-nose cones (*see cut*) for **guided missiles** are the first commercial items produced from Pyroceram. The nose cone **protects the sensitive directional instruments in the nose** of the missile from sudden high temperatures experienced in hypersonic flight.

By a revolutionary manufacturing process, non-crystalline glass is turned into a **hard non-porous crystalline material.** The material starts as glass and can be formed like glass by conventional blowing, pressing, drawing, or spinning techniques. In final form, it can be transparent, opaque, or milky white.

The strength-to-weight ratio of Pyroceram is **greater than that of titanium or stainless steel.** Certain types of Pyroceram keep their strength at temperatures as high as **1,300 degrees Fahrenheit,** while that used in the nose cones will not soften until it reaches **2,460 degrees,** which is above the melting point of some stainless steels. Corning foresees the use of Pyroceram in parts for supersonic aircraft and jet engine components.

According to **F. A. Cleveland,** a scientist at **Lockheed Aircraft Corporation's Georgia Division,** the development of a **nuclear-powered bomber** will strengthen the Western world's military position by providing an aircraft of **"infinite range."**

Cleveland directs the preliminary design studies on nuclear-powered aircraft for Lockheed. He points out that **conventional power plants** are now reaching the **limit of their range,** and **air-to-air refueling** is required to obtain acceptable radii of operations. The strategic bomber will be the most likely first candidate for the nuclear plane.

Discussing the problems of a nuclear plane, the Lockheed engineer offered ideas concerning the airframe along the following lines. Since it is necessary to keep the reactor close to the engine and reduce the heat-transfer problem, the **power plant might be inside the fuselage** instead of on the wings. It would be possible to eliminate the engine, landing gear, and fuel from the wings, which would enable the wings to be thinner, cleaner, simpler, and more efficient.

By **reflecting radio signals off meteor trails,** a unique medium-range **communications link** has been established between **Stanford Research Institute,** Stanford, Calif., and **Montana State College,** Bozeman, Mont.

Tests have been successful in voice as well as teletype communications. Initial studies of **forward-scatterings from meteor trails** were performed for the ARDC facility at Stanford, Calif.

Operating in the VHF range, the two stations reflected radio signals off the meteor trails that occur **about sixty miles above the earth's surface.** The meteors create trails of ionized air that function like reflecting wire arrays.

Because of the small size of the meteors and the varying time intervals between their appearance, **continuous transmission is not possible.** Therefore, for maximum utilization of time, messages are transmitted at several times the standard teletype rate.—END

FICo engineers and produces the guidance for the Redstone Missile.
U.S. Army Photo

FICo navigational equipment goes into a wide range of aircraft.
U.S. Air Force Photo

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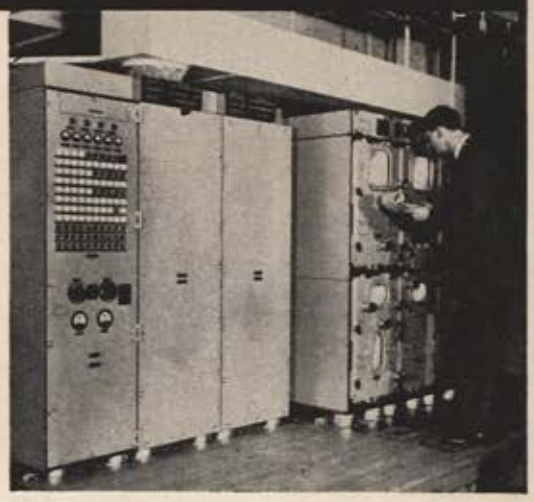
FICo controls are used in the atomic submarine program. FICo is also working toward development of the closed-cycle gas-cooled reactor.
U.S. Navy Photo

FICo research and design led to improved safety and arming device for Army atomic cannon.
U.S. Army Photo



FICo analog and digital computers can be readily developed and produced—using modular techniques—for special purpose applications.

FICo launching and control order computers are used for Navy A-A missiles.—*U.S. Navy Photo*

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In the front line of Canada's air defense are twelve squadrons of these sleek Avro CF-100 all-weather interceptors.

Our Busy Allies—The CANADIANS

By James Hornick

CF-100 navigators plot course they'll fly to new night-fighter duties with NATO in Europe. Four such squadrons are now in France.

RENDERING yeoman service today in the Middle East is a heterogeneous collection of unarmed aircraft, stripped of national insignia, offering no offense, and garnering little praise. It is the closest approach yet to an extranational air arm of the United Nations.

The four C-119 Flying Boxcars, two C-47 Dakotas, and four U1-A Otters are supplied and manned by the Royal Canadian Air Force. In their first few months, plying the UN Emergency Force supply route between Capodichino, Italy, and Abu Suweir, Egypt, and performing local errands in the troubled region of the Suez Canal, they carried more than 3,000 personnel and 800,000 pounds of freight. When flying was suspended for two days, rations for the troops dropped to less than one day's supply.

A twofold tribute is implied here: first, to Canada's undisputed integrity as a champion of UN principles (after all, it was Canada who proposed the Emergency Force, provided its commander, and made the first pledge of troops and equipment); second, to the flexibility of her Air Force—its resources already strained, its commitments increasing relentlessly.

(Continued on following page)

With famed Mount Vesuvius in the background, this RCAF C-119 prepares to take off for UN duties in the Middle East.

Canada's Orenda engine is said to give Sabre Mark VI an edge over AF's F-86E.

The twelve full-time squadrons of Air Defense Command and six of its part-time squadrons are in the process of receiving, respectively, the Mark V, higher-altitude version of the Canadian-designed CF-100 all-weather fighter, and the Mark V, higher-and-faster version of the Canadian-built F-86 Sabre. It is expected that many of the CF-100s—now carrying belly-mounted machine guns and 2.75-inch, folding-fin rockets in wingtip pods—will be re-armed with Canadian-manufactured US Sparrow air-to-air missiles.

Number One Air Division, Canada's twelve-squadron contribution to NATO, is also getting new equipment. Four squadrons are being converted to new-model CF-100s, while the remaining eight have traded their Sabre Vs for higher-powered Sabre VIs. (The Canadian-designed Orenda 14 engine of the Sabre VI, delivering 7,300 pounds of thrust, is said to give this aircraft a twenty percent margin in performance over the USAF's F-86E.) The Air Division, part of the Fourth Allied Tactical Air Force, has its headquarters at Metz, France, with a logistics base in Britain, two wings in France, and two in Germany.

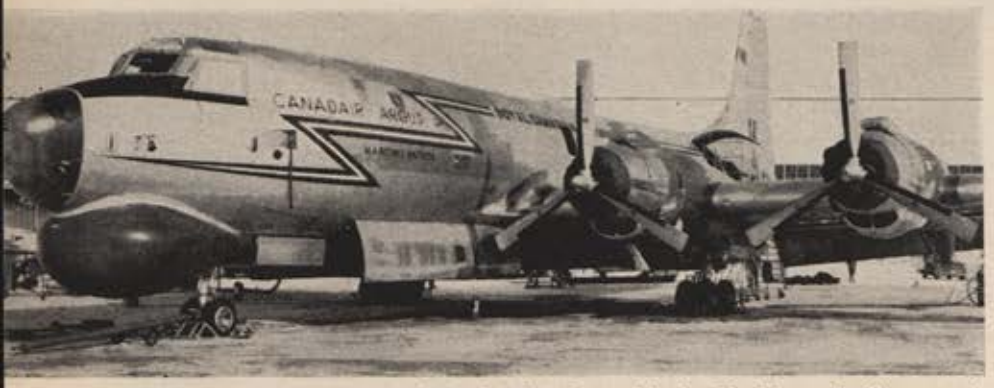
The RCAF Auxiliary (Reserve) is being streamlined, too. All of its British-built, eight-year-old de Havilland Vampire jets and World War II US-built P-51 Mustang piston-engine fighters have been retired. Six squadrons are, as has been noted, getting Sabre Vs. Under the new system an auxiliary fighter squadron has eight Sabres, four T-33 Silver Stars, and two T-6 Harvard trainers. Two squadrons will continue to operate B-25 Mitchells in a tactical role, and one will fly light transports.

Maritime Air Command, with two squadrons on the East Coast and one on the West Coast, is awaiting delivery of its first Canadian-built CL-28 Argus reconnaissance aircraft—a drastically modified version of the four-engine, seventy-five-ton Bristol Britannia airliner. (Its manufacturer immodestly says of the CL-28: "No other plane yet built can see farther, hear better, or kill submarines with more power and deadly accuracy.") Meantime, Maritime Air Command is operating US-built P2V-7 Neptunes and a dwindling number of World War II Canadian-built Lancaster bombers.

Air Transport Command, with five squadrons, is awaiting delivery of the Canadian-built CL-44, a turboprop adaptation of the CL-28 sub-hunter. Its present equipment is a mixed bag: Canadian-built North Stars (a British-powered compromise between the DC-4 and the DC-6), US-built C-119s, C-47 Dakotas, and C-45 Expeditors. Its two de Havilland Comet 1-A jet transports are being extensively modified in Britain to permit continued safe operation at high altitudes. These aircraft will be reserved for VIPs.

As the re-equipment program proceeds, surplus aircraft are offered to Canada's NATO allies—some 600 aircraft and more than 1,000 aircraft engines thus far. The latest allocation comprised seventy-five Sabre Vs, plus spares, for the new West German Air Force. Previously, 370 Sabres were given to Britain, about 200 split between Greece and Turkey, and a few turned over to Yugoslavia.

(Continued on page 93)



Sub-killing CL-28 Argus is scheduled for duty with the Maritime Air Command.

US-built P2V-7 Neptunes patrol coastline in Maritime Air Command service.

The venerable Dakota (C-47) illustrates the long arm of RCAF vigilance as it makes an emergency call at a remote Eskimo village deep in the frozen wastes.

As junior partner of the United States Air Force in the air defense of North America, and as a substantial contributor to the North Atlantic Treaty Organization, the 50,000-member, forty-one squadron, 3,000-plane RCAF is shouldering the heaviest responsibility in its peacetime history. The Canadian citizen finds that airpower is the biggest single item on his tax bill—more than $1 billion a year.

The present emphasis, after a six-year build-up period, is on modernization and re-equipment—on increasing operational capability within the forty-one-squadron limit established by Parliament. Three years ago, less than one-fourteenth of RCAF flying was in jets; now it has reached one-third. Record appropriations are being made for research and development.

MOTOROLA RADAR PICKETS IN THE "DEW-LINE" FENCE

Stretching 3,000 miles across the Arctic, special Motorola radar systems stand alert, ready to sound a warning at the first indication of an air attack over the polar cap.

The urgency of this distant early warning system called for a "crash" program for both development and production. Working in turn with the Lincoln Laboratories at M.I.T., Bell Telephone Laboratories, and the Western Electric Company, Inc., Motorola engineers came through with radar systems for the complete line within a 14-month period.

This is only one example of the military electronic equipment being developed and produced by Motorola for the varied military applications.

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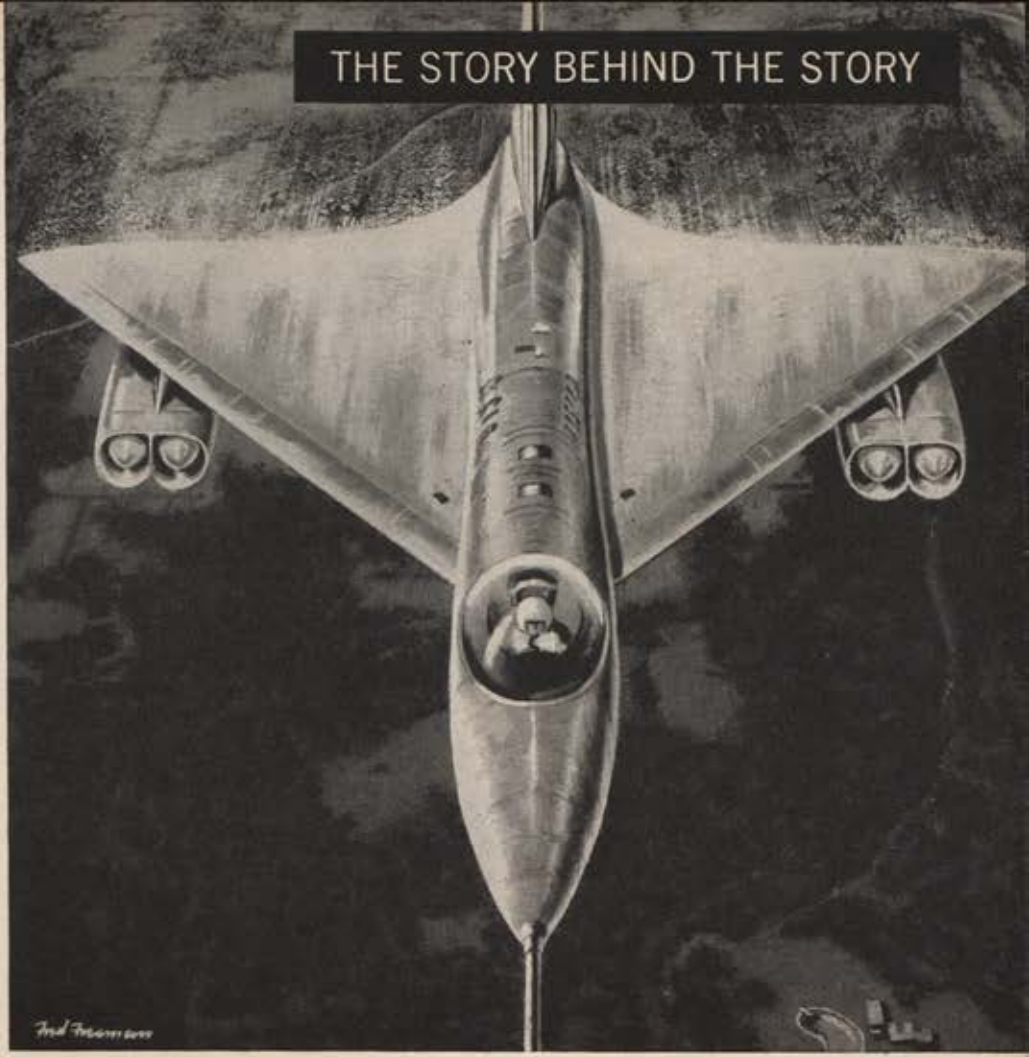
Beacons

MISSILE CRUISER–Problem: To launch a missile 1500 miles from target. An error of only 1 degree in launching information would cause a 25-mile target miss.



SUPERSONIC BOMBER–Problem: To navigate undetected for thousands of miles to exact position in space for release of bombs or missiles.

INERTIAL NAVIGATION:

In Its Accuracy Lies Power for Peace

ATOMIC SUBMARINE – Problem: To travel submerged for days and know exact spot to surface for missile firing.

U. S. strategy for maintaining peace by making aggression unprofitable is based on our ability to deliver a crushing retaliatory blow anywhere in the world. Accurate means of directing such blows at long range, high speeds and extreme altitudes make would-be aggressors wary of breaking the peace.

To be effective, weapon carriers must know at all times *exactly* where they are. For example, the long-range bomber with its pinpoint target or the pitching cruiser launching missiles far at sea must navigate with great accuracy.

Solving such problems is the task of Inertial Navigation systems which furnish all data required *automatically*. Completely self-contained within the bomber, ship, submarine or missile, these Inertial Navigation systems require no contact with ground stations. This is extremely important when military missions must be carried on without chance of detection.

To design and engineer Inertial Navigation systems involves a complex combination of engineering skills–gyroscopics, computation, electronics, servomechanics and more. Their production calls for laboratory precision at every stage. For example, the gyroscopes which form the heart of Inertial Navigation systems must be many times more accurate than those used in commercial navigation.

At Sperry, Inertial Navigation systems are being produced for a wide variety of military applications.

SPERRY GYROSCOPE COMPANY
Great Neck, New York

DIVISION OF SPERRY RAND CORPORATION

On a purely commercial basis, Canada has recently sold 225 Sabre VIs to West Germany (for $75 million); thirty-four to South Africa (for $10 million), and six to Colombia (for $3 million). An Israeli order for twenty-four has been withheld on government instructions pending an easing of Middle East tensions.

Canada continues to train NATO pilots and navigators. RCAF establishments have trained about 4,500 such aircrew candidates from Britain, France, Italy, Norway, Denmark, the Netherlands, Belgium, Greece, Turkey, and Portugal. The latest group accepted consists of 360 members of the West German Air Force. The cost of the program has already run to an estimated $350 million.

RCAF pilot training, incidentally, has reverted to a three-stage progression. Hitherto, flight cadets commenced training on T-6 Harvards, then advanced to T-33 Silver Stars. Now, they start on the Canadian-designed de Havilland Chipmunk, a comparatively simple, low-powered aircraft, before graduating to the Harvard. The RCAF is evaluating several types of jet primary trainers, including one designed by a Canadian manufacturer.

The main burden of work has been completed on the two early warning radar chains stretching across Canada's northland, the US-financed, $400 million Distant Early Warning Line and the Canadian-financed, $200 million Mid-Canada Line. Additions are being made to the more southerly Pine Tree Line, financed two-thirds by the US and one-third by Canada. The first two lines are intended to provide warning of a bomber attack, and the third to exercise control of intercepting aircraft.

The airlift effort required by the DEW and Mid-Canada Lines has been monumental. On the DEW Line alone, a recent summary showed that about 35,000 flights had been made (29,000 by Canadian aircraft) and 17,000,000 air miles covered. Sixty aircraft had been lost and twenty-five air crewmen killed. During one construction phase of the Mid-Canada Line, Canadian civil operators were flying fourteen PBY Canso freighters and nine DC-3s, while the RCAF provided a squadron of C-119s and twenty-two helicopters. The Royal Canadian Navy provided six helicopters.

Supplementing the radar lines is the RCAF's Ground Observer Corps—40,000 civilian volunteers manning be-

(Continued on following page)

T-33 with British Nene engine shows why it's Canada's favorite jet trainer.

Typifying the men responsible for maintaining the high RCAF flying standards, five young jet instructors return from a training flight at an RCAF airfield.

A Canso PBY flying laboratory tests mineral detection electronic equipment.

tween 4,000 and 5,000 spotting posts located about eight miles apart throughout the country.

The Royal Canadian Navy—now devoting about twenty-five percent of its manpower and budget to aviation—took delivery this year of a new aircraft carrier, the $26.5 million, British-built, 19,000-ton HMCS *Bonaventure*. She is equipped with an angled deck, steam catapult, and stabilized mirror landing aid, and will carry Canadian-built CS2F-1 Tracker anti-submarine aircraft and US-built F2H-3 Banshee fighters and HO4S-3 helicopters. Orders totaling $116 million have been placed for Trackers; another $27 million was paid to the United States government for thirty-nine Banshees.

Army aviation in Canada is still, after several faltering years, in its infancy. It consists of a handful of US-built Cessna L-19 observation aircraft and Bell 47 helicopters. Interest has been expressed in the forthcoming, Canadian-designed de Havilland DHC-4 Caribou twin-engine troop transport.

Standing behind Canadian airpower is a manufacturing industry the like of which the nation has never known in war or peace. It consists of four major aircraft plants, three aircraft engine plants, and forty-two plants in which the manufacture of aircraft or engine parts is either the whole or chief occupation. Some 35,000 persons are directly employed by the industry and another 35,000 are employed by supplier companies. Aviation manufacturing ranks third in Canada in total number of employees and eighth in the value of its products.

The Canadian government spent some $120 million before taking delivery of its first home-designed CF-100 all-weather fighter. But that investment has reaped some handsome dividends. It enabled Avro Canada Ltd. to lay the foundations for a diversified aircraft and engine design and manufacturing complex unsurpassed anywhere in the British Commonwealth.

In the early stages of the Orenda jet engine program, ninety-five percent of the components came from outside the country. Today, ninety-five percent of the components are manufactured in Canada.

Avro, in addition to manufacturing improved versions of the CF-100 and the Orenda engine which powers it, is working on the CF-100's projected successor, the delta-wing, 1,500-mph CF-105, due to fly about mid-1958. Current estimates of design and development costs before the first CF-105 takes to the air run to $200 million. Under contract to the US Air Force, and under heavy security wraps, Avro is also continuing research on Project Y, a semi-saucer-shaped, vertical-rising aircraft.

Recently, and reluctantly, Avro consigned its record-breaking C-102 Jetliner—the first jet-propelled airliner to fly in North America—to the scrap heap. The four-engine, twenty-six-ton, fifty-passenger Jetliner, developed at a cost of nearly $9 million, first flew on August 10, 1949. Airline orders were in prospect when Avro was compelled to suspend development to concentrate on defense orders. The prototype was usefully employed for the next few years as a flying testbed for electronics equipment.

An Avro subsidiary, Canadian Car and Foundry Co., holds world manufacturing rights to the T-6 Harvard trainer and has built both this type and the T-34 Mentor trainer for the US Air Force.

Canadair Ltd. of Montreal has, since 1951, built under license more than 1,600 Sabres and 500 T-33 Silver Stars. Its current challenge is the CL-28 Argus maritime reconnaissance aircraft—the largest aircraft ever built in Canada. Although the Argus was based on the civil Bristol Britannia, some sixty percent of the structure was redesigned to meet the military requirement.

De Havilland Aircraft of Canada Ltd., at Toronto, has built more than 1,000 single-engine L-20 Beavers and about 200 U1-A Otters and still has its order books full. Its fourth all-Canadian design (the Chipmunk trainer was the first) is the DHC-4 Caribou, which may fly this year. Considerable interest in this aircraft has been evidenced both by the Canadian and US Armies.

The only new all-Canadian aircraft engine in a stage of advanced development is the Iroquois, a product of the Avro-owned Orenda Engines Ltd. of Toronto. The Iroquois, slated to power the supersonic CF-105, is said to have a capability of 20,000 pounds' thrust. It is to be flight tested in a B-47 Stratojet loaned to the RCAF by the USAF. The engine will be mounted in a pod slung from a pylon on the right and to the rear of the fuselage under the stabilizer.

Canada's other engine manufacturers are Canadian Pratt & Whitney of Montreal, which turns out the piston engines for the Beaver, Otter, and Sentinel sub-hunter, and Rolls Royce of Canada at Montreal, which builds the British-designed Nene engines used in the T-33 Silver Star trainer.

If nothing else is indicated in this compilation of hard facts and figures, it must appear clear that Canada, a nation of 16,000,000, is pulling its full weight as the junior airpower partner of the United States.—END

ABOUT THE AUTHOR

Mr. Hornick was recently appointed feature editor of the Toronto Globe and Mail, *after having served for ten years as the newspaper's aviation reporter. In that capacity he traveled throughout Canada's ten provinces, to Europe, and to many parts of the US. He has received a number of awards for his aviation writing, including three prizes in 1955 in the annual Canadian Aviation Writing Awards contest. Mr. Hornick's byline last appeared in this magazine in June '54, with his article "Canadian Aviation."*

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Recently three B-52 bombers flew around the world in 45 hours and 19 minutes. They were only specks in the vastness of the sky, yet they were in voice-contact every mile of the way—with SAC headquarters in Omaha, with each other, with bases along the route and with the KC-97 tankers that refueled them in the air.

Their speed-of-light contact was the AN/ARC-21 liaison communications set in each of the ships. This is a long-range, pressurized, high-altitude airborne system, capable of world-wide communications. It may be operated by the pilot, so no radio operator is needed. It is characterized by minimum training requirements, simplified maintenance, high reliability, positive channel selection —with a choice of any 20 of 44,000 frequencies.

In this as in other ways, RCA serves our Nation's armed forces. RCA scientists and engineers are constantly creating, designing and producing new and better electronic systems and equipment.

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RADIO CORPORATION of AMERICA

DEFENSE ELECTRONIC PRODUCTS *CAMDEN, N. J.*

AFA NEWS

SQUADRON OF THE MONTH

San Diego Squadron, Calif., Cited for

its outstanding contributions to the development of airpower through sponsorship of the ninth annual California Wing Convention.

At California Wing Convention, Curt Christensen accepts USAF plaque commemorating Golden Anniversary from Col. Dean Hess. Looking on are Miss Barbara Lang, official Convention Hostess, and AFA President John Henebry.

Discussing Wing program with Jimmy Stewart are Christensen; Col. Hess; "Bud" Mahurin, WW II and Korean fighter ace; Capt. Iven Kincheloe, ARDC test pilot; and T. Claude Ryan, founder of the firm that built Lindbergh's plane.

The largest crowd ever to attend a **California Wing Convention** helped make this year's **three-day conclave in San Diego** an outstanding success. In addition to its regular Wing meeting, the program paid tribute to the **thirtieth anniversary of Lindbergh's transatlantic flight** and also to the **Air Force Golden Anniversary.** A civic celebration at the spot of Lindbergh's takeoff was highlighted when a replica of the "Spirit of St. Louis" landed where the original had taken off for New York exactly thirty years earlier. An AFA-Community Dinner featured talks by **Gen. George C. Kenney,** past AFA president, and Jimmy Stewart (*see cut*), who portrays Lindbergh in the Warner Brothers' film.

Saturday's business session, at which **eighteen** of California's twenty-two Squadrons were present, was followed by the Golden Anniversary Luncheon. **Maj. Alexander P. de Seversky,** famed aviation expert and writer, was the principal speaker. That night, the Wing held its Anniversary Wing-Ding Ball, complete with an Air Force birthday cake and stage show. At the annual brunch held Sunday morning, Wing awards were made and new officers installed. **Harvey McKay** of Sacramento is the new Wing Commander, and **Mrs. Charlotte Goldberg** succeeds **Mrs. Grace Brinke** as Wing Auxiliary President.

Among those who contributed to make this one of the best Wing conventions ever staged were **Frank and Elinore Brazda** and **Jim Snapp,** who served as chairmen. **Ned Root** and **Fred Hamlin** of Convair also deserve special mention for their untiring efforts, as does the San Diego Squadron and Auxiliary. The entire California Wing rates a salute for its 1957 Convention.

Here's one group of students in a science class at Long Island's Oyster Bay High School, taking part in the Arnold Squadron's airpower essay contest.

Some two hundred junior and senior high school students submitted essays (*see cut*) during the **H. H. Arnold Squadron's "Pioneer Day" program** at Long Island (*see* "AFA News," June '57). Each was taken on a flight as a reward for the essay on the subject "Aviation Today and Tomorrow." The **four top essayists**—Paul Viebroch, Bill Bollinger, Walter Sevian, and Barbara Meyers—won trips to the **Smithsonian Institution** in Washington, D. C., and a $100 US Savings Bond. A jet plane ride from **Grumman Aircraft** was also won by Paul Viebroch, the top winner.

The **"500" Squadron**—named for the annual 500-mile racing classic—is the new AFA Squadron at **Indianapolis.**

(Continued on following page)

Oklahoma's representatives at the May USAF Firepower Demonstration include Clyde Kemery, Oklahoma City Better Business Bureau; R. T. Amis, Aero Design & Engineering Co.; Hardin Masters, AFA Director; O. C. Brown, Oklahoma Publishing Co.; and N. A. Morse, President, Home State Life Insurance Co.

Douglas E. McKay is Commander and accepted the unit's charter on April 30. Other "500" officers include **George Arbuckle,** Vice Commander; **Armond Vaughn,** Secretary; and **James Catt,** Treasurer. Squadron members toured the **Allison Division of General Motors** as their first official function and were later guests at a dinner sponsored by the plant.

From across the Pacific comes word that **AFA's Oahu Squadron** is sponsoring a series of **Golden Anniversary Luncheons.** Squadron Commander **Roy Leffingwell** writes that the first luncheon, held at the Pacific Club, was a "rousing success." Honored at the May luncheon was the **USAF Air Rescue Service** with **Lt. Col. Russell E. Gray,** 2d Air Rescue Group, as guest speaker, while the July meeting will welcome **Gen. Laurence S. Kuter,** new commander of the Pacific Air Force, to Hawaii.

Douglas Corrigan, whose "inability" to read a compass in 1938 earned him the famous appellation of **"Wrong-Way Corrigan,"** was guest speaker at the May meeting of the **Orange County**

San Francisco Squadron meeting in San Mateo attracts Mike Kavanaugh, Sqdn. Commander Tom Barbour, Pete Schenk, and 4th AF ISO, Lt. Col. Brad Evans.

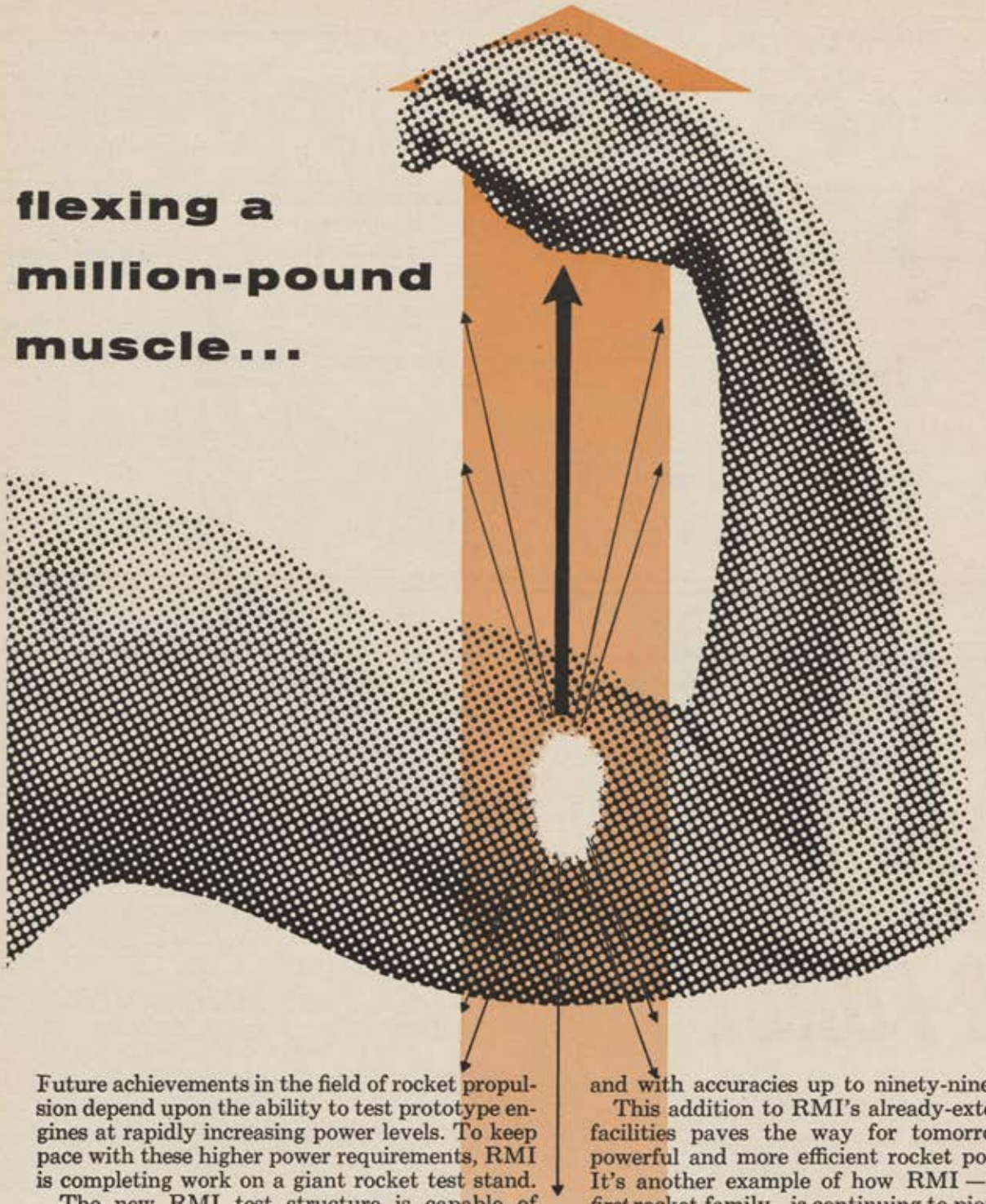
Squadron, Santa Ana, Calif. **Ed Hall,** Squadron Commander, introduced Corrigan, who earned himself a niche in history when he took off from New York in a second-hand light plane bound for Los Angeles but landed instead at Dublin, Ireland.

A banquet featuring the **Air Force Golden Anniversary** highlighted the **Louisiana Wing Convention** held at Lake Charles. Aviation pioneers **Maj. Gen. Junius Jones,** USAF (Ret.) and **Louis Gower** of New Orleans and **Orville Winover** of Baton Rouge were presented with citations by AFA Regional Vice President **Fred O. Rudesill. Clyde Hailes,** retiring Wing Commander, was in charge of the event with **Raymond E. Jones,** Lake Charles Squadron Commander, as Convention Chairman. **Dr. John K. Moore** of New Orleans was elected Wing Commander to succeed Hailes.

At Chicago's Sherman Hotel, the **Illinois Wing** held its most successful convention in several years. **Lee Cordell** was named to succeed **Bob Vaughan** as Wing Commander. **Vernon Arnt,** DuPage Squadron Commander, was Convention Chairman, with **Bob**

(Continued on page 101)

flexing a million-pound muscle...



Future achievements in the field of rocket propulsion depend upon the ability to test prototype engines at rapidly increasing power levels. To keep pace with these higher power requirements, RMI is completing work on a giant rocket test stand.

The new RMI test structure is capable of testing rocket engines in the million-pound thrust class. Its massive rotating system provides firing attitudes from vertically downward to 45 degrees above horizontal. The control center contains a maze of instruments that continuously record separate events occurring, within the engine, at intervals ranging from one-tenth of a second to less than one millisecond . . . and with accuracies up to ninety-nine per cent.

This addition to RMI's already-extensive test facilities paves the way for tomorrow's more powerful and more efficient rocket powerplants. It's another example of how RMI — America's *first* rocket family—is continuing to pioneer in the development and production of new engines for supersonic manned aircraft . . . helicopters, catapults and test sleds . . . and missiles for defense and space exploration.

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The August issue of AIR FORCE will be a once-in-a-lifetime production, celebrating the Golden Anniversary of American Airpower—about 500 pages over-all—225 text pages, lavishly illustrated—a real collector's item to be read and re-read until the paper just plain wears out.

It will feature an authentic history of the US AIR FORCE's first 50 years, prepared by outstanding professional historians and edited by the Editors of AIR FORCE Magazine—priceless material, complete with illustrations, assembled for the first time in this issue of AIR FORCE.

This is in addition to all the plus features that you'll normally find in an Anniversary Issue of AIR FORCE features that make people ask for *every* Anniversary Issue, up to ten or twelve months after publication. In August, AIR FORCE will run up-to-date command charts, identifying by name and function the top leaders of the Air Force; a complete guide to Air Force bases, with maps and background information—page after page of reference material *in addition* to the History of the US Air Force.

AIR FORCE's paid circulation is well over 60,000 for *every* issue——a bonus of more than twenty percent over the 50,000 guaranteed in the last year.

AND circulation will rocket to 80,000 or more for this special issue, at no increase in rates. It will saturate all USAF commands, design and specifications experts, the research, test, development, production, and logistics people.

Special distribution will reach airpower's top men—2,000 of them assembled in Washington for AFA's 11th Annual Convention and Airpower Panorama celebrating the USAF's Golden Anniversary . . . . for special industry briefing by the Commanders and staffs of the Air Materiel Command and the Air Research and Development Command on current research developments that will affect the course of airpower in the years ahead . . . . for an airpower symposium on "The Economics of National Defense."

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New Ute Squadron, Utah, officers are Lou Bonomo, M. J. Grover, Fay Barber, F. D. Perry, Glenn Overstake, Don Burkholder, and Selby Tanner, who is Sqdn. Commander.

John Farley, David Kurtz, and Joe Dougherty present Philadelphia Squadron citation to Bud Gurney, United Air Lines pilot who was an early flying pal of Charles Lindbergh.

Vaughan over-all supervisor. At the annual dinner, **Dr. K. Richard Johnson,** President of the National Aviation Education Council, received the Wing's Airpower Award for his outstanding efforts in behalf of aviation education. **Dr. Chalmers Sherwin,** former AF Chief Scientist and an AFA 1956 Airpower Award winner, was principal speaker at the banquet. He was introduced by **Milton Caniff,** creator of "Steve Canyon," and the 1953 winner of AFA's Arts and Letters Trophy.

The next morning, a **Great Lakes Regional Conference** was held at the hotel with Regional Vice President **Jerome Green** presiding. Representatives from **all five states** in the region took part in the discussion.

More than **600 aviation leaders** and advocates attended an AFA **Golden Anniversary Dinner** at the Los Angeles Statler Hotel in May. Co-sponsored by the **Los Angeles AFA Group** and the **Metropolitan Squadron,** the affair climaxed three days of anniversary events. **Brig. Gen. Ben I. Funk,** head of AMC's Ballistic Missiles Office, was featured speaker on the program that included a symposium on the past, present, and future of the USAF.

The **Battle Creek Squadron** was host to the 1957 **Michigan Wing Convention** with **Fred Chantrey** serving as Convention Chairman. The Michigan Airability Award, top honor bestowed annually by the Wing, went to **Dr. Talbert Abrams,** President of Abrams Instrument Corporation. Dr. Abrams was cited for his long and dedicated career in the state of Michigan.

—Gus Duda

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AFA National Convention & Airpower Panorama

WASHINGTON, D. C. ★ JULY 30-AUGUST 4, 1957

More than 2,000 persons have reserved hotel rooms for the Convention. The Sheraton-Park and Shoreham Hotels, headquarters, have been "sold out" of both rooms and suites for weeks. *Do not* request reservations at either of these hotels. Excellent accommodations are available at the other hotels. The Windsor Park, across the park from the Sheraton-Park, has a number of apartment-type suites at reasonable rates. The hotels below are listed according to distance from the Sheraton-Park. The Continental is suggested for Panorama exhibit personnel.

AFA Hotels and Room Rates

HOTEL	SINGLE	DOUBLE	TWIN
Sheraton-Park	Sold Out	Sold Out	Sold Out
Shoreham	Sold Out	Sold Out	Sold Out
Windsor Park*	$9.00	$12.00	$12.00
Dupont Plaza*	9.50	12.50	12.50
Woodner*	None	13.50	13.50
Mayflower*	9.00	14.50	16.50
Statler*	11.50	15.00	16.50
Lee House	8.50	12.00	12.00
Burlington	7.50	10.00	10.00
Ambassador	7.50	11.00	12.00
Hamilton	7.00	10.50	10.50
Continental	7.00	9.00	10.00

* *Suites available—one bedroom, $25; two bedroom, $40. Above rates are averages—lower and higher rates are available.*

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_____ (TYPE ROOM) ( ) Low ( ) Average ( ) High (DESIRED RATE)

ARRIVAL DATE & HOUR_____

DEPARTURE DATE_____

OTHERS IN ROOM_____

a weapon is born

By Quentin Reynolds

ONE bright afternoon in February 1915, four German two-seated observation planes were flying lazily over the front lines at ten thousand feet. Far below, a million men were trying desperately to kill one another, but from this height bursting shells were unheard and seen only as tiny puffs of white cotton. The muddy trenches were only dark lines irregularly crawling across the land; the war was clean and not a bit dangerous here at ten thousand feet. Occasionally some crazy Englishman would empty a rifle or a revolver at you as you flew by him, and you might return to your airdrome with three or four bullet holes in the cloth fabric of your fuselage, but that was merely something to joke about in the mess hall that night. A few British two-seated planes carried machine guns for the use of the observer. He could shoot to either side and he could shoot to the rear, but the guns were heavy and few of the planes which carried them could climb to ten thousand feet. And the guns, in addition to being inaccurate, were constantly jamming so some British pilots had abandoned them in disgust. The airplane was a flying machine, not a fighting machine, and its job was observation—nothing else.

The observers in the four German planes had seen all they wanted to see, and the leader was about to give the signal to return when a tiny speck appeared in the distance. It grew, and now the Germans could see that it was a little single-seater French plane. It headed directly for them, but they ignored it. Its propeller was spinning like a solid disk; it didn't maneuver to get above or below the German machines. They watched its approach curiously but without any apprehension, and then suddenly—impossibly—a small burst of golden flame blossomed from the end of a machine gun mounted directly in back of the propeller, and a stream of lead began to spurt from it. This burst of fire killed one German pilot, and his plane, out of control, began to spin crazily toward the ground. Then the French plane swerved a bit, and again the hail of lead came to hemstitch the fuselage of a second German plane. Bullets cut through the fuel line, and gasoline spattered over the hot engine, ignited, and the plane roared down in flames.

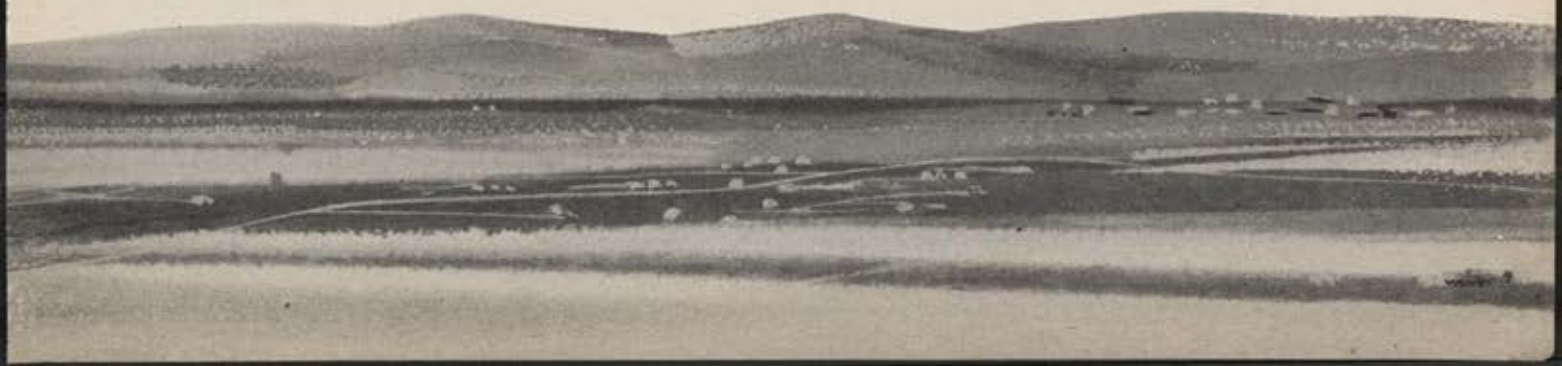
The remaining two German planes turned quickly and headed for home, the pilots white and shaken, for today they had seen something no airman had ever seen before; they had seen a gun which apparently shot its bullets directly through the whirling blades of the propeller. Back at the field their reports were received with skepticism and ridicule. The two-bladed propeller revolved twelve hundred times a minute, which meant that it passed a given point twenty-four hundred times each sixty seconds. The conventional machine gun shot six hundred bullets a minute—if this stream of bullets was aimed at the propeller, perhaps the first twenty by some miracle might miss the blades, but certainly the next few would smash the prop to splinters, and the plane and its pilot would very likely be destroyed. But it happened again the next day and the following day. The news spread all over the German air front, and the pilots were now in a state of panic. They had to revise quickly all of the established theories and practices of aerial observation. For the first time they were on the defensive. If a French pursuit plane flew directly toward them, they now fled.

During the weeks that followed it seemed probable that the revolutionary tactic was being launched by just one French plane. The pilot's method of firing from the nose of his plane, through the whirring blades of his propeller, was not a technique that as yet had been adopted by the whole Allied air force; it seemed to be the brain child of one French flyer, for most reports mentioned the same distinctive markings on the pursuit ship that was doing so much damage. But suppose the entire French and British air forces adopted this fantastic technique? It would be only a matter of days before the whole German air force was cleared from the skies, and if this happened, Allied troops and artillery could move to new positions unseen and unreported by German air reconnaissance and thus gain an overwhelming tactical ground advantage.

Then one day a French single-seater plane developed engine trouble over the front and glided to safety behind the German lines. It was routine then for all pilots landing in enemy territory to burn their planes immediately, but before the French pilot could set fire to his craft, he was grabbed by alert German infantrymen. The plane and pilot were immediately dispatched to the nearest German air base, the pilot to be wined and dined by the air-force mess, according to the custom of the day, and the plane to be examined thoroughly by experts. Some of the German pilots recognized the plane; it was the one they had been fleeing from for weeks. It had a free-firing automatic rifle mounted directly on the cockpit, pointing dead ahead toward the propeller. Closer examination showed the way it operated. The near side of each propeller blade had been fitted with a triangular steel wedge which would deflect most of the bullets that hit the blade. It was a dangerous, almost suicidal device, for a bullet striking the blade cleanly would of course smash it, and even if it deflected the bullet, it might well ricochet back to smash either a vital part of the engine or a vital human part of the pilot. Nevertheless, crude and dangerous as it was, it had been so successful that the pilot had shot down six German aircraft in three weeks, and spread near-panic through the German air force.

When the pilot ruefully gave his name, the commanding officer ordered more champagne, and the toasts to the intrepid French airman lasted far into the night. This was no ordinary pilot; this was Roland Garros, known even before the war as France's greatest stunting airman. Pilots of both sides in 1915 looked upon their air war much as the knights of King Arthur's court looked upon jousting. There were, of course, occasional and regrettable casualties, but there was nothing (except in isolated cases) personal about the killing. Fighting in the air was a gentleman's game; it could almost be compared with the tennis matches at Wimbledon or the international polo matches on Long Island. When it was over, victor and vanquished filled their glasses, toasted each other in extravagant superlatives and then the victor and his squadron would escort the vanquished to a very superior prison camp, where he would live the life of a retired and respected hero until the war was over. Roland Garros, now that the secret had been discovered, and now that the war (for him) was over, relaxed and over the cham-

(Continued on page 105)



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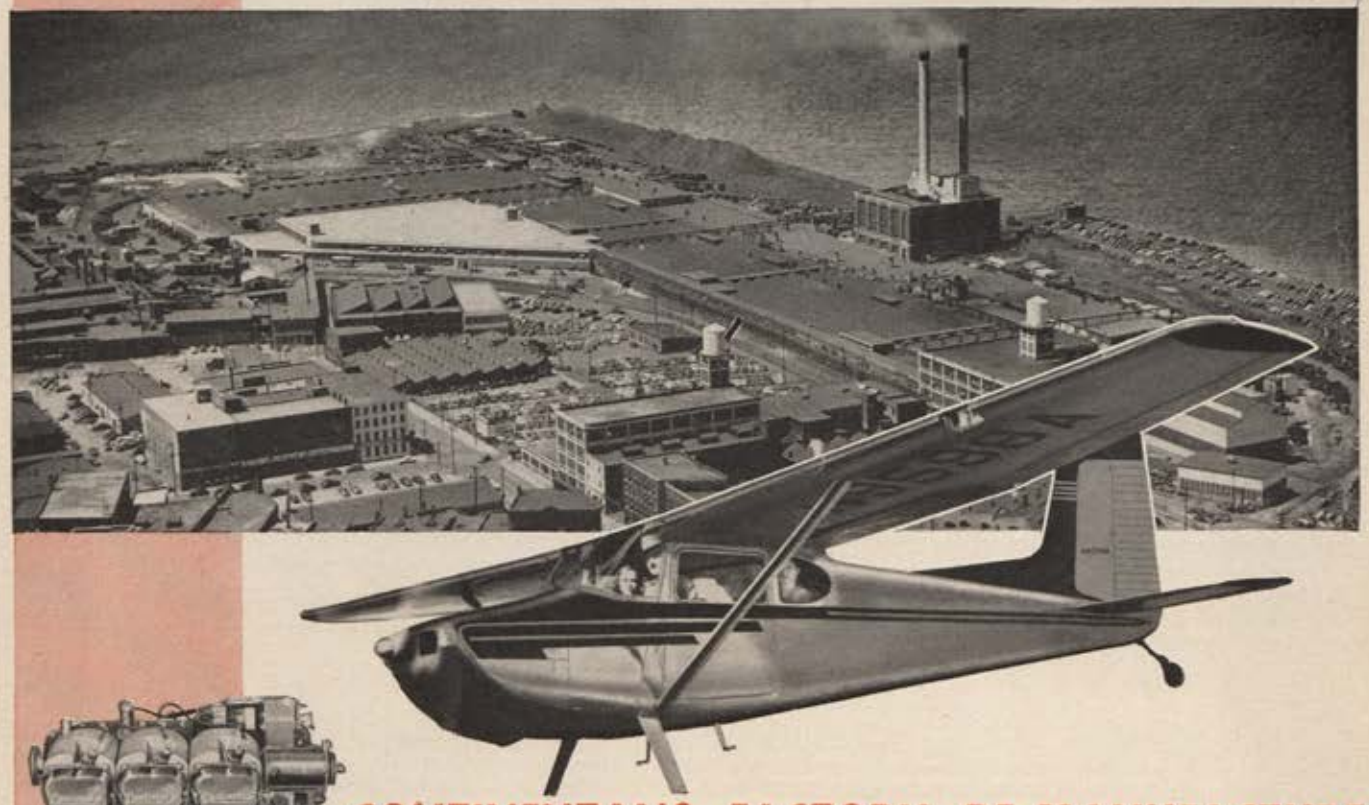

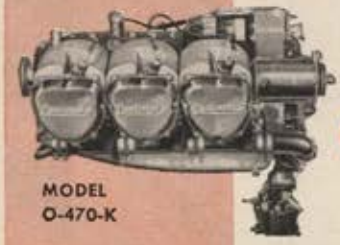

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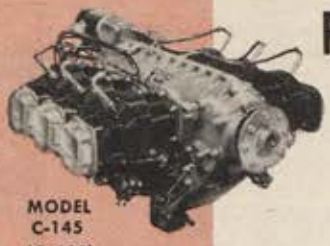

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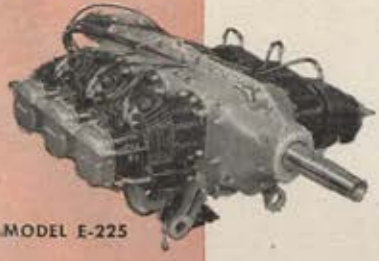

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pagne discussed aerial tactics with these affable Germans, who until an hour ago had been his enemies. The Germans respected a brave man, and this Garros was indeed a brave man; every time he pulled the trigger of his gun he was gambling that the bullets from it would not destroy him and his plane. It was the 1915 version of Russian roulette.

Were there other planes using the device? Garros smiled and said reproachfully, "You know you shouldn't ask such questions of a prisoner of war." The German colonel in charge angrily reproached the pilot who had shown such discourtesy to a guest and apologized to Garros.

But it appeared obvious to the German colonel that it was merely a matter of time before the whole Allied air forces would adopt the device, a sobering thought. He immediately phoned to Berlin to break the news to higher officers of the General Staff. They gave quick, terse orders.

Garros had made his unfortunate landing at eight a.m. on a Tuesday morning. At five that afternoon the clogged fuel line that had forced him down had been cleaned and the little Morane was flown to Berlin to be inspected by members of the General Staff and by a lean, rather short-tempered young Dutchman who had been urgently summoned from his airplane factory at Schwerin, some 220 miles north of Berlin. They examined the revolutionary device thoroughly and Colonel von Hoeppner of the Signal Corps turned to an aide and told him curtly to produce a parabellum machine gun immediately. This was the standard infantry air-cooled gun which shot a continuous band of one hundred bullets. While the aide ran to a nearby hangar to get the gun, Hoeppner gave the Dutchman some orders.

"Within a few days or within a week," he said, "the French and British may have a hundred planes in the air using this gun. Hurry back to Schwerin, copy this method of shooting through a propeller, and equip as many pursuit planes as you have with it. I want this within forty-eight hours."

The aide was now on hand with the machine gun. He handed it to the Dutchman, who held the unfamiliar object in his hand almost helplessly. He was twenty-five now, and although he was recognized as one of the greatest of all aircraft designers, he had never shot a machine gun in his life.

Heavy weather descended over the airport as darkness came, and the little Dutchman was hurried to the Friedrichstrasse Bahnhof to catch a train to Schwerin. With him was the machine gun and the propeller from Garros's plane. He was given a drawing room to himself, and as the train hurled through the night, following the Elbe River, he considered the assignment—a strange one to be given a noncombatant who didn't much care who won the war, but a provocative and flattering challenge to a practical engineer.

He took the gun apart to familiarize himself with its most intimate secrets. He opened his briefcase, took out a pad and pencil, and began to make some calculations.

An unsummoned and incongruous childhood memory welled out of the deep recesses of his subconscious mind. Walking home from school, he and his schoolmates always passed the huge, creaking windmills that dotted the countryside outside of his native Haarlem. Invariably they would stop, pick up stones from the road, and throw them at the turning wooden blades. Strangely enough, it wasn't easy to hit the broad blades even though they moved slowly. As often as not the stones went right through the blades without touching them. The train roared by Rossov, passed Ludwigslust, stopped briefly at Hamburg, and then went on to the district called Mecklenburg. When it reached Schwerin, the Dutchman thought that possibly, just possibly, he might have found the answer.

He had been born Anthony Herman Gerard Fokker, the son of a Dutch tea planter who had made a fortune in Java and had then returned with his family to spend a life of slippered ease in Haarlem, a small city on the north coast between Amsterdam and the dunes bordering the North Sea. When he was sixteen, he built his first plane in the kitchen of his Dutch home. When he was twenty, he constructed what he felt to be the fastest, most stable little monoplane in the world. Proudly he exhibited it to the military authorities of his own country, but Holland was buying planes from experienced English firms, not from young visionaries with no engineering education and with no experience. He tried unsuccessfully to peddle it in Russia, in France, and in England. Finally he made an exhibition tour in Germany, and when he became the first man in the country to loop the loop, he was hailed as The Flying Dutchman, and Germany made a national hero out of the young pilot-designer. And in 1913 the German Signal Corps ordered him to manufacture a dozen planes to be used for scouting and observation.

His eyes were so concentrated upon his drawing board in the German-built factory at Schwerin that they never saw the war cloud overhead. His ears were so attuned to the roar of the eighty-horsepower Argus engine which powered his little plane that they heard neither the rumble of destiny nor the gun caissons rolling toward the French border. If the major powers were getting themselves involved in a war, he felt that as a neutral Dutchman it was no affair of his. But the day that war broke out, high military officials rushed to Schwerin to tell Fokker to build as many planes as he could. To begin with, the Signal Corps wanted twenty-four single-seater sport planes which could be used for observation.

"You must hurry these," the men from Berlin said. "The war will be over in three months, and we want a chance to demonstrate how much better planes can do the job of observation than the balloons we use now."

The war wasn't over in three months, but within that short space of time the politically naive but mechanically mature Dutchman had made a reputation as the finest aircraft designer in Germany. Pilots respected him not only because he gave them planes which during most of the war were infinitely superior to those flown by the enemy, but because he, too, was a pilot and a better one than most of them. Tony Fokker met every challenge the German High Command threw at him. And then in

(Continued on following page)

ABOUT THIS ARTICLE

This article is a chapter from a new book by Quentin Reynolds, called They Fought for the Sky, *published last month by Rinehart & Co., Inc. Mr. Reynolds, who is one of the nation's foremost story-tellers and renowned as a war correspondent, is the author of a number of other books, among them* The Amazing Mr. Doolittle. *A review of* They Fought for the Sky *is in "Airman's Bookshelf," on page 21 of this issue.*

1915, within the short space of forty-eight hours, this Hollander, who resisted every attempt on the part of the Germans to make him a naturalized citizen of their country, almost changed the tide of war for them.

It was midnight when the train pulled into Schwerin. Reinold Platz, an imaginative welder, had made Fokker's first steel-tube fuselage in 1912 and was now in charge of his experimental department. Heinrich Luebbe had been a barnstorming pilot with Tony Fokker, but he was always experimenting with machine guns and now he was in charge of production at the Schwerin plant. Bernard de Waal, a boyhood friend, was his chief test pilot. They were waiting for him at the station, alerted by a message he had sent before boarding the train at Berlin.

As their car rushed them to the Fokker Flugzeugwerke, a combined factory and airfield outside the city, he told them of what had transpired. Not one of these men had ever gone to an engineering school, but each was a brilliant mechanic and to them this was a mechanical rather than an engineering problem. They made thoughtful suggestions; Fokker listened or shook his head sharply. When they reached the plant, they knew what they had to do.

First they anchored the gun and shot several hundred rounds to judge its rate of fire accurately. They attached the Garros propeller to an engine and checked its revolutions. Dawn crept over the field and into the hangar, but beyond giving orders to bring coffee, neither Fokker nor his assistants took notice of the time. Within two hours Fokker had completely rejected Garros's desperately brave but unpredictable method of avoiding the propeller blades; the vibration alone, caused by the deflection of the bullets, would in time shake the engine loose from its moorings.

Fokker immediately saw that the only practical method of firing without smashing the blades was to have the propeller itself shoot the gun. He hurried to his drawing board to work out this simple principle in practical terms. Within two hours he had the basic answer. It looked fine, in the spidery white lines that crawled across the blue paper, but would it work? He hurriedly attached a small knob to the propeller which struck a cam when it revolved. The cam was attached by strong wire to the hammer of the machine gun. He loaded the gun and slowly revolved the propeller by hand. The gun actually shot bullets between the blades. He had the basic problem licked, but now he had to establish some sort of liaison between pilot and propeller. The pilot, after all, had to control the shooting. He worked on it for another few hours, and then he felt ready to demonstrate it. Exactly forty-eight hours had passed since the challenge had been tossed to him; now that it was over he was too excited to grab any sleep. He phoned Berlin and asked that representatives of the General Staff be on hand the next morning.

It was only long after the war that Fokker learned that the solution to the problem of firing through a propeller had in theory been solved in 1910 by August Euler, but although Euler had patented his device, he never quite developed it to the point where it was practical. Besides, no one then was interested in aerial warfare; airplanes, if they were to be of any military use at all, would be restricted to scouting and observation. Just before the war began, Georges Constantinesco of Romania had the problem almost licked, but again he hadn't perfected a way to use it in a practical sense. Sopwith in England and Browning in the United States had been working on an electrical synchronizing system, but none of these engineers was able to do what the young Dutch mechanic accomplished in a mere forty-eight hours. Fokker was never anything but an inspired mechanic, but his inspiration amounted to sheer genius.

That night he installed the device in one of his Fokker Eindecker Scouts (the E-1). This was the plane used so extensively during the early period of the war. Its eighty-horsepower Oberursal rotary motor gave it a maximum speed of eighty miles an hour at six thousand feet. When he was satisfied that gun and propeller were working perfectly, he locked the little monoplane in a hangar and took a nap.

A dozen high-ranking air force and General Staff officers were on hand the next day. They looked with disappointment at the propeller blades; there were no steel wedges protecting the thin wooden props as there had been on Garros's plane.

Fokker first demonstrated the machine gun from the ground, starting the engine and firing through the propeller toward the rifle butts at the end of the field. He shot three bursts of ten shots each before stopping the engine. The officials looked interested but puzzled; certainly none of them realized that what they were watching meant that a completely revolutionary era of aerial warfare was about to dawn. They examined the blades and found them undamaged. One of them, apparently suspecting a trick by this young wizard, suggested that although the Fokker scheme seemed all right if you shot a burst of ten bullets, how would it work if the pilot shot the whole band of a hundred bullets? Fokker shrugged his shoulders and proceeded to fire bursts of one hundred, and now the observers were satisfied that his scheme worked—while the plane was on the ground. But would it work in the air?

Impatient at the conservative and skeptical attitude of the group and a little annoyed that not one of the observers had congratulated him on performing an engineering miracle in so little time, Fokker decided to give them a bit of a scare. He directed his workmen to place some old wings on the ground near the end of the field and told the observers to watch closely to see if he could really hit the target from the air. As he took off, he saw that they had gathered close to the wings. He went up to a thousand feet, nosed over, pointed the plane at the ground target, and began to fire. He knew that the ground beneath the wings was hard rock. The bullets streamed through the frail cloth texture of the wings and, hitting the rock beneath, ricocheted in every direction. The dignified observers scattered wildly, some running for the safety of the nearby hangar. Fokker landed, and the observers, recovering from their panic, walked timidly toward the wings, which were completely riddled. They examined the propeller blades, which had not even been nicked. Then they consulted among themselves and gave their verdict.

"There is only one sure way to test this gun," their spokesman told Fokker. "Take it to the front, teach a pilot how to use it and then let him go up and shoot down an enemy plane. This will prove that the gun works in combat."

Fokker's protests fell on deaf ears, and within twenty-four hours he found himself at the front, at the headquarters of General von Heeringen, near Laon not far from Verdun. The general, who had been alerted to the arrival of Fokker, said that the Crown Prince had been informed of Fokker's experiment and he would like to see it in action. The next day the Crown Prince, clad in the smart white blouse, slim breeches, and highly

(Continued on page 109)

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polished boots of the Hussars, arrived to be introduced to Fokker. He towered over the small Dutchman, who as usual was dressed in the nondescript clothes of the civilian pilot—checkered, unpressed, black and white breeches, wrap puttees, worn tweed coat with a pair of goggles hanging from a pocket, and a tight-fitting woolen flying helmet.

"Kaiserliche Hoheit," General von Heeringen said stiffly, "this is Herr Fokker, inventor of our fighting plane."

The Crown Prince blinked in amazement at the strangely dressed, beardless youth in front of him. "Surely it was your father who invented the fighting plane, not you?"

"My father is raising tulips in Holland," Fokker said dryly.

He showed the amiable son of the Kaiser his simple mechanism and then demonstrated it for him. When he landed, the Crown Prince congratulated him but said ruefully that he still couldn't understand how the bullets could stream through the whirling blades without ever hitting the propeller.

"Try to explain in simple layman's language," he asked.

"First of all," Fokker said, groping for an easily understood analogy, "the gun can fire through the space between the revolving blades safely, only because the speed of the bullets is so much greater than the speed of the blades. As kids in Holland we used to throw stones between the big blades of the windmills. They revolved quite slowly—about ten times a minute. We threw our stones swiftly and it was easy to throw them between the blades."

A few days later incredible orders came from Berlin to the effect that Fokker should take up his plane and himself prove the capability of the synchronized gun by shooting down a French or British aircraft. In vain Fokker protested that he was a "neutral." His argument fell on deaf ears. A German uniform was put on him and an identification card stuck in his gray field-tunic pocket, stating that he was Lieutenant Anthony Fokker of the German air force. Now, if forced to land behind Allied lines, he would not be shot as a spy but treated as a prisoner of war.

Before he could protest further he was in the air, a reluctant fighter looking for enemy prey. At six thousand feet he saw a Farman two-seater observation plane ambling out of a cloud. Now he could prove the worth of his gun. He nosed over and dove at the plane. Fokker wrote afterwards:

This plane had no reason to fear me. I was going straight for it, my nose aimed at it, and they couldn't possibly have any reason to fear bullets fired through my propeller.

While approaching, I thought of what a deadly accurate stream of lead I could send into the plane. It would be just like shooting a sitting rabbit because the pilot couldn't shoot back through his propeller at me.

As the distance between us narrowed, the plane grew larger in my sights. My imagination could vision my shots puncturing the gasoline tanks in front of the engine. The tank would catch fire. Even if my bullets failed to kill the pilot and observer, the ship would fall down in flames. I had my finger on the trigger. . . . I had no personal animosity towards the French. I was flying merely to prove that a certain mechanism I had invented would work. By this time I was near enough to open fire, and the French pilots were watching me curiously. . . . In another instant, it would be all over for them.

Suddenly, I decided that the whole job could go to hell. It was too much like "cold meat" to suit me. I had no stomach for the whole business, nor had I any wish to kill Frenchmen for Germans. Let them do their own killing!

Returning quickly to the Douai flying field, I informed the commander of the field that I was through flying over the front. After a brief argument, it was agreed that a regular German pilot would take up the plane. Lt. Oswald Boelcke, later to be the first German ace, was assigned to the job. The next morning I showed him how to manipulate the machine gun while flying the plane, watched him take off for the front, and left for Berlin.

Fokker arrived in Berlin to receive a message that Boelcke had brought down an Allied plane using the synchronized gun. A day later Lt. Max Immelmann, who was also on his way to becoming one of the early aces of the German air force, duplicated the feat, and now every flight leader at the front was calling for the synchronized gun. Fokker hurried to Schwerin to turn them out as quickly as possible. During the following weeks the French and British flyers were helpless. Their losses were enormous, and there was nothing they could do about it. They tried to adopt Garros's tactics but soon discovered what Fokker had suspected on his first inspection of the steel-edged props—when the bullets were deflected a terrific vibration invariably followed, often making the plane unmanageable. And constant pounding by the bullets weakened and smashed propeller blades, sending the planes plummeting down to destruction.

For a time the air was almost cleared of Allied planes. Now the German infantry could move huge masses of troops without fear of detection by Allied air observers, and of course the German flyers could spot any significant movement of Allied troops and artillery. A surge of confidence swept not only over the German airmen but over the troops and public as well. If the skies could—as it appeared—belong to Germany and Germany alone, it might mean the decisive turning point in the war. When General Staff officers congratulated Fokker and enthusiastically (if prematurely) gave him credit for winning the war, he merely shrugged his shoulders. He wasn't interested in winning the war for the Germans; he was only interested in turning out faster, safer, more maneuverable and more durable airplanes. His dreams were never troubled by the fact that Allied airmen were dying because of the superiority of his planes and his synchronized gun.

Fokker's gun was considered to be so important that pilots using it were forbidden to fly over Allied territory lest the secret fall into enemy hands. But four months after Boelcke had used the gun with such telling effect, a German pilot lost in a fog landed behind the French lines. Before he could set fire to his plane he was captured and the plane hurriedly flown to Paris, where experts analyzed and quickly mastered the secret of the havoc-wrecking gun. British and French engineers combined the Fokker device with a gun gear invented by Constantinesco. This latter did not rely entirely upon mechanical gear but on hydraulic oil pressure operating on the principle of the automobile brake. A few weeks of feverish work and it was ready, and the war in the air, which Tony Fokker, a neutral, had almost won for the Germans, now once more resolved itself into a bitter, fairly even struggle.

But all this happened in 1915.—END

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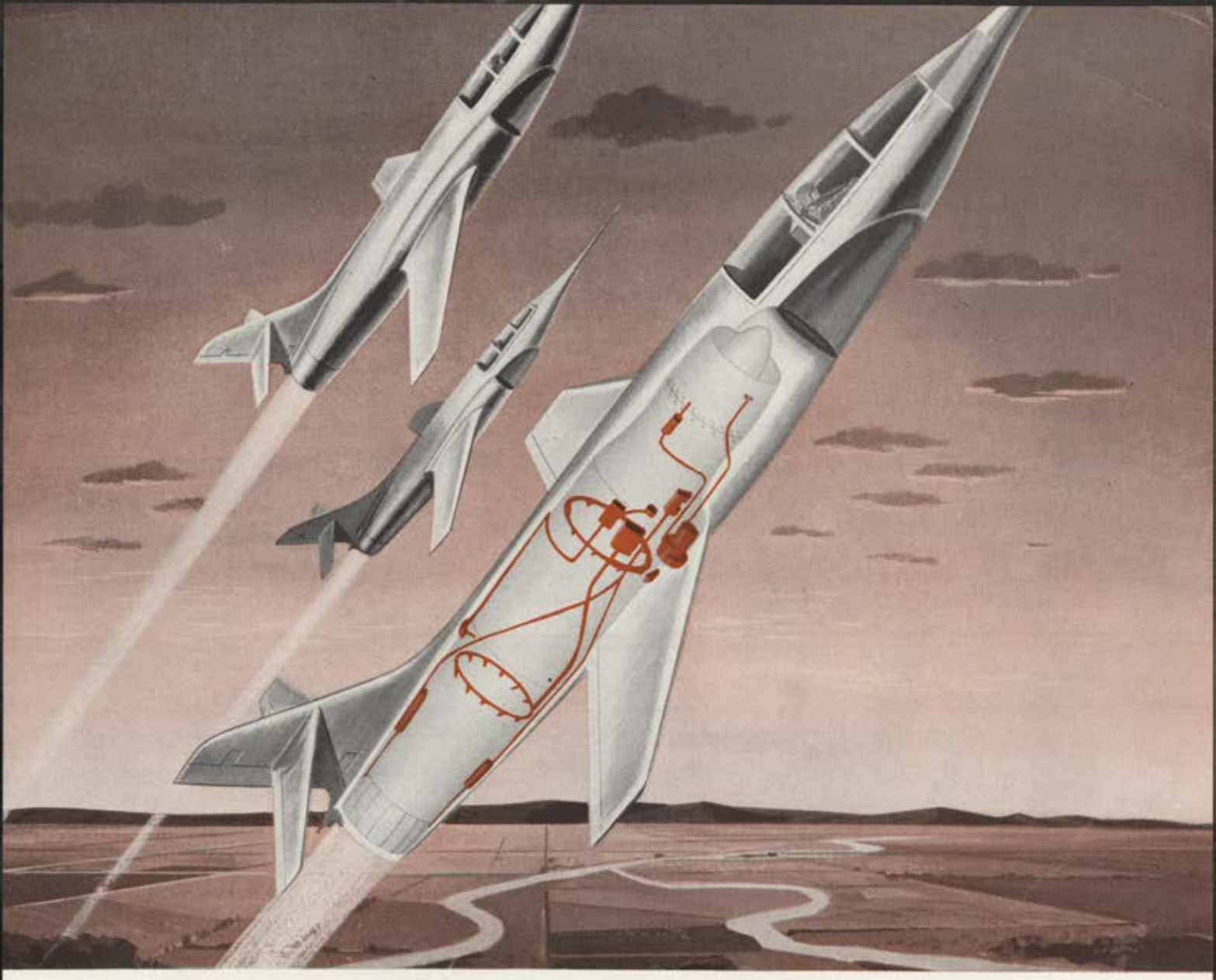

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