THE TRUTH ABOUT OUR FUTURE AIR DEFENSE

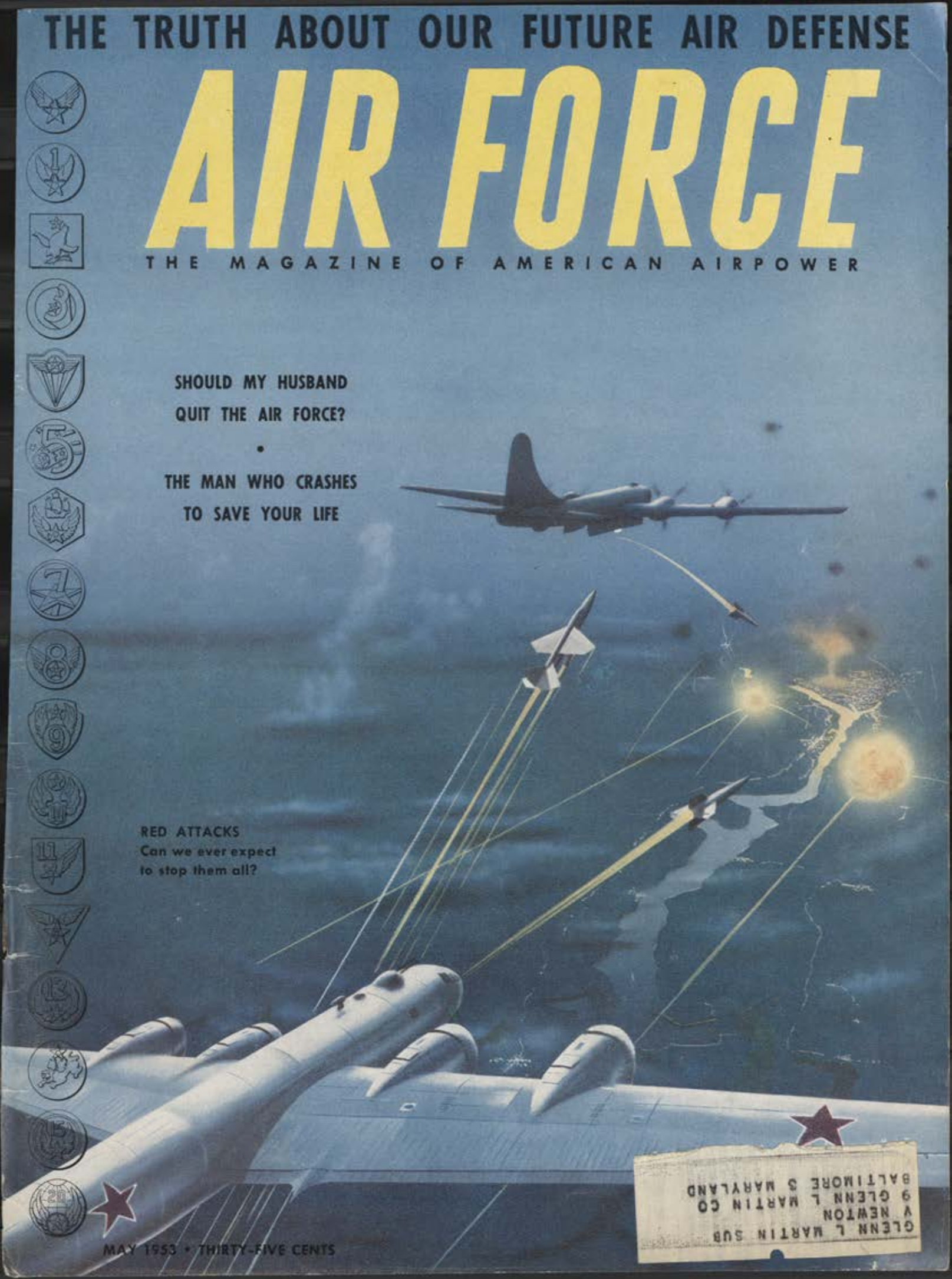
AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

SHOULD MY HUSBAND
QUIT THE AIR FORCE?

•

THE MAN WHO CRASHES
TO SAVE YOUR LIFE



RED ATTACKS
Can we ever expect
to stop them all?

MAY 1953 • THIRTY-FIVE CENTS

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

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

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

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

ARMA ADVANCED ELECTRONICS FOR CONTROL

TIME WAS when aircraft had no brakes. In those days, planes were light and slow enough to stop themselves before they "ran out of runway."

But as ships grew larger and faster, the problem of reducing the landing or ground run of aircraft became a threat to aviation's progress.

"Sprags" or claws were added to the tail skids, but these dug up the runways. Air brakes were found to be ineffectual at low speeds; automobile-type band brakes were too heavy and cumbersome. Ground loops and crack-ups were common.

GOODYEAR AVIATION PRODUCTS

50th ANNIVERSARY AVIATION GOODYEAR ONE OF THE PIONEERS

NOW the world's largest and fastest aircraft land safely on standard-length runways, thanks to Goodyear Disc Brakes which are used today on all types of airplanes.

This amazingly compact and powerful braking system operates hydraulically and offers a velvety-smooth, nonbinding, nonfading action—effectively packed into a minimum of space.

This is an example of but one of many Goodyear Aviation Products which are serving aviation today. Goodyear has been contributing to aviation progress since 1909.

Goodyear, Aviation Products Division
Akron 16, Ohio or Los Angeles 54, California

MORE AIRCRAFT LAND ON GOODYEAR TIRES, TUBES, WHEELS AND BRAKES THAN ON ANY OTHER KIND

We think you'll like "THE GREATEST STORY EVER TOLD"—every Sunday—ABC Radio Network—THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

WHO PUTS THE *Air*

Putting air to work *inside* aircraft is a Stratos specialty. Stratos designed and manufactured pneumatic equipment is serving vital functions in many military and commercial aircraft. Whether it be the pressurizing and air conditioning of a modern transport, cooling the cockpit of a sonic fighter or operating indispensable accessories in a jet bomber, Stratos precision-engineered equipment meets the requirement. Stratos pressurization and cabin air conditioning systems are used by leading domestic and international airlines. Stratos air-cycle refrigeration units cool the fastest Air Force and Navy jet fighters and bombers. Light-weight Stratos air-turbine drives provide dependable power for accessories in jet night fighters and bombers.

STRATOS

TYPICAL *STRATOS* PRODUCTS

NUR12
Air Flow 10 to 14 lbs/min

NUR15
Air Flow 14 to 18 lbs/min

NUR20
Air Flow 16 to 26 lbs/min

TP15-2
Air Turbine Drive
For Driving 9kva Alternators

CFT25-3
Mass Flow and Temperature
Control Valve

NUR60
Air Flow Range
40 to 100 lbs/min

NUR30
Air Flow 25 to 40 lbs/min

IN AIRCRAFT

MS60
Air Moisture Separator
Rated Flow 60 lbs/min
Others: Rated Flow 20
and 35 lbs/min

BUR20
Air Cycle Refrigeration Package
For use with S20
Cabin Supercharger

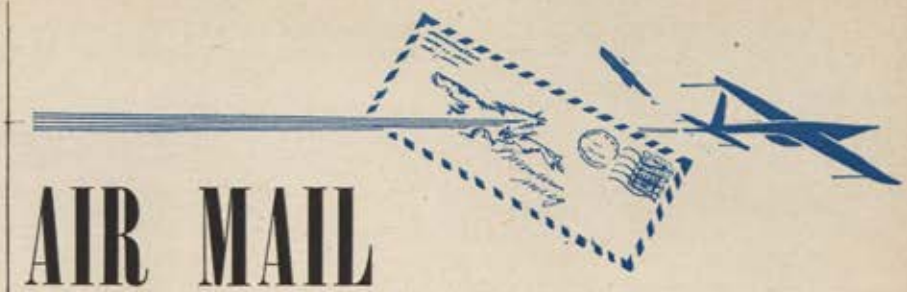
S20
Cabin Supercharger
Nominal Air Flow to 30 lbs/min

B60
Air Cycle Refrigeration Unit
For use with S60
Cabin Supercharger

S60
Cabin-Supercharger
Nominal Air Flow to 78 lbs/min

A DIVISION OF FAIRCHILD ENGINE & AIRPLANE CORPORATION

Main Office and Plant: Bay Shore, Long Island, N.Y. • West Coast Office: 1355 Westwood Blvd., Los Angeles 24, Calif.



AIR MAIL

ANGuard

Gentlemen: I have read with much interest Col. Millikan's article "The Air Guard's Coming Back." The content of the article, the timeliness and the manner in which it was edited by the staff of AIR FORCE were most impressive. I am sure the article will be most informative to all organizations of the USAF Reserve components.

Maj. Gen. Earl T. Ricks
Acting Chief, National Guard Bureau
Washington, D. C.

Gentlemen: . . . It seems to me that the article presents a very fine exposition of the past accomplishments and the present endeavors of the Air National Guard as a major component of the USAF. I am pleased that you have seen fit to publish this article in your magazine, where it will reach readers who obviously have an active interest in the Air Forces and who, in too many instances, otherwise may lack an understanding of the very real problems confronting us in again building "almost from scratch."

Maj. Gen. E. A. Walsh, NG-Ret.
President
NG Assn. of the US
Washington, D. C.

Gentlemen: We have read Colonel Millikan's article in your March issue with deep interest. He has reflected some deep and poignant thoughts on the high value of the ANGUS, and it is extremely encouraging to see the Air Guard story told in such an intelligent manner.

Lt. Col. John H. Neilson, ORNG
Office of The Adjutant General
Salem, Ore.

Dig This!

Gentlemen: Your magazine AIR FORCE, it is swell!!! In fact, it is quite invaluable to me in my new situation, AFROTC. (I'm a veteran of Uncle Sugar's dogface musicians just returned to college.) The magazine really helps me get caught up on a lot of things I missed, but good. Jeez! The last time I remember anything much about airplanes, they were good old P-38s and B-17s. Buddy, you can imagine my hopeless feeling to get into class with F-86Ds and B-36s. Wowee!! But, thanks to your all-round stuff, I was able to fling that stuff around as if I'd always known it.

This all leads up to the obvious: I wanna join the AFA. Think I come under the "Cadet" category, as I'm in Air Science III and was given a real nice blue uniform with two real jazzy shirts, regulation too!

Enclosed somewhere please find a check for the first year's membership, that includes this fabulous magazine AIR FORCE.

Hurry a little on that mag delivery 'cause I sure use that little old publication.

George W. Black
State College, Pa.

• *Thanks for the crazy letter, man! It's real george, George.*—The Editors.

Reference Correction

Gentlemen: Your articles serve as a basis for many discussions in our VARTU Training Assemblies. Such an article as that of Lt. Col. Hammer's, "No School —No Promotion," (March issue) is deserving of considerable thought and discussion at levels much higher than VARTU Flights, Squadrons and Groups. It has been proven in our own units that men, once they are enrolled in the USAF Extension Course Program, become more interested Reservists and more active in all respects. We need promotions in the Reserve but we also need a Reserve that is at least basically educated along the lines of our ever changing global Air Force and not the Air Force of 1945-46. In short, education of the correspondence course level should be as much a requirement as time in grade.

I wish to take issue with you con-

AIR FORCE Magazine is published monthly by the Air Force Association. Printed in U.S.A. Re-entered as second class matter, December 11, 1947, at the post office at Dayton, Ohio, under the act of March 3, 1879. **EDITORIAL CORRESPONDENCE AND SUBSCRIPTIONS** should be addressed to Air Force Association, 1424 K St., NW, Washington 5, D. C. Telephone, Sterling 3-2305. Publisher assumes no responsibility for unsolicited material. **CHANGE OF ADDRESS:** Send old address *and* new address (with zone number, if any) to 1424 K St., NW, Washington 5, D. C. Allow six weeks for change of address. **SUBSCRIPTION RATES:** $4.00 per year, $5.00 per year foreign. Single copy, 35 cents. Association membership includes one-year subscription: $5.00 per year (Cadet, Service, and Associate membership also available). **ADVERTISING CORRESPONDENCE** should be addressed to Sanford A. Wolf, Advertising Director, 114 East 40th St., New York 16, N. Y. (MUrray Hill 9-3817.) Midwest office: Urben Farley & Company, 120 S. LaSalle St., Chicago 3, Ill. (Financial 6-3074). Pacific Coast offices: Keenan, Hunter & Dietrich, 638 S. Van Ness Ave., Los Angeles 4, Calif. (Dunkirk 2-8458); 235 Montgomery St., San Francisco 5, Calif. (Douglas 2-1323.)

cerning Mobilization News in your March issue. Being personally interested in your notice of AF-ROTC, it required some research on the part of our VART Liaison Airman, S/Sgt. Best, to find that your reference was to AF Reg. 35-56 and not 35-26 as listed. Next, "four years of active duty in an indefinite Reserve appointment" is a bit confusing. You should have covered the reference to "Selection Date." In any case, your news item interested me enough to cause me to investigate and that, after all, is the purpose of such information.

Your errors as well as type-setting mistakes are few and our support will continue, regardless.

Capt. Newel T. Henretty, AFRes
Deputy Commander
9307th VARTU Sqdn.
Bradford, Pa.

• *We certainly missed on that one. AF Reg. 35-56 is the proper reference. Misinterpretation of the word "indefinite" and confusing "appointment" with "assignment" are causing many officers to turn thumbs down on the indefinite Reserve commissions currently being offered by USAF. Actually, the indefinite appointment has nothing to do with active duty. It just extends your present five-year appointment until you qualify for retirement, if you wish to keep it that long. The article "Has Your Postman Rung Twice?" in our April issue is intended to help clarify the point.* —The Editors.

No Smoky City

Gentlemen: Oh! What you said! Yes, you did! On page 68 of the March issue of AIR FORCE you referred to Pittsburgh as the "Smoky City"! Heads have been lopped off for lesser offenses!

The people of Pittsburgh have spent millions of dollars in cleaning up and beautifying their city. The job still isn't complete, but this is to inform you, gentlemen, that Pittsburgh is *no longer* the "Smoky City"!

Not being a native Pennsylvanian, I, too, often referred to this city as "you-know-what." But, in all fairness, Pittsburgh has now become the "Fair City."

If you don't believe it, drop by on June 19, 20, and 21 for the Pennsylvania Wing Convention and see for yourselves.

Kathleen C. Murray, Pres.
Greater Pittsburgh Auxiliary, AFA
Pittsburgh, Pa.

"Target: Mom"

Gentlemen: My husband, Capt. Arthur Heise, has been a member of AFA for some time now. Because of this I am renewing for the coming year. Capt. Heise has been missing in action over North Korea since January 29 of this year.

I enjoyed your article "Target: Mom" in the February issue because it is quite probable that my husband may be a prisoner. It was most interesting, and I will look forward to any other such information that you may publish.

Mrs. Arthur Heise
Bossier City, La.

RENDEZVOUS

Where the Gang gets together

TWO FOR THE 15TH: I'm seeking information about a publication entitled "The Tower." This booklet was published by the men of the 464th Bomb Grp., 5th Bomb Wing, 15th AF, stationed in Italy during World War II. It first came to my attention in an article in "The Saturday Evening Post." *William J. Geary, Jr., 136 Franklin St., Westerly, R. I.*

I would like to know the names of any books published on the 15th AF during World War II. *William H. Griffin, 820 N. 30th Street, Waco, Tex.*

AND TWO FOR THE 466TH: I am interested in compiling information on the 466th Bomb Grp., 8th AF, for possible publication. Has any historical account been written by former members of the group? *Claude V. Meconis, Advertising Manager, The Rapids-Standard Company, Inc., Rapistan Building, Grand Rapids 2, Mich.*

Where can I get a history book of the 466th Bomb Grp., 8th AF? *James R. Carey, Jr., P. O. Box 286, Ossian, Iowa.*

AIR SERVICE COMMAND, 5TH AF: Any good leads on where the following men can be located? Maj. C. V. McCartey (or MacCartney); Capt. T. F. Shaw, Jr.; Capt. (?) Gardiner; R. B. Fedoseyeff (grade or rank unknown); and Louden (first name, grade or rank unknown). They were in Air Service Command units attached to the 5th AF during the early stages of the war. *Samuel E. Gates, Debevoise, Plimpton & McLean, 20 Exchange Pl., New York 5, N. Y.*

"SOUTHERN CROSS" CREW: Does anyone know the whereabouts of James W. Warner, radio operator, and Harry W. Lyon, navigator? They were the two Americans who accompanied Sir Charles Kingsford-Smith on the flight from Los Angeles to Hawaii, the Fiji Islands and Australia in 1928 in the tri-motored "Southern Cross." AIR FORCE *Magazine, 1424 K St., N. W., Washington 5, D. C.*

CHECKERTAIL CLAN: All former members of the 325th Fighter Grp. (317, 318, 319, and Hdqs. Sqdns.) "Checkertails," not receiving clan bulletins about our 11th Annual Reunion (July 31-Aug. 1 & 2) please contact me. Particularly anxious to hear from those who trained with the group at Hillsgrove, R. I., and pilots who served in Tunisian, Pantalerian, and Sardinian campaigns. *J. Sidney Wolf, 3401 Broad Branch Terrace, N. W., Washington, D. C.*

NEEDS AFFIDAVITS: I must locate friends of mine who served with the 1st and 2d Ranger Battalions, or the 2013th Ordnance Battalion (Maintenance, 8th AF) in the years 1944-46. I urgently need affidavits from several of these men. *Sean Kevin Neilland, c/o Whitney, 40 Willow Ave., Hempstead, L. I., N. Y.*

CECIL F. RENO: I'd like to contact Cecil F. Reno, an AF captain and former master sergeant with over thirty years' service. Last stations we were together were Stuttgart, Ark., and Lockbourne AFB, Ohio, shortly before he was commissioned captain. *Felix A. Doré, 164 Powell St., Ashville, Ohio.*

LOST BUDDY: It is important for me to find M/Sgt. John P. Clanton. Last time I saw him was in Anchorage, Alaska, between 1947 and 1949. *Sgt. Scott Clayton, 3 Beakes St., Apt. A-1, Trenton 8, N. J.*

STALAG LUFT III REUNION: The seventh annual reunion of Stalag Luft III was held at the Van Cleve Hotel in Dayton, Ohio. It is always held on the Saturday closest to April 29, which is the day the men were liberated by a Task Force from General Patton's Army. Those interested in getting on the mailing list to receive notices of future reunions should write *Col. M. F. McNickle, Air War College, Maxwell AFB, Montgomery, Ala.*, or *David Pollak, The Pollak Steel Company, Marion, Ohio.*

ALL YOU CATERPILLARS: Any person who has saved his (or her) life as a result of a forced parachute jump during an emergency is qualified for membership in the famous Caterpillar Club. Eligibles wishing application blanks should write *The Caterpillar Club, Box 1328, Trenton, N. J.*

To insure appearance in a given issue, Rendezvous items should be in this office approximately six weeks prior to publication. For example, copy for June issue should be in our hands by April 15.—The Editors

when they buy aviation supplies and materials from Air Associates because—

- They can reduce inventories of standard parts and supplies.
- Numerous parts needed from many suppliers are covered by *one* order . . . *one* delivery . . . *one* bill . . . *one* payment.
- Deliveries are made to subcontractors' plants from convenient locations.

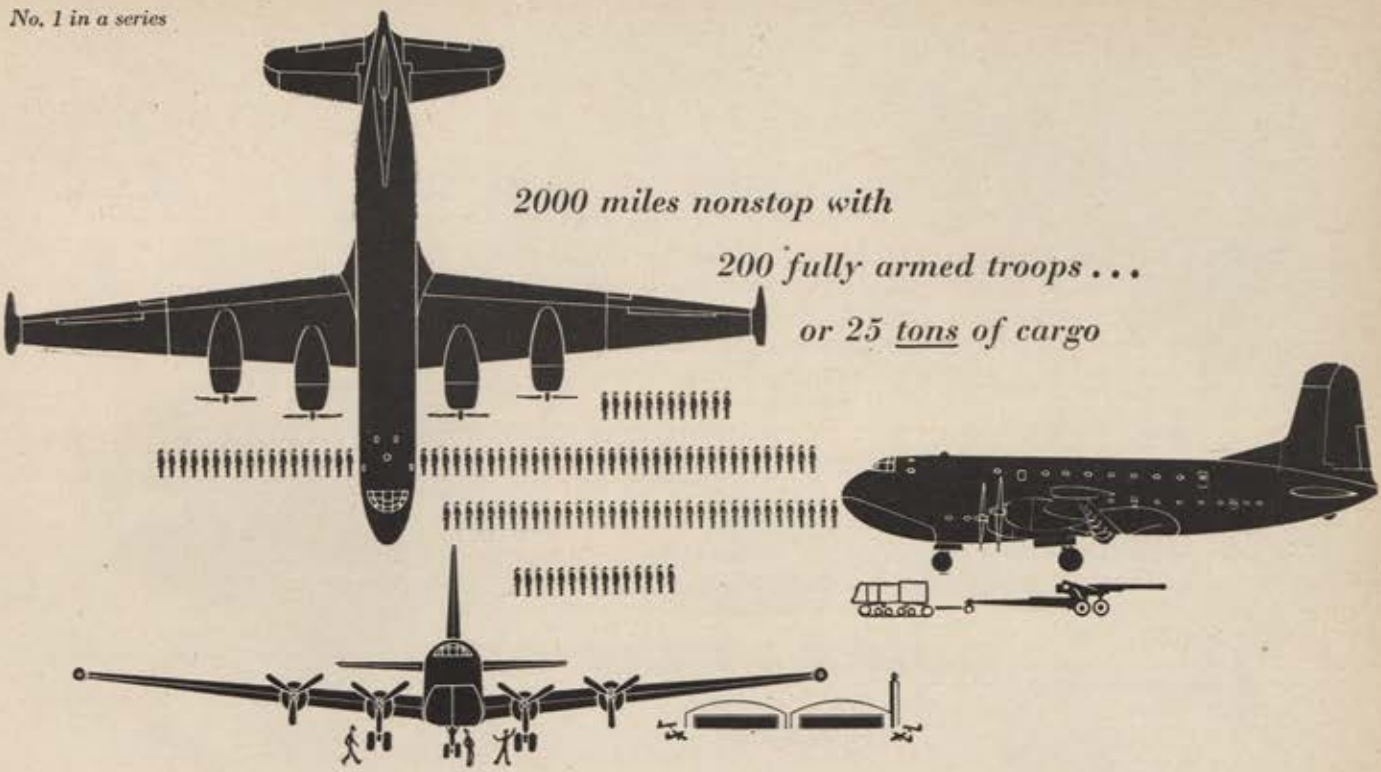
These Aviation Supplies Divisions of Air Associates are backed by 25 years of experience in meeting the requirements of the aviation industry:

EASTERN — 216 Union Street, Hackensack, New Jersey
MIDWEST — 5315 West 63rd Street, Chicago 38, Illinois
SOUTHWEST — 3214 Love Field Drive, Dallas 9, Texas
WEST COAST — 1231 Air Way, Glendale 1, California
SOUTHEAST — International Airport, Miami 48, Florida

Manufacturers and Distributors of Aviation Materials and Equipment

AIR ASSOCIATES, INC.

No. 1 in a series



2000 miles nonstop with

200 fully armed troops . . .

or 25 tons of cargo

—the Douglas C-124 Globemaster!

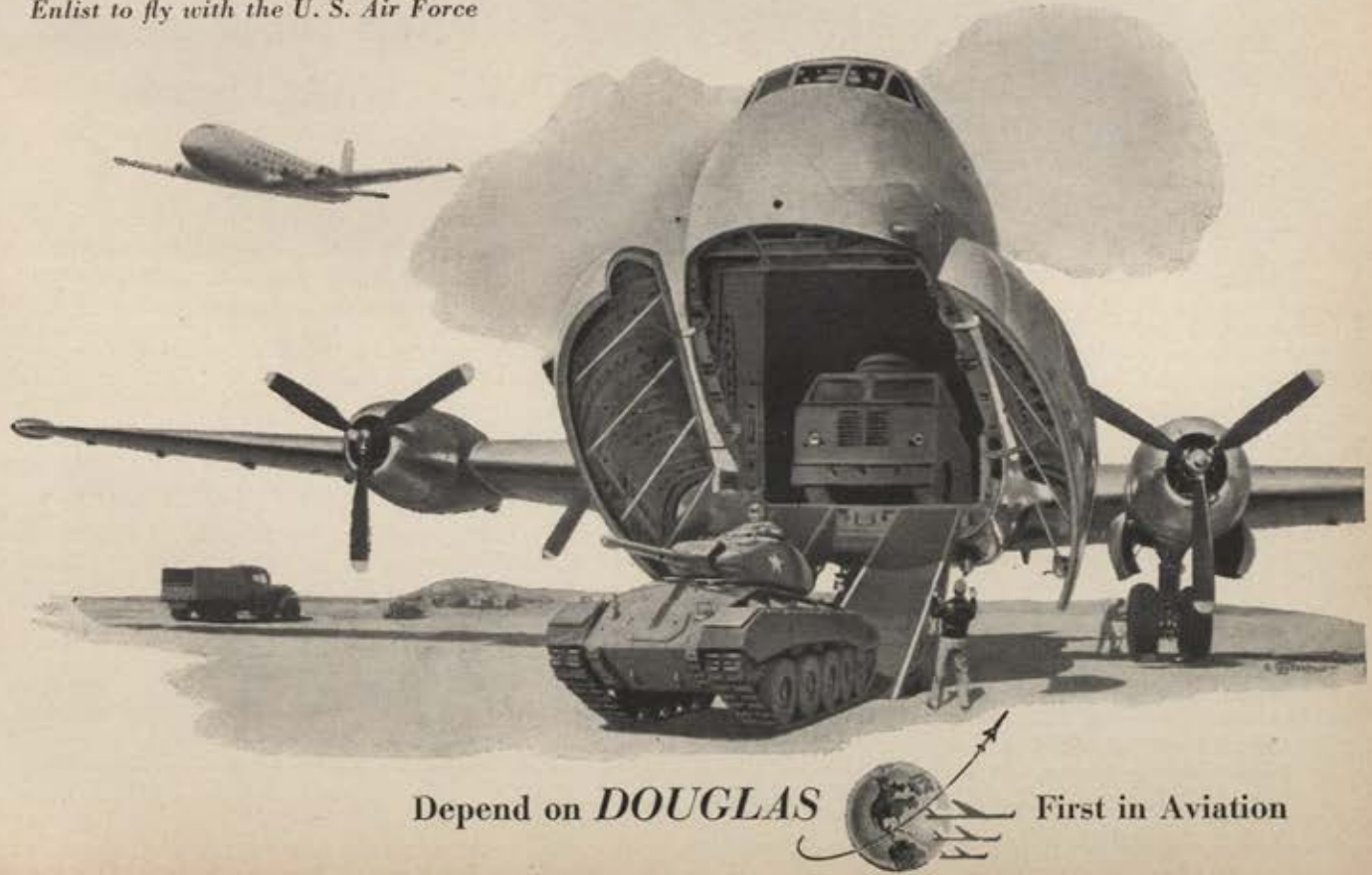
Most versatile troop and cargo carrier in the air today, the Douglas Globemaster gives our Armed Forces new mobility in either attack or defense.

Designed to take off at a gross weight of more than 87 tons, the Globemaster II —in flight tests—exceeded planned capacity by nearly 18 tons. This aerial giant can lift 94% of all types of military vehicles fully assembled . . . tanks, bulldozers, huge cranes and loaded trucks.

A single C-124 can transport 200 completely equipped troops across the Atlantic and land with generous fuel reserves. When used as an airborne hospital, it can accommodate 127 litter patients . . . plus all of the necessary doctors, nurses and attendants.

Performance of the C-124 Globemaster is another example of Douglas leadership in aviation. Building planes that can be mass-produced to fly *faster and farther with a bigger payload* is always the basic rule of Douglas design.

Enlist to fly with the U. S. Air Force



Depend on *DOUGLAS* **First in Aviation**

Shooting the Breeze

THERE are a lot of things you can buy for five dollars—four haircuts, twenty bottles of beer, a box of passable cigars. Or you can go to the movies a couple of times and have enough left for popcorn.

One of the best five-dollars-worth of value you can find in this day of fat prices and slim dollars, we'd guess, is Associate Membership in AFA. We say that with a note of pride, too, since AFA opened its membership to Associates only a few months ago at $5 per year, replacing the former, non-membership category of Associate, which had cost $10 per year plus a $5 initiation fee.

Now, for one-third the old cost, you get all the advantages of the Associate category (including a year's subscription to this magazine) in addition to the facilities of AFA's Personal Services Department, eligibility for AFA's new aviation accident insurance, affiliation with a forward-looking airpower organization, and all the other benefits of membership in AFA.

What AFA has done, by creating an Associate Membership, is pay tribute to the increasing importance of individuals who are interested in airpower but have never been in the Air Force. They now enjoy all rights and privileges of AFA except voting or holding office.

It's the best way we know for an individual to assert his belief in airpower as an instrument of national defense.—END

AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

Vol. 36, No. 5 • MAY 1953

FEATURES

PENTAGON PLANNERS 16
AIR FORCE VETERAN IN GOVERNMENT 23
THE TRUTH ABOUT OUR AIR DEFENSE ..... an AIR FORCE Magazine Staff Study 25
SHOULD MY HUSBAND QUIT THE AIR FORCE? ..... by Norma Schenk 30
SHOOTING WAR IN KOREA 38
AVIATION'S MIGHTIEST CUSTOMER 43
THE AIR MATERIEL COMMAND ..... an AIR FORCE Magazine Chart 44
LETTER FROM LONDON ..... by Derek H. Wood 46
CHANGES IN THE AIR ..... by Ralph V. Whitener 50
YOU'VE GOT TO PROVE IT! 71
'53 CONVENTION OFFICIALS NAMED 73
DESERT SLEIGH RIDE ..... by H. G. Medlock and Everett E. Dodd 81

DEPARTMENTS

Air Mail 4
Rendezvous 6
Airpower in the News 13
People in the Air News 18
Wing Tips 23
Tech Talk 53
Technique 54
Mobilization News 61
ANGuard Angles 62
Jet Blasts 65
AFA News 74

THE COVER

To dramatize the terrible need for the kind of air defense we discuss beginning on page 25, our artist Chuck Barnes has chosen to render his version of a night attack on Washington, D. C. Russian TU-4s fire guided missiles with atomic warheads as they move up the Potomac toward the capital. In the background the devastated city huddles at the juncture of the Potomac and Anacostia Rivers. A new-type, US guided missile zooms up toward the lead plane in the center of the picture.

MEMBERSHIP IN AFA

AIR FORCE Magazine is mailed monthly to all members of the Air Force Association. There are several ways you can become a member. If you were in the Air Force or its predecessor services, you're eligible. The $5 yearly dues include the magazine. Or if now on active duty, you can be a Service Member. Those interested in airpower can become Associate Members for $5 per year. The cost for CAP and AF-ROTC cadets is $3 per year. Details of membership in AFA on page 88.

CUT OUT AND MAIL TODAY

Air Force Association — 5-53
1424 K St., Northwest
Washington 5, D. C.

Sign me up as marked below. I enclose a check or money order for the amount indicated.

- ☐ Membership in AFA (includes year's subscription to AIR FORCE Magazine) $5
- ☐ Service Membership in AFA (includes magazine subscription) $5
- ☐ Associate Membership in AFA (includes magazine subscription) $5

Name .....
(please print)

Street .....

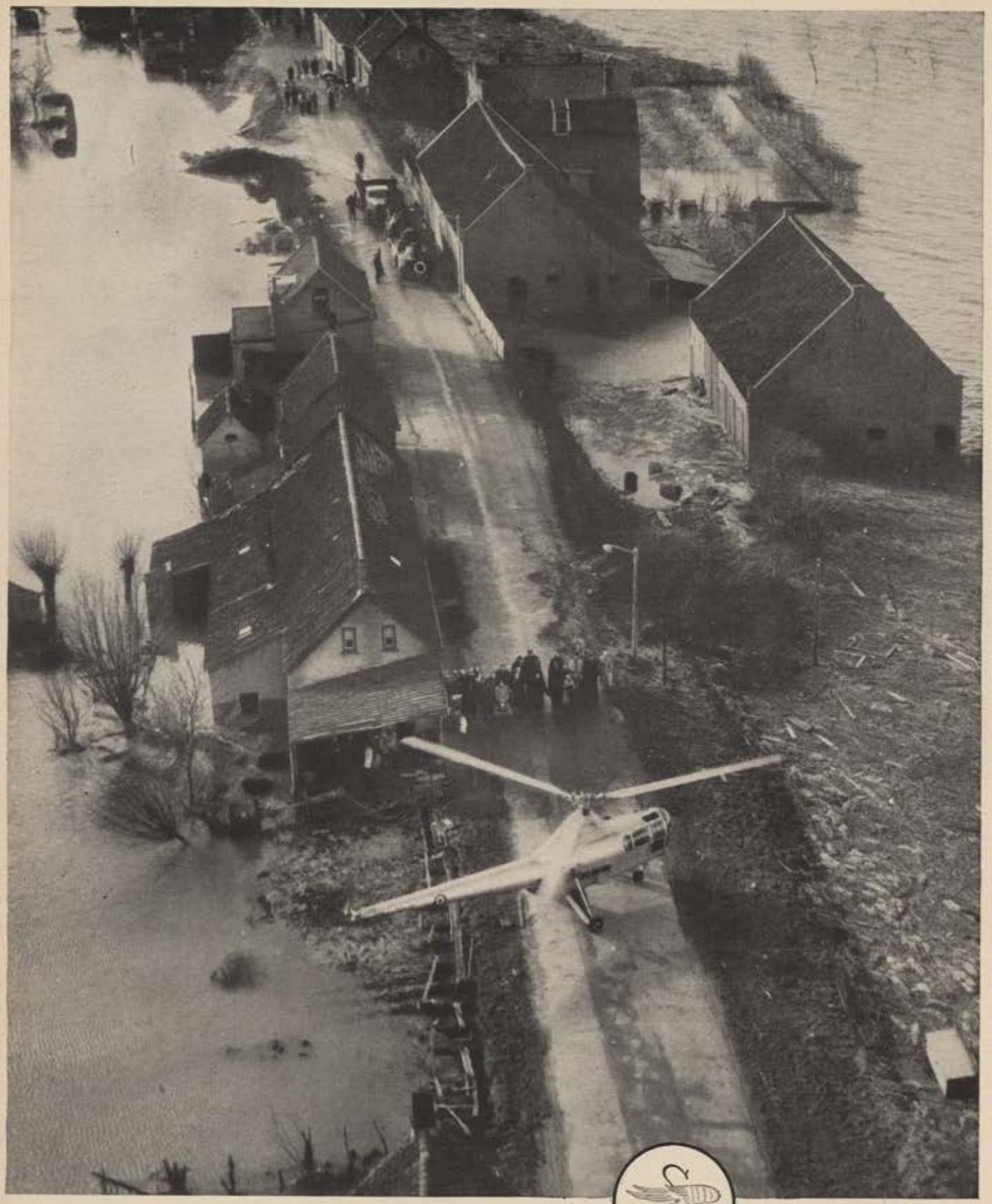
City ..... Zone ..... State .....

MALAYA—Sikorsky S-55 and S-51 helicopters have strengthened British forces in Malaya, where their ability to operate without prepared landing fields is particularly valuable, in the struggle against communist guerrillas. Here a group of S-55s flies in review at the Royal Navy Air Station, Gosport, England, before embarking for Malaya on a British aircraft carrier. They were supplied under terms of the Mutual Defense Assistance Program.

AROUND THE WORLD WITH SIKORSKY HELICOPTERS

KOREA—A mine-spotting Navy Sikorsky HO3S helicopter takes off from its floating base on the deck of an LST somewhere off Korea. From a hovering position, its pilot can spot submerged mines not visible from shipboard. With helicopter-minesweeper teamwork, safe channels can be cleared quickly, and danger reduced to a minimum.

LABRADOR—Pilots of Marine Air Group 26 gave their HRS Sikorskys a workout over the bleak Labrador coast recently in training maneuvers. Specialized tactics, made possible by the extreme mobility and utility of helicopters, were tested in ship-to-shore operations. The Sikorskys were based on the aircraft carrier U.S.S. Kula Gulf.



HOLLAND—When the raging North Sea inundated lowland areas of Holland and England, thousands of victims were carried to safety by helicopters from American, British and Dutch military units. Sikorsky S-55 and S-51 types again demonstrated helicopter versatility, rescuing victims from the flood and bringing in relief supplies. Here an R.A.F. S-51 lands on a road isolated by the flood.

SIKORSKY AIRCRAFT

BRIDGEPORT, CONNECTICUT

One of the Four Divisions of United Aircraft Corporation

America's new double-edged weapon

The huge Boeing B-52 Stratofortress is the newest weapon being built for America's air arsenal. It is, in a sense, a double-edged weapon. Respect for its retaliatory striking force is a deterrent against aggression. And it is a weapon of offense that, if need arose, would add great strength to our strategic air arm.

This giant new Boeing is engineered to strike at sources of war power deep behind hostile frontiers. To accomplish this the Stratofortress is designed to carry heavy loads over vast distances—at high speed and extreme altitude. Such performance is necessary to counteract the efforts a potential enemy would make to protect vital targets.

Powered by eight powerful jet engines, the B-52 measures 185 feet from wing tip to wing tip, and its gross weight is more than 150 tons. Its speed and ceiling, though not revealed, are unique for an aircraft in the heavy bomber class.

Boeing is actively in production on the B-52. This air giant, and the six-jet B-47 medium bomber, have given Boeing more experience with multi-jet aircraft than any other company. This background, together with Boeing's 36-year history of sound engineering and production integrity, gives assurance that the B-52 will inherit the tradition of rugged dependability established by Boeing's Flying Fortresses and Superforts of the last war.

For the Air Force, Boeing is building the
B-47 Stratojet, C-97 Stratofreighter and the B-52 Stratofortress;
and for the world's leading airlines, Boeing has built fleets of twin-deck Stratocruisers

BOEING

AIRPOWER IN THE NEWS

BY JAKE CULPEPPER.

SCOREBOARD — Combat air losses (start of Korean war to March 1, 1953). . . . FEAF LOSSES: 711 USAF a/c (jets to ground fire—217, in aerial combat—76, to other causes—65; props to ground fire—278, in aerial combat—21, to other causes—54), 73 UN a/c, and 104 land-based USMC a/c. . . . ENEMY LOSSES: Destroyed—780, including 611 MIG-15s; probably destroyed—139, including 112 MIG-15s; damaged—863, including 775 MIG-15s (virtually all enemy losses in air-to-air combat). . . . Other USAF activities—Sorties flown—604,017; vehicles destroyed—64,579; railcars destroyed—8,612; bridges destroyed—628; tanks destroyed—1,140; tunnels—770; and troop casualties inflicted—144,795.

THE HUMAN ELEMENT — USAF Air Weather Service has turned to its airmen for a solution to the low enlistment rate, a problem currently plaguing the three services. Special Airman Advisory Board has been set up at Andrews AFB, Md., to tackle problems relating to the welfare of AWS airmen. . . . Chances for applicants to be commissioned aircraft observers are now greater than ever before. Unmarried men between ages of 19 and 26½ who have completed high school or passed GED tests may apply. . . . AF has launched an all-out drive to land some of the nation's college students for cadet flight training but is having hard time locating "salesmen." Qualified officers and airmen, as outlined in AFR 35-94, are urged to try for cadet procurement duty. . . . Chanute AFB, Ill., airmen no longer are forced to sweat out long lines under the new "sick call by appointment" plan. . . . FlyTAF and CrewTAF need physiological training technicians. . . . Airmen serving overseas may apply for aviation cadet or officer candidate school training or for both, effective August 1. . . . Total of 22,747 officers are listed as "Regulars" in AF Register for '53. . . . WAF airmen and certain other women with prior military service may now reenlist as base of their choice. There are thirty three bases in US to which WAF are assigned.

AF DOLLARS — AF can be credited with an important assist to the steel mills, foundries, and smelters of the country during 1952. Installations in ZI accumulated thirty-five percent more aluminum, brass, copper, and other non-ferrous scrap than it had in 1951 and raised its collections of iron and steel scrap by forty-two percent over those of the previous year. . . . Office of Defense Secretary has reviewed AF Heavy Press Program, which will continue as it is now programmed. . . . AF has announced that it will dispose of its surplus and obsolete equipment after fifteen AMC depots get together on how much the AF should keep. Disposal of unnecessary materials, halted since outbreak of Korean war, will partially relieve critical need for new warehousing and leased warehousing space. Items slated to go range from hairpins to complete aircraft engines.

AF BLUES — Black jump boots are now authorized for aircrew members (officers and airmen) as soon as clothing sales stores have more than enough to supply Air Police. . . . AF is considering changing WAF summer uniform to a one-piece affair made of some material suitable for world-wide wear. . . . The new, green, cotton sateen, two-piece fatigues for airmen should be available within nine months.

HIKES — Public Law 7, which replaced Davis Amendment to FY 1953 Appropriations Act, lifts restrictions on promotion to captain this year. But it does not permit promotion of all officers selected for the higher grades. Those who must be carried on recommended lists beyond June 30 are expected to be promoted by AF early in FY 1954.

(Continued on following page)

STAFF — AF reports sixty-three generals on its payroll who are not working in AF jobs. . . . New assignments include: Lt. Gen. Howard A. Craig, chairman of Inter-American Defense Board; Maj. Gen. Emmett (Rosy) O'Donnell, Jr., Deputy Chief/Staff, Personnel, USAF Headquarters; Maj. Gen. John P. McConnell, Deputy Director of Plans, SAC Headquarters; Maj. Gen. Raymond C. Maude, commander of AF Cambridge Research Center, Mass.; Maj. Gen. Walter C. Sweeney, Jr., CG of 15AF, March AFB, Calif. . . . Maj. Gen. Caleb V. Haynes, commander of Sheppard AFB, Tex., recently retired. . . . Maj. Gen. Samuel E. Anderson has replaced Lt. Gen. Glenn O. Barcus as Commander of SAF in Korea.

THE BASES — An oil painting of Cpl. Frank S. Scott for whom Scott AFB, Ill., was named some thirty-five years ago was recently accepted by Col. C. I. Ferris, base CO, from one of his airmen, artist S/Sgt. Bill G. Manley. Scott, first enlisted man to lose his life in an air accident, is the only EM for whom an AF base is named. . . . Plans are being made to form a "Rod and Gun" club at Andrews AFB, Md. . . . Wives of AF B-29 trainees now sit in on mission briefings at Randolph AFB, Tex. . . . Bryan AFB., Tex., is becoming center of Dutch AF training in US. . . . Limestone AFB, Maine, lately got its first B-36 wing. . . . Flying training is currently going strong at Laughlin AFB, Tex. . . . Transportation Corps at Ft. Eustis, Va., is offering an extension course on operation of small boats and harbor craft to airmen at Langley AFB, Va. . . . Largest graduating class in seven-year history of AF OCS, 597 men and women of Class 53-A, received commissions recently during ceremonies at Lackland AFB, Tex. . . . Western ADF took all trophies in first annual ADC Gunnery Meet at ADC's Weapons Training Center, Yuma County Airport, Ariz.

ARMY AVIATION — Army plans to use NCO pilots in its future flying structure, for which more money has been requested to boost its present pilot strength to 2,600. . . . An Army aviation school has replaced Air Training Department of Artillery School at Ft. Sill, Okla.

BRIEFS — Army, Navy, and AF are adopting common set of instructions for the preparation of detailed aircraft specifications. . . . AF has issued order for all-out participation by its units in observance of 50th Anniversary of Powered Flight Celebration during 1953. . . . More support for GOC's "Operation Skywatch" is being urged by AF. . . . AFA's Thomas Z. Fagan has been promoted to Director of Sales and Service at Bendix Scintilla Magneto Division. . . . Temporary duty visits to Britain during coronation period are banned for AF personnel. . . . Retired AF Lt. Gen. William E. Kepner has been elected executive vice president of Bell Aircraft Corp. . . . Gene Dodd, AF vet formerly with the Associated Press, United Press, and "Pathfinder" Magazine, has joined editorial staff of AIR FORCE Magazine. . . . Twenty-one USAF officers—first students ever to attend a formal course in flight safety—are now studying at University of Southern California.

COMING UP — May 16, Armed Forces Day. . . . May 14-17, Ninth Annual Forum American Helicopter Society, in Washington's Mayflower Hotel. . . . July 7-16, Twentieth National Soaring Contest to be held at Harris Hill, Elmira, N. Y. . . . July 23-August 26, Second Annual Education Workshop, University of Colorado, Boulder, Colo. . . . August 20-23, 1953 AFA National Convention in Washington, D. C. . . . September 5-7, National Aircraft Show in Dayton, Ohio.

The future of automatic flight is being shaped here

In discharging its responsibilities as the world's largest producer of aviation instruments and accessories, Eclipse-Pioneer must be constantly developing and testing for the future, as well as maintaining the highest possible quality performance in today's products. To accomplish this complex two-fold job requires far more than just ordinary methods and facilities. One of many of Eclipse-Pioneer's unique facilities is a high-precision analog computer installation used for testing and advancing world-famous E-P automatic flight systems. Capable of solving problems involving 28th order differential equations having as many as twenty continuously varying coefficients, this electronic brain's answers to simulated flight conditions and related problems are important not only in attaining highest performance in present systems, but also in hastening the tomorrow when more complete, more efficient flight systems will make the automatic airplane completely practical. Here is genuine evidence and a typical example of the way Eclipse-Pioneer is working to produce constantly better and better precision products for the world of flight.

WORLD'S LARGEST PRODUCER OF AVIATION INSTRUMENTS AND ACCESSORIES

PRECISION PRODUCTS* MADE BY ECLIPSE-PIONEER

- Automatic Pilot and Flight Path Control Equipment
- Airplane and Engine Instruments
- Flight and Navigation Instruments
- Power Supply Equipment
- Air Pressurization and Ice Elimination Equipment
- Engine Starting Equipment
- Oxygen Equipment
- Precision Components for Servo-mechanism and Computing Equipment
- Sand, Permanent Mold and Die Castings of Magnesium and Aluminum
- Plaster Mold Castings

**Manufacturing capacity is now available for a great many models of these products.*

Eclipse-Pioneer

TETERBORO, NEW JERSEY · DIVISION OF Bendix AVIATION CORPORATION

Export Sales: Bendix International Division
72 Fifth Avenue, New York 11, N.Y.

PENTAGON PLANNERS

Harold E. Talbott, Secretary of the Air Force, long associated with aviation enterprises, took office in the Pentagon February 4, 1953. Talbott, 65, was born in Dayton and graduated from Yale. In World War II his Dayton-Wright Company produced more planes (DH-4s and 9s) than any other US plant. Talbott became a major in the Air Service. In 1925 he moved to New York and became a director of the Chrysler Corporation. In 1932 and 1933 he was Board Chairman of North American Aviation, and during WW II was director of aircraft production of the War Production Board. He's married and has four children.

Roger Lewis was director of sales for Curtiss-Wright before taking office April 3 as Assistant Secretary of the Air Force (Materiel). Born in Los Angeles in 1912, he was graduated from Stanford in 1934, then worked for Lockheed and later for Canadair.

James H. Douglas was a lawyer in Chicago with Winston, Strawn and Shaw before taking office March 3 as Undersecretary of the Air Force. Born in Cedar Rapids, Iowa, in 1899, he was graduated from Princeton and Harvard Law School. In World War II, as an Air Force colonel, he became chief of staff of the Air Transport Command and won the Distinguished Service Medal. He's married, has four sons.

H. Lee White, a partner with a New York law firm before becoming Assistant Secretary of the Air Force (Management) February 17, was born in Oswego, N. Y., in 1912. He was graduated from Cornell Law School and in WW II was a Naval Commander.

"IMPOSSIBLE" ICECAP RESCUE

ON THE SEVENTH day, the plane overhead radioed, "We'll try to take your injured men off tomorrow."

But to the twelve men huddling against a temperature of 20° below inside their wrecked Royal Air Force transport plane, there was little hope. They had crashed where the Greenland icecap was 8000 feet above sea level. No skiplane, they thought, could take off from that altitude.

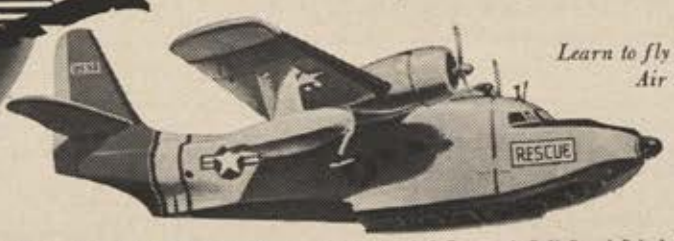
The next day, the wind plagued them with a mirage of engine sounds. Finally a hum grew, and an angel speck became a twin-engine—

"An amphibian? To land here?"

She did, then even taxied over the snow to the wreckage to load the stretcher cases. An hour of agony followed. Finally the JATO bottles were mounted to her hull, and she made the "impossible" take-off. Within two days, all were rescued.

Grumman salutes the USAF Air Rescue Services crew of that Grumman SA-16. Especially proud are the engineers who wedded a retractable ski to the amphibian keel, who created the Grumman Albatross *Triphibian* and made it possible to help save men on snow and ice, as well as sea and land.

Grumman



Learn to fly with the U. S. Navy, Air Force, Marine Corps, or Coast Guard.

GRUMMAN AIRCRAFT ENGINEERING CORPORATION · BETHPAGE · LONG ISLAND · NEW YORK

PEOPLE

IN THE AIR NEWS

1st Lt. Joseph McConnell, Jr., F-86 pilot with the 51st Fighter-Interceptor Wing in Korea, who became jet ace number 27 March 9 after combat film evaluation of an earlier air battle credited him with a MIG. He destroyed his first MIG on January 14 and made ace in just over a month. His wife lives in Apple Valley, Calif., and his father in Dover, N. H.

Maj. James P. Hagerstrom, who is jet ace number 28. A member of the 18th F-B Wing, he destroyed a MIG last Christmas Day without firing a shot. He got on the tail of the MIG which started to climb to get away. Before Hagerstrom could fire, the MIG spun out and crashed. The new ace is from Tyler, Tex. His parents live in Waterloo, Iowa.

Col. James K. Johnson, Phoenix, Ariz., who became history's 29th jet ace March 28. He has six MIGs and shares credit for another, has probably destroyed three and damaged seven others. He's been CO of the 4th F-1 Wing since last November when he replaced another jet ace, Col. Harrison Thyng. Johnson flew P-47s in Europe in WWII and destroyed one enemy plane.

Lt. Col. George L. Jones, F-86 Sabrejet pilot from Vero Beach, Fla., who is jet ace number 30. A member of the 4th Fighter Interceptor Wing in Korea, Jones is credited with shooting down the UN's 100th MIG in October 1951. Another time, under his leadership, his squadron claimed nine out of ten MIGS destroyed or damaged in a single battle, believed a squadron record for Korea.

THIS LANDING GEAR ACTUATOR
IS PRODUCED BY FOOTE BROS.
FOR THE BOEING B-47

it takes a strong arm to support the landing gear for a 185,000 pound airplane

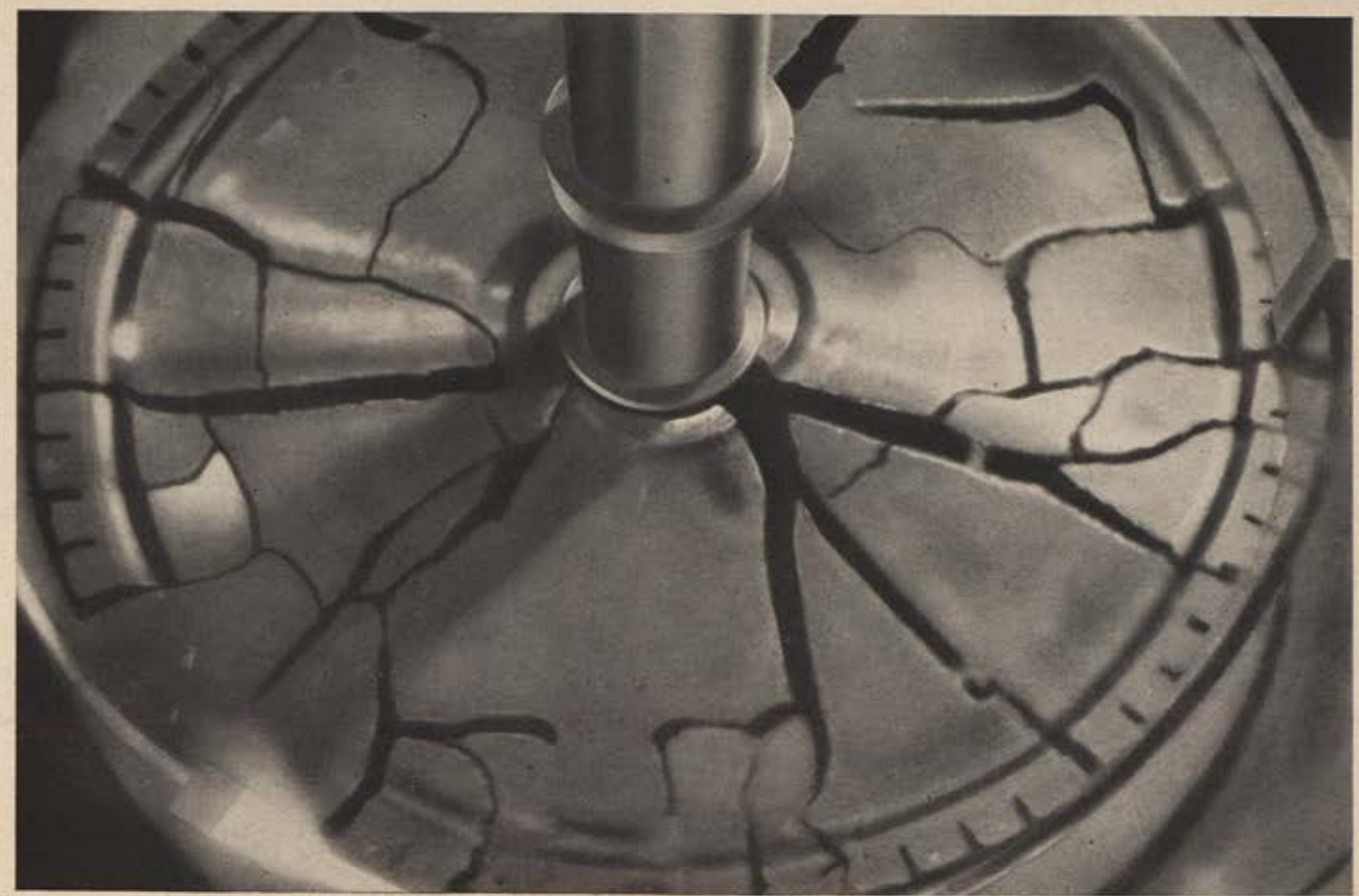
FOOTE BROS.

Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION

4545 SOUTH WESTERN BLVD., CHICAGO 9, ILLINOIS

ANOTHER REASON ALLISON LEADS IN THE AIR



We burst this wheel to prove its strength

Allison turbine wheels also are spun at overspeeds for proof of quality in production as well as for laboratory development.

You are looking at a photograph of a jet engine titanium compressor wheel being deliberately disintegrated by Allison engineers in a super-high-speed test. First, our engineers spun the wheel at the highest rpm the test machine could produce—and it would not burst. Then they cut a notch in the hub and the wheel "let go" at 22,000 rpm—5,000 rpm higher than the strongest steel wheel could stand. This picture taken at 2-millionths of a second showed our engineers the action at the instant the wheel burst.

Tests like this aren't new—but this one served to show that the new higher-strength, lighter-weight titanium alloy wheel has a safety margin of many thousands more rpm than would ever be experienced in actual flight. Careful testing like this forecasts tomorrow's successful application of new metallurgical developments—typical of the continuous pioneering which maintains the leadership for Allison engines in the air.

GM
GENERAL MOTORS

Allison
DIVISION OF GENERAL MOTORS
INDIANAPOLIS, INDIANA

World's most experienced designer and builder of aircraft turbine engines — *J35 and J71 Axial, J33 Centrifugal Turbo-Jet engines, T38 and T40 Turbo-Prop engines*

Muscular Power

that controls the McDonnell "Banshee"

Even before she leaves the deck of a Navy Carrier, her pilot has this swift jet under finger-tip control . . . elevator trim tabs, wing pins and camera moved and positioned by Lear electro-mechanical actuators.

Through Lear drive systems incorporating Screw Jacks, "T" Drives and Flexible Shafting, the Lear Power Unit illustrated transmits the required power.

Engineered to meet the specialized requirements of the "Banshee"... and other well-known aircraft ... Lear Control and Actuating Systems provide space-saving power. On the "Banshee" such power is at the pilot's instant command through touch of a button or via automatic controls.

In aircraft large and small, military and commercial, Lear Controls, Actuating Systems and Components are making flight smoother, faster, more economical ... and safer.

LEAR POWER UNIT Series 156
Typical of units designed for the McDonnell F2H-2. Specially developed as a power source, produced to meet specific aircraft requirements.

LINEAR AND ROTARY ACTUATORS

ELECTRO-MAGNETIC CLUTCHES

SPECIAL MOTORS

SCREW JACKS

•

OTHER ELECTRO-MECHANICAL EQUIPMENT:
Electronic Temperature and Positioning Controls • Servo Actuators • Sub-miniature Motors • Dry Powder Clutches • Motor-driven Precision Gear Mechanisms

Advancing the Frontiers of Flight

Lear

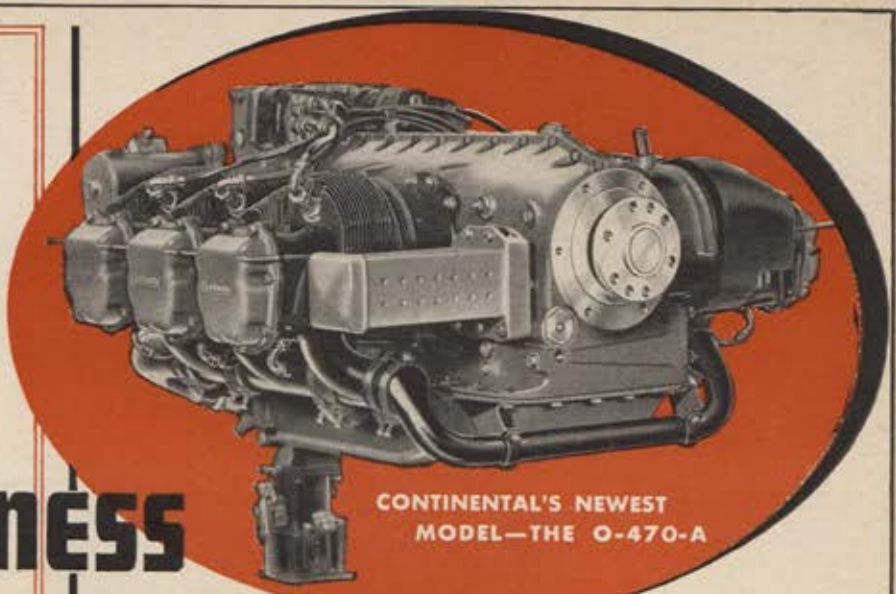
GRAND RAPIDS DIVISION

110 IONIA AVE., N.W., GRAND RAPIDS 2, MICHIGAN

•

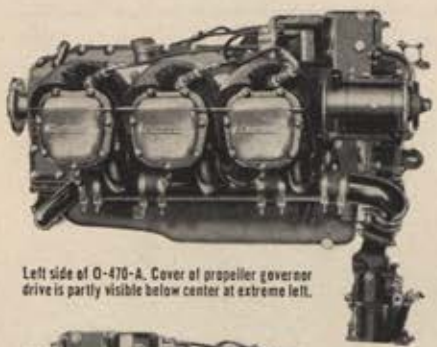
LEAR-ROMEC DIVISION, ELYRIA, OHIO
LEARCAL DIVISION, LOS ANGELES, CALIFORNIA
LEAR, INCORPORATED, GRAND RAPIDS 2, MICHIGAN

here's POWER with COMPACTNESS



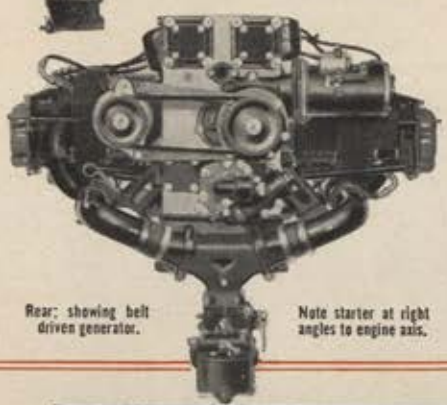
CONTINENTAL'S NEWEST MODEL—THE O-470-A

...Plus New Maintenance Ease



Left side of O-470-A. Cover of propeller governor drive is partly visible below center at extreme left.

Right side. Rectangular projection at right is new integral oil cooler. External oil lines are eliminated.



Rear; showing belt driven generator.

Note starter at right angles to engine axis.

This great new Continental—the O-470-A—strikes an unusual balance among the factors that spell utility in a plane.

•

There's POWER for sparkling all-round performance—225 h.p. @ 2600 r.p.m.

•

There's COMPACTNESS which, by permitting minimum envelope, helps to wring the utmost from that power. Minimum overall height is under 20 inches; minimum overall length just over 36.

•

There's new SERVICING EASE. The valve mechanism is accessible without removing the engine from the plane, thanks to automatic hydraulic valve lifters of improved design. Magnetos are handily located on top of the engine ahead of the mounting brackets, permitting unusually short ignition harness. V-belt provides positive, troublefree, and inexpensively-replaced generator drive.

•

The O-470-A, in short, is engineered and built to lengthen the longstanding leadership of Continental aircraft power.

CONTINENTAL MOTORS · Powerful as the Nation · AMERICA'S STANDARD

ONLY CONTINENTAL BACKS YOU WITH ESTABLISHED WORLD-WIDE SERVICE

Continental Motors Corporation
Aircraft Engine Division
MUSKEGON, MICHIGAN

Wright-Patterson AFB is nearly twice the size of New York's Idlewild Airport, the world's largest civil airport. The air base, with more than 7,000 acres, has 12 miles of railroad track, 112 miles of telephone lines, 18 miles of gas lines, and 80 miles of water lines.

° ° °

Gifts for the girl friend flown from all over the world are the contribution Air Shopping Service of New York is making to the Air Age. You can order a heart-shaped, silver pendant from Siam for $9, or a "huge ponderosa lemon festooned with ribbons" from Cuba. A grapefruit-sized lemon will wing its way to some loved one for $2.50.

° ° °

Have you tried Air Shopping's "Airborne Dinner of the Month"? Sample menu: shrimp from New Orleans, filet of green turtle from Key West, caraway cheese from Denmark, and jungle corsages from Venezuela for the ladies. Flying data on each item provides interesting dinner conversation.

° ° °

The Bonneville Power Administration, which operates a 2,500-mile power system in the Pacific Northwest, finds it cheaper to inspect power lines from the air. Inspection costs are $1.40 per mile by helicopter and $2.65 per mile by ground methods.

° ° °

The first thousand miles a Grumman Albatross travels is by truck. The 60-foot fuselage is hauled from southern Indiana through six states to Long Island, N. Y., for final assembly.

° ° °

Douglas Aircraft test pilots cover about four million miles a year testing experimental planes.

° ° °

The Civil Aeronautics Administration has more ups and downs than all other federal agencies put together. At CAA control towers an airplane goes up or comes down every two seconds.

° ° °

The closest thing to every man's flying auto these days is provided by the Rent-A-Car system at airports. In 1952, car rentals at airports were forty percent above 1951. One hundred cars are assigned to Detroit where the job of driving from the airport into town is the same as setting out on a weekend motor trip with a picnic lunch.

° ° °

If you have trouble getting yourself back and forth to the job in these days of crowded commuting, set your sights on being president of General Motors. Harlow Curtice lives 65 miles from work, in Flint, Mich. He boards a plane every morning at 7:30 and shows up in Detroit 17 minutes later.

° ° °

And now they're talking about four-hour jet service from New York to Los Angeles for transcontinental commuters of the future. You leave New York at 7:30 in the morning, say, and arrive on the west coast by 8:30—their time. No tougher than coming into New York on the Long Island Railroad, as far as the clock's concerned.

° ° °

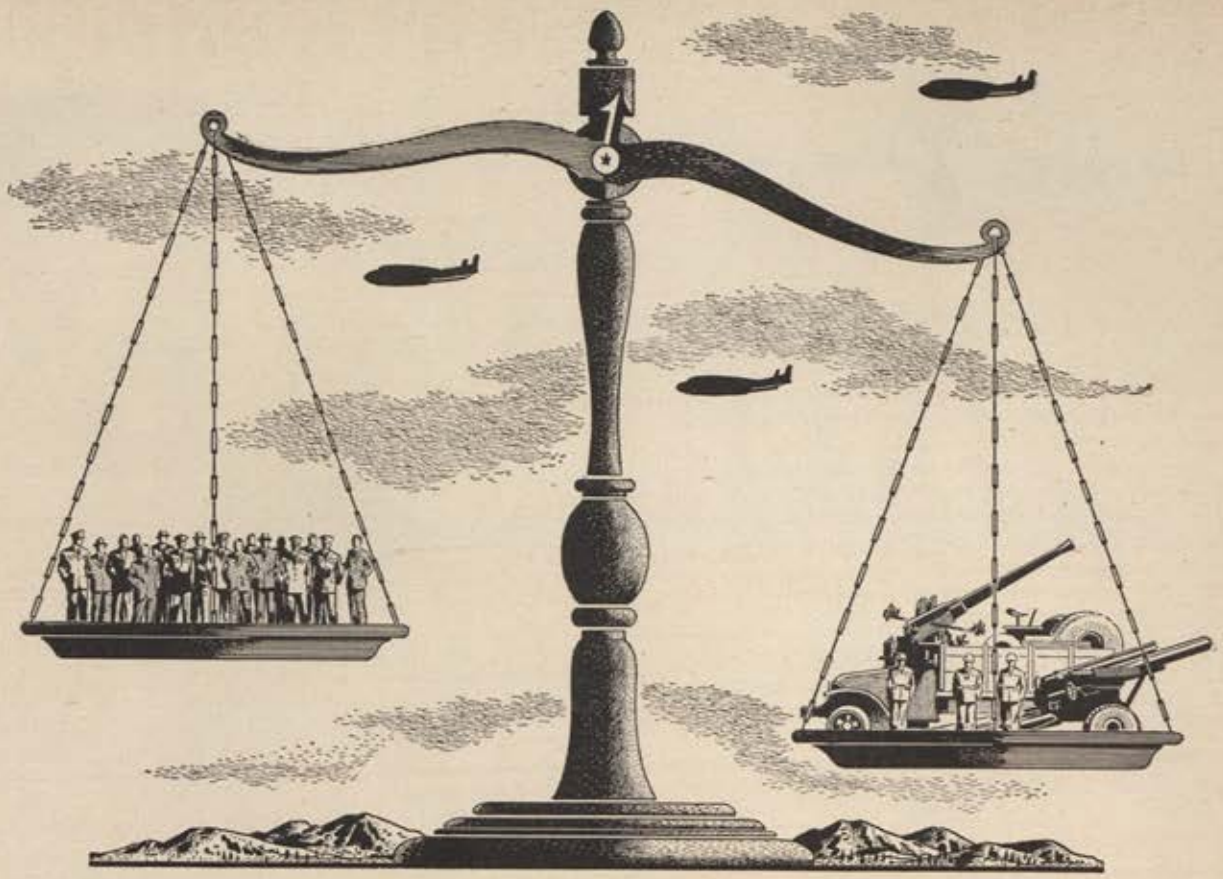
But the trip home is going to be rough!

By Wilfred Owen

AF VET IN GOVERNMENT

Nils A. Lennartson

ONE OF the most active of the Air Force's inactive reserve officers since the end of World War II is Nils A. Lennartson, whose recent appointment as an Assistant to Treasury Secretary George M. Humphrey, with chief responsibility for public information activities, marks the third governmental agency in which he's tackled top jobs since 1948. The past year he was Director of Public Information for the Commerce Department after nearly four years as Deputy Director of Public Relations and Special Assistant to the AF Secretary. A native of Webster, Mass., he graduated from Bates College, Lewiston, Maine, in 1936, and for six years was a reporter for the Guy Gannett Newspapers at Portland, Maine. Entering the Army Air Forces as a private in April 1942 and receiving a commission as second lieutenant at Miami's Officer Candidate School, he served as Division Intelligence officer in Brazil from 1943 to 1945, and was on duty with Headquarters, ATC, in Washington for six months before reverting to inactive duty as a captain in 1945. He was with the Maine Central Railroad at Portland, Maine, and the US Steel Corp. at Boston until returning to the AF as a civilian in 1948. He got the AF's Exceptional Civilian Service Award in May 1952.



Watch Out for "Cost per Ton-Mile"...

IT'S LOADED!

"Cost per ton-mile" is what military planners watch in everything that concerns air transport to our Armed Forces. And rightly! But let's be careful what we mean by "ton-mile cost." It's got to be *loaded* cost.

Men can march on and off *any* plane. The big problem is equipment . . . tanks, trucks, bulldozers, massive pieces. Operating cost for such shipments *must* include loading and unloading . . . with all the attendant factors. If equipment has to be knocked down and crated, then uncrated and reassembled at destination . . . that's cost. Man-hours for handling, expensive machinery for carting, hoisting, stowing . . . that's cost. And longer turnaround time for these cumbersome operations is also cost . . . idle aircraft eating up dollars.

Reckoned completely, with all these factors, ton-mile cost for the Fairchild Packet C-119 is the lowest ever achieved in air history! Tanks and trucks roll up its ramp as easily as men march in. Bulk cargo goes "as is." Turnaround time is the fastest ever. And in addition, this rugged "Flying Boxcar" is the most versatile in air transport. No other aircraft has remotely approached its successful score for air drops of men and materiel . . . 10 tons dropped from a single C-119!

No other aircraft can match its record for "dirty jobs" done triumphantly . . . short-haul and long-haul, from the Berlin airlift to Korean mountains.

To military men all over the world, the TWIN BOOM of the Fairchild Packet means "big stuff" ready to land . . . tons of bulky supplies or squads of troops ready to pour down the ramp and go into action at the lowest total cost in money and time. That's lowest *total* cost . . . *ton-mile cost loaded, and unloaded.*

ENGINE AND AIRPLANE CORPORATION

FAIRCHILD

HAGERSTOWN, MARYLAND

EASE OF LOADING any type of bulk military materials—fully assembled in minimum time—means greater military successes and lower "*cost per ton-mile.*"

ANY TYPE OF MILITARY LOAD from bulldozers to anti-aircraft batteries—men and supplies—fully assembled and equipped—ready for action—means lower "*cost per ton-mile.*"

TURN-AROUND TIME is reduced to the absolute minimum—with rapid unloading features—and no special handling equipment needed—means lower "*cost per ton-mile.*"

HUSBAND QUIT THE AIR FORCE?

The answer didn't come easy for us but an automobile accident had a lot to do with our final decision. We hope we're right

ILLUSTRATED BY EDWARD WALTON

By Norma Schenk

ONE SUNDAY afternoon during World War II, when my husband was overseas, I gathered my carefully hoarded gasoline coupons and started off on a jaunt, alone. A couple of hours and fifty miles later I was involved in a serious accident—one which sent four persons to the hospital.

By the time the police arrived I was in a state of near hysteria. They asked if there was anyone I could call. I remembered there was an Air Force base nearby and asked the police to call the Provost Marshal.

Within minutes he arrived complete with four MPs. He assisted the police, asked for my driver's license and insurance card, put me in his car, and drove me to his home. His wife insisted that I stay overnight and promptly put me to bed.

The Provost went to the police station, filled out the necessary reports, found a garage to repair my car, informed my insurance company, visited the hospital to check on the injured, and then came home to tell me there was nothing to worry about. My husband had never served at the base. I was a complete stranger. And there was nothing in the regulations that required the Provost to take on my troubles.

Was he a particularly thoughtful individual? Not necessarily. I can explain it only in this way: He was a service officer, I was a service wife.

I like to cite this incident as one answer to the question which so many of our civilian friends put to us—"Why do you stay in the Air Force?" It's a question that is becoming increasingly difficult to answer even with examples like the one just cited.

Only a few weeks ago my husband, a career officer, was offered a position with a big industrial organization at twice what his present salary is. In fact it was more than he can ever hope to earn in a military career. It was the fourth such offer in the past eighteen months. My husband isn't a genius. Hundreds of well qualified, experienced, and imaginative officers in our armed forces get these offers regularly. But my husband sticks with the Air Force. I am in complete agreement with his decision.

It is amazing that so many civilians know so little about family life in the military. Take the matter of pay and allowances. Many believe that all officers float on a green sea of tax dollars, pay fifteen cents a pound for rib roast, get cigarettes for a dollar a carton, and call the nearest hospital at two a.m. for a doctor to give Johnnie an aspirin. And evidently many congressmen share these ideas.

Let's take a look at some of the recent laws affecting the military family. First, the pay raise. Government workers received a ten percent raise in July 1951. Evidently people in uniform are not considered government workers. It took almost a year of heartbreaking work to convince our lawmakers that we, too, must eat. We got our raise, eventually. It wasn't ten percent. It wasn't retroactive and in the extra

(Continued on following page)

year it took to get it the increased cost of living ate up most of the boost.

The other advantages are vastly overrated. Commissary, post exchange, medical attention, and the like are not legal rights. They are privileges which may be withdrawn at any time. And most of them have been. Local businessmen, who resented the little business that a commissary or post exchange may have taken from them, squawked so loudly that the bulk of these privileges have been withdrawn. Nobody starved, nobody sold the family silver. But morale took a dive, and morale is the life's-blood of the military. Make no mistake about it.

Medical care for dependents is an undeniable advantage. It, too, is a privilege, extended on a "space available" basis. Most service families with children look up a local physician at each new station. There is, of course, no such thing as a house call by a military doctor. Hospital care does help and we thank God for it nightly.

Housing is the biggest problem. Let me give you an example. My husband returned from overseas in July 1946 and was ordered to duty in Washington, D. C. We left our small son in Philadelphia with his grandparents, took a room, and hit the sidewalk at 6:30 every morning armed with high purpose, silent prayer, and *The Washington Post*. November 23—a date I shall never forget—we found a house. I shan't describe it in detail. I don't dare. But open sewage sloshed in the basement every time it rained, and my small son wore his snow-suit as part of his normal indoor clothing. We couldn't report it to the Board of Health because they'd have made us move—and there wasn't anything to move into.

Why didn't I go home to mother? Because a military man has as much right to a home life as any other citizen. He should expect his children to grow up under his personal supervision. Why else does a man marry? Whether we live in furnished rooms or mansions is not the question.

Why weren't we living in quarters? My husband has been an Air Force officer for twelve years. I have lived in quarters exactly eighteen months and I've been lucky. We dream of quarters as a civilian wife dreams of a mansion. Not because government quarters are luxurious. They aren't. It is luxury enough to go to a new station and know a place to live in is waiting for you.

These are some of the reasons why the percentage of young men who decide to stay in the service has dropped to a new low. Even more disturbing is the number of experienced men who are resigning. This is not a local problem. It affects every American family. Unless educated, intelligent, and imaginative men decide—now—to enter the military on a permanent basis, our great defense force will sink year by disastrous year into the mire of mediocrity.

To me, a service wife is the wife of a career officer. This includes the "Regulars," who are comparatively few, percentage-wise, and those reserve officers serving on extended active duty who intend to remain permanently in the military. This group makes up the bulk of our permanent personnel today.

To the wife of the "short-termer" her husband's service is an interruption to an already well established life. She can circle a date on her calendar when she will again take up her "normal" routine. Her attitude toward the military is determined by the circumstances of her husband's service. If she enjoyed it, her reports to her friends and neighbors will be "good public relations." If not, her reports will add to the many such reports of "service life" (of which she knows little), for which we "permanent-type" wives must pay.

I have been refused housing more than once because a landlord thought service people were unreliable pay, and dirty to boot. Not a service wife, mister! She's been through at least one quartermaster inspection of vacated quarters. After that, it's second nature to leave a house in good condition. When the truck pulled away from our quarters in the Panama Canal Zone I accompanied the inspecting officer through the empty rooms. He opened every closet and examined the stove and refrigerator to make sure I was leaving a clean house for the family which would move in.

Bad pay? Not service people! No career officer wants a letter, "through channels," requesting a full explanation for a bad check or an unpaid bill. And the service family knows that the entire group will suffer by the actions of any one of them—and service folk stick together.

One of the greatest differences between the life of a service wife and her civilian counterpart is timing. Let me explain. For the civilian the early years of marriage and a career are usually marked by the least material return. A military career reverses this procedure to a great extent. The facilities offered the young lieutenant and his wife are the same used by the general. I doubt that many newlyweds just out of college could afford to belong to a country club, yet they are entitled to the use of the Officers' Club. And the taxpayer does NOT contribute to the Officers' Club. It is entirely self-supporting.

If the young lieutenant is stationed in the south, he and his wife can probably afford domestic help. A tour of duty overseas gives them a chance to travel abroad. Conversely, as an officer is promoted his responsibilities grow while the financial returns get comparatively smaller. Any resemblance between a good man's value to the service and his salary at any given time is strictly coincidental.

The greatest single advantage to service life is, I believe, the unusual extent to which a wife shares her husband's career. When my husband leaves for work in the morning, he doesn't disappear into the nebulous fog of the "Business World" to engage in incantations of which I have no understanding or associate with people who are, to me, faceless names. My friends are drawn from his colleagues and their wives. Our children are familiar with his job and the people with whom he works.

Our civilian friends have often sympathized with us for the backbreaking job of packing a household and moving it not once, but dozens of times. With all due respect for their thoughtfulness, let me say that for me moving is one of the greatest joys of service life. It frees us from the routine monotony which plagues many of our civilian sisters. It is true that we wash as many dishes and as many clothes as does the rooted housewife. The difference is that we know that there will soon be the excitement of moving on to another place, other people, and a new situation.

These changes are more than merely exchanging one house for another. During the year I lived in Panama we had quarters on one of the most beautiful bases I've ever seen, Albrook Field. The house was spacious and we enjoyed the luxury of inexpensive domestic help. Our small son was just six weeks old when we left the States, and the extra help was a blessing only a mother can appreciate.

From Panama we came to Washington, where we lived in the house I have already described. This was a "riches to rags" change, certainly. But I don't look back on the easy life of Panama with a sense of melancholy nostalgia. It will happen again! Maybe tomorrow. It may not be Panama. As a matter of fact the chances of ever going back are exceedingly slim. We look forward instead. Unlike my civilian sister, who may long to see the Far East or Europe with very little hope of ever getting there, I

IN 24 NATIONS of the free world Gilfillan GCA Radar is standard equipment. Such world-wide acceptance is proof of the superiority of Gilfillan GCA Radar–global recognition of the dependability of this radar landing system to safely land military and civil aircraft at 200 bases and airports around the world.

In GCA and Radar Research, Design and Production

the FIRST name is *Gilfillan*

Los Angeles

GCA

It's a grim war. And it's a grim Capt. Frank H. Riggs awaiting tower's "go ahead." Riggs is boss-man of a B-29 crew flying out of Japan.

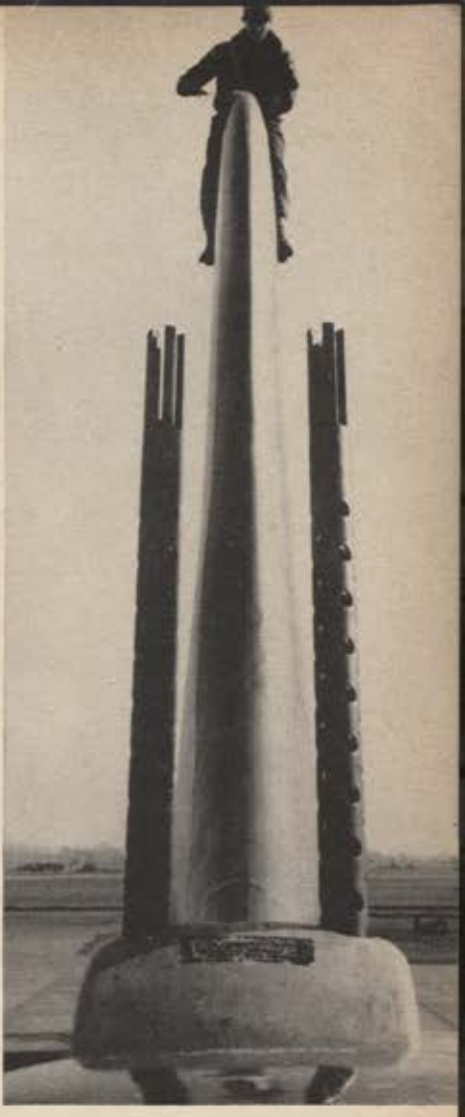
SHOOTING WAR IN KOREA

Shown climbing through the front hatch of a B-29 is M/Sgt. Mente O. Sharr. It's "start engines" time, and Sharr, a flight engineer, will shortly be a very busy man.

It's not the waste of war. It's the waits. Two B-29 crewmen sweating out plane commander's "Let's get aboard," use tires of B-29 for back rest. One augments his logged sack-time, drowses; other browses. A Tech Order?

Clobbered. Under that blanket of dust and smoke is what remains of a Red airstrip in North Korea after 1,000 100-pound bombs have been laid on it by Okinawa-based B-29s flying with the 19th Bomb Group.

The flight's over, but the mission's not. Three members of a 307th Bomb Wing's B-29 must still "fill in" a captain in Intelligence on mission.

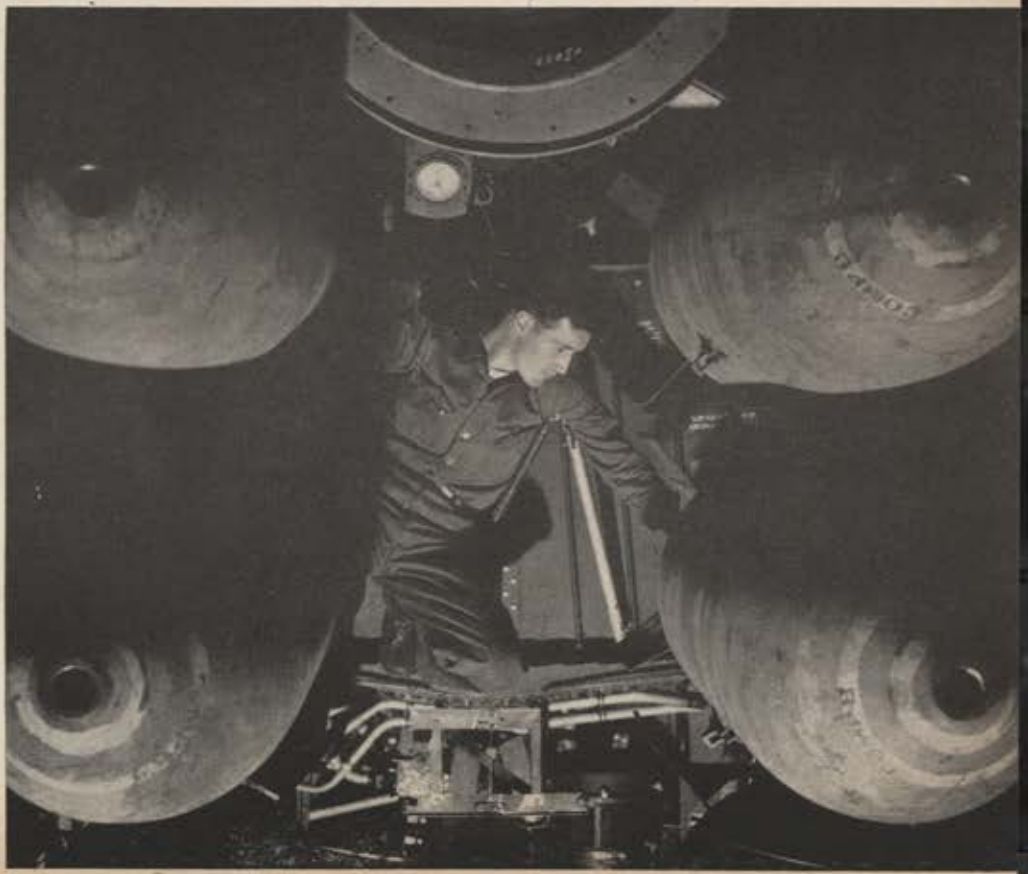


Leapfrog? No. A maintenance man makes repairs to antenna high atop a B-29's rudder. It's all part of the job of readying a Superfort for a mission. Those objects in the foreground are top turret's twin-.50 caliber guns.

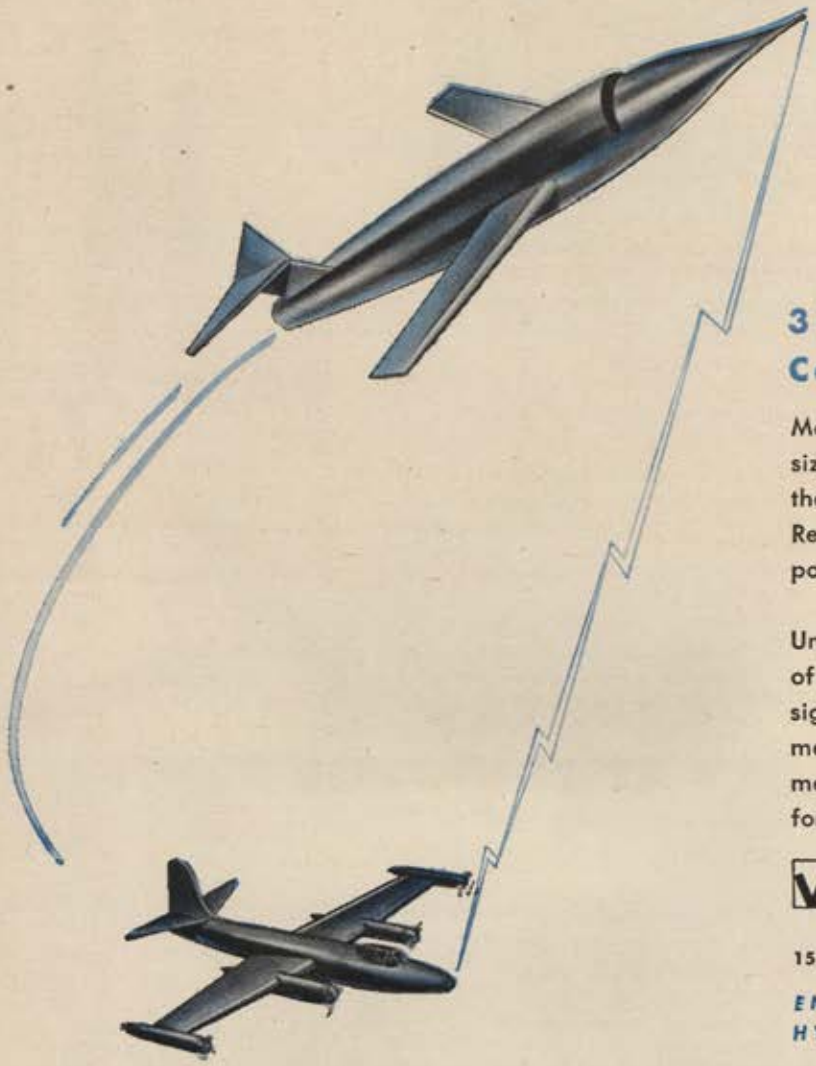
To paraphrase a noted statesman, "Given these men, the Air Force will finish the job."

A/1C Michael E. Burns, right waist gunner of a 98th Bomb Wing B-29, feeds a serpentine belt of ammunition into his hungry twin-.50 caliber machine guns.

A/1C James T. Dell is probably thinking what a bang the Reds will get out of these. An armament man, he's in a B-29's bomb bay, fuzing four 1,000-pound explosive bombs.



LIKE "opening a barn door in a hurricane"..... with a FEATHER



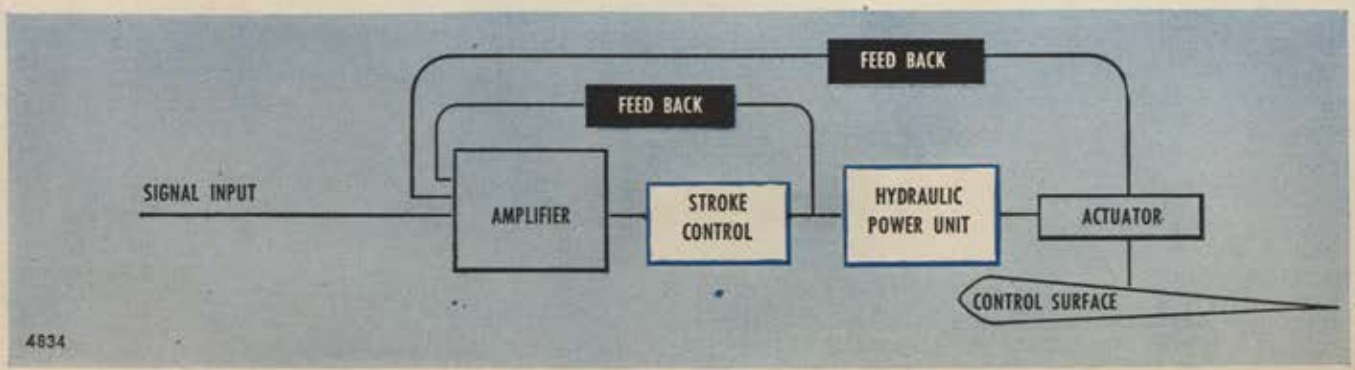
30 Milliamp Signal Controls 50 Horsepower

Modern aircraft control surfaces are not the size of a barn door but the wind across them is several times hurricane velocity. Results are similar . . . it takes plenty of power to control them.

Vickers Electro-Hydraulic Servo Power Units provide rapid and accurate control of up to 50 horsepower with a 30 milliamp signal. This is another Vickers accomplishment in the control of heavy power by means of very minute signal inputs. Write for special bulletin No. SE-18.

VICKERS Incorporated
DIVISION OF THE SPERRY CORPORATION
1526 OAKMAN BLVD. • DETROIT 32, MICH.

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921



4834

Production COUNTS — AT CANADAIR

At Canadair the first consideration is production: getting things done — that's Canadair.

At Canadair one quickly senses the steady tempo . . . the vigorous production flow . . . the sense of responsibility among the Canadair people and their pride of accomplishment in the finished product.

Yes, production counts at Canadair: counts in every aspect of manufacturing — in purchasing . . . engineering . . . tooling and planning — as Canadair builds lasting quality into the planes she makes.

CANADAIR

LIMITED, MONTREAL, CANADA

A subsidiary of
GENERAL DYNAMICS CORPORATION
New York, N.Y. — Washington, D.C.

CA53-9UST

MILITARY NEWS from the world's largest light plane producer

FIRST TURBOPROP LIGHTPLANE COMPLETES TEST AT CESSNA

Turbine in L-19 "Bird Dog" eliminates Vibration and Cooling Problems; Operates on almost any kind of fuel.

The Cessna XL-19B, world's first turbine propeller light airplane has successfully passed its initial flight test, the Cessna Aircraft Company announced recently.

The unusual flexibility of a turboprop engine—as revealed in the plane's first flight — provides control characteristics that are far superior, in some cases, to the L-19A, Cessna's combat-proved observation plane.

Advantages of the turbine over conventional engine include simplification of power plant installation, elimination of cooling problems and airborne vibration, plus ability to fly on almost any type of fuel.

Last year, much of Cessna production went to U. S. Armed Forces. Today, in Cessna shops at Wichita, Prospect and Hutchinson, Kansas, military work booms on a variety of new assignments in three locations.

Helicopter development for the Navy, faster assembly of battle-proved L-19 observation planes for the Army, National Guard, and Marines, more bomber and fighter sub-contracting for U. S. Air Force planes . . . plus accelerated commercial research on other developments including boundary layer control which speeds the take-off and landing of high-speed aircraft.

CESSNA AIRCRAFT COMPANY, WICHITA, KANSAS

IN ARMY OBSERVATION PLANES AND TURBOPROP RESEARCH . . .

Cessna

SETS THE PACE

☆ Helicopter Development, Bomber and Fighter Assemblies, Boundary Layer Control

AVIATION'S MIGHTIEST CUSTOMER

PUT AN end to the Wright hoax. We know that Man cannot fly."

Those were the instructions handed to the Dayton, Ohio, correspondent of a leading scientific paper back in 1909. Today, ironically for that journal, Dayton is the headquarters of the world's largest business, a business attesting to the fact that Man can fly: the Air Force Air Materiel Command (AMC).

It is almost impossible to comprehend the magnitude and scope of AMC's activities at first glance. For with each tick of the nation's defense clock, AMC will this year spend more than five hundred dollars, a total of $16.3 billion for the year. Its task is even larger than the one it faced in World War II. Last year's $16.5 billion was an all-time AF high.

This year's $16 billion is what AMC needs to perform its vital and complex mission: To buy, supply, and maintain the US Air Force throughout the world.

Under the command of Lt. Gen. Edwin W. Rawlings (see chart on following page), AMC has more than 175,000 civilian and military personnel assigned to it. It maintains shops, storage depots, and field offices throughout the world.

AMC's activity is world-spanning. It stocks and ships to a global network of air bases more than one million separate items or classes of equipment. Everything ranging from a B-36 to a technical manual on how to keep it flying. By comparison, America's largest mail order house stocks fewer than 200,000 items. For storing its ever-changing inventory, AMC needs and controls about 33,000,000 square feet of warehouse space.

Maintenance of AF equipment alone accounts for one of the largest jobs performed by AMC. Approximately 70,000 personnel—military and civilian—perform maintenance (overhauling and modernizing of existing equipment) and repair work on aircraft, engines, and thousands of miscellaneous items. To keep supply and maintenance up-to-date, the Command publishes 12,000 separate technical publications each year. The rate of repairs runs to about 46,000,000 items a month. And "repairs" means anything from changing a jet engine on a B-47 to changing a peanut-sized tube in that plane's radar set.

The complications besetting AMC when it goes shopping are many. It not only must write and supervise its contractual commitments with manufacturers, but conduct a constant probe of long-range manufacturing methods. Manpower and material shortages must be anticipated and prevented before they occur.

An example of AMC's long-range planning was its machine tool storage program. At the end of WW II the AMC mothballed some 35,000 critically short machine tools. Last year these were de-mothballed and distributed to defense industries, saving millions of man-hours that otherwise would have been needed to re-tool our industrial plant.

AMC is not alone concerned with the military build-up of the USAF. Through the Mutual Defense Assistance Program (MDAP), it helps to arm and maintain the arms of more than thirty friendly nations. Such opposite quarters of the globe as Thailand and Belgium are receiving aid—planes, parts, publications, goods, and services—from AMC.

The 27-year-old Air Materiel Command started as a division of the Army Air Corps. Site of its first headquarters was Dayton as it still is. Its original assignment was experimentation, research, production, procurement, storage, issue, maintenance, salvage, disposal, and industrial war plans.

During World War II it was split into two commands: Materiel (charged with procurement, research, and development) and Air Service (supply and maintenance). In 1914 the commands merged again to become the Air Technical Service Command. Two years later it was renamed the Air Materiel Command.

On April 1, 1951, AMC turned over its research and development responsibilities to the newly formed Air Research and Development Command with headquarters in Baltimore, Md.—END

The AIR MATERIEL COMMAND

Commanding General
Lt. Gen. Edwin W. Rawling

Deputy Commanding General
Maj. Gen. William H. Tunner

Asst. Deputy Commanding General
Brig. Gen. William T. Heffley

Deputy Commander for Production
Maj. Gen. Clarence S. Irvine

Asst. for Materiel Program Coordination
Col. Lawrence B. Ocamb

Executive
Col. L. J. Anderson

Comptroller
Maj. Gen. David H. Baker

Inspector General
Brig. Gen. Max F. Schneider

Quality Control
Col. Joe G. Schneider (actg.)

Mutual Security
Col. Leo P. Dahl

Judge Advocate
Col. Moody R. Tidwell, Jr.

Public Information Officer
Col. Erwin C. Morrison

Air Surgeon
Brig. Gen. Otis B. Schreyder

Director of Procurement and Production
Brig. Gen. Walter G. Bain

Director of Maintenance and Engineering
Maj. Gen. Carl A. Brandt

Director of Personnel and Support Operations
Brig. Gen. William J. Clinch

Director of Supply and Services
Maj. Gen. Lewis R. Parker

Deputy Director, Procurement and Production
Col. Beverly H. Warren

Deputy Director, Maintenance and Engineering
Brig. Gen. Walter W. Wise, Jr.

Deputy Director, Personnel and Support Operations
Col. Stephen C. Lombard

Deputy Director, Supply and Services
Brig. Gen. Frederick J. Dau

Field Operations Office
Col. Lee W. Fulton

Administration and Operations Office
Col. Bert S. Rosenbaum

Technical Services Division
Col. Norman C. Christensen

Plans and Programs Office
Lt. Col. Floyd Graham

Administration Office
Lt. Col. John F. Ward

Procedures and Field Operations Division
Col. Walter B. Packard

An **AIR FORCE** Magazine Chart

(Corrected as of April 1, 1953)

Plans and Programs Office
Col. Maurice S. Brandiet

Procurement Division
Brig. Gen. William P. Farnsworth

Office of Inspection
Lt. Col. William C. Robinson

Office of the Procurement Committee
Mr. Russell W. Burns

Production and Resources Division
Brig. Gen. Kern D. Metzger

Administration Office
Lt. Col. John H. Casenave, Jr.

Maintenance Production Division
Col. Keith W. Deeb

Maintenance Analysis Division
Col. Claire W. Bunch

Air Procurement Districts

Northeastern APD
Col. Leroy O. Lewis
14 Court Square
Boston, Mass.

Eastern APD
Maj. Gen. Kenneth E. Webber
655 Madison Ave.
New York, N.Y.

Southern APD
Col. William S. McDuffee
3309 Winthrop, PO Box 9858
Fort Worth, Tex.

Central APD
Brig. Gen. Russell Keiller
W. Warren Ave. and Lonyo Blvd.
Detroit, Mich.

Midcentral APD
Col. Robert L. Finkenstaedt
165 N. Canal St.
Chicago, Ill.

Western APD
Maj. Gen. William M. Morgan
155 W. Washington Blvd.
PO Box 2849, Terminal Annex
Los Angeles, Calif.

Air Materiel Areas

Middletown AMA
Maj. Gen. Lyman P. Whitten
Olmstead AFB, Pa.

Warren Robins AMA
Maj. Gen. Kingston E. Tibbets
Robins AFB, Ga.

Mobile AMA
Brig. Gen. Austin W. Mortenstein
Brookley AFB, Ala.

Oklahoma City AMA
Maj. Gen. Fred S. Borum
Tinker AFB, Okla.

San Antonio AMA
Maj. Gen. Clements McMullen
Kelly AFB, Tex.

Ogden AMA
Brig. Gen. Manning E. Tillery
Hill AFB, Utah

San Bernardino AMA
Maj. Gen. Edmund C. Langmead
Norton AFB, Calif.

Sacramento AMA
Maj. Gen. Arthur W. Vanaman
McClellan AFB, Calif.

Wright-Patterson AFB
Brig. Gen. C. Pratt Brown
Dayton, Ohio

Civilian Personnel Division
Col. Joseph W. Bowman

Operations and Training Division
Col. Edmund J. Baranski

Military Personnel Division
Lt. Col. George A. Simerol

Base Administration Division
Col. Louis A. Guenther

Air Installations Division
Col. Paul W. Stephens

Air Chaplain
Chaplain (Col.) Leonard C. Hubetz

Assistant for Equipment Authorization
Col. Marion G. Ferguson, Jr.

Transportation Division
Brig. Gen. James L. Riley

Materiel Control Division
Col. Edward C. Klein

Air Force Services Division
Col. Howard Moore (ret.)

Assistant for Mutual Security
Col. Joseph O. Fitzgerald

Programs and Requirements Division
Col. Darwin E. Ellett

Assistant for Special Weapons
Col. Harry C. Porter

Cataloging and Packaging Division
Col. William M. Miles

Winston Churchill speaking at MIT, March 21, 1949

LETTER FROM LONDON

'For good or ill, air mastery is today the supreme expression of military power, and fleets and armies . . . must accept a subordinate rank'—Winston Churchill

STRATEGIC bombers carrying air-to-ground guided missiles will form the decisive weapon in Britain's military arsenal in the future.

This significant fact is the logical outcome of high-level planning over the past two years, and of the technical development of aircraft and equipment since 1945.

It does not mean a violent upheaval within the three services nor any slacking off of effort in strengthening NATO, but it does signify the steady alteration of the roles of the Army, Navy, and Air Force during the next five years, and the crystallization of a project to keep Britain a major power within the framework of a limited and war-scarred economy.

The philosophy underlying this switch in British strategic thinking is perhaps best voiced in the words of the man who is probably most responsible for it. Winston Churchill, on March 21, 1949, said, in a speech at the Massachusetts Institute of Technology:

"For good or ill, air mastery is today the supreme expression of military power, and fleets, and armies, however necessary, must accept a subordinate rank."

Airpower as the supreme weapon is required by Britain for three reasons—(1) the nation wishes to remain a major power and this is the only way she can do it; (2) the Army and Navy can offer no long-term solution to the defense problem; and (3) keeping ahead in the aviation field is beginning to reap tremendous financial dividends vital to the country's economic position.

It must first be understood that strategic airpower does not entail the physical expansion of the RAF Bomber Command, and the introduction of large numbers of jet bombers of the same type as the Boeing B-47 Stratojet.

The offensive strength will come from a relatively small number of hand-built machines, virtually complete in themselves, and able to carry atomic and other guided bombs at altitudes and speeds that will make interception difficult. They will have electronics and fuel capacity sufficient to allow them to operate (as individual units if necessary) far into Soviet territory. A fleet of flight refueling tankers now under construction will still further extend their range.

At present there are no US strategic jet bombers in Europe, and the latest US bomber based in the UK is the B-50D. The Royal Air Force wants to make sure that specialized bombers, under its own command, will be available to strike at enemy targets, regardless of commitments which might draw US bombers to other theaters.

Air Chief Marshal Sir Guy Garrod summed up this reasoning in these words:

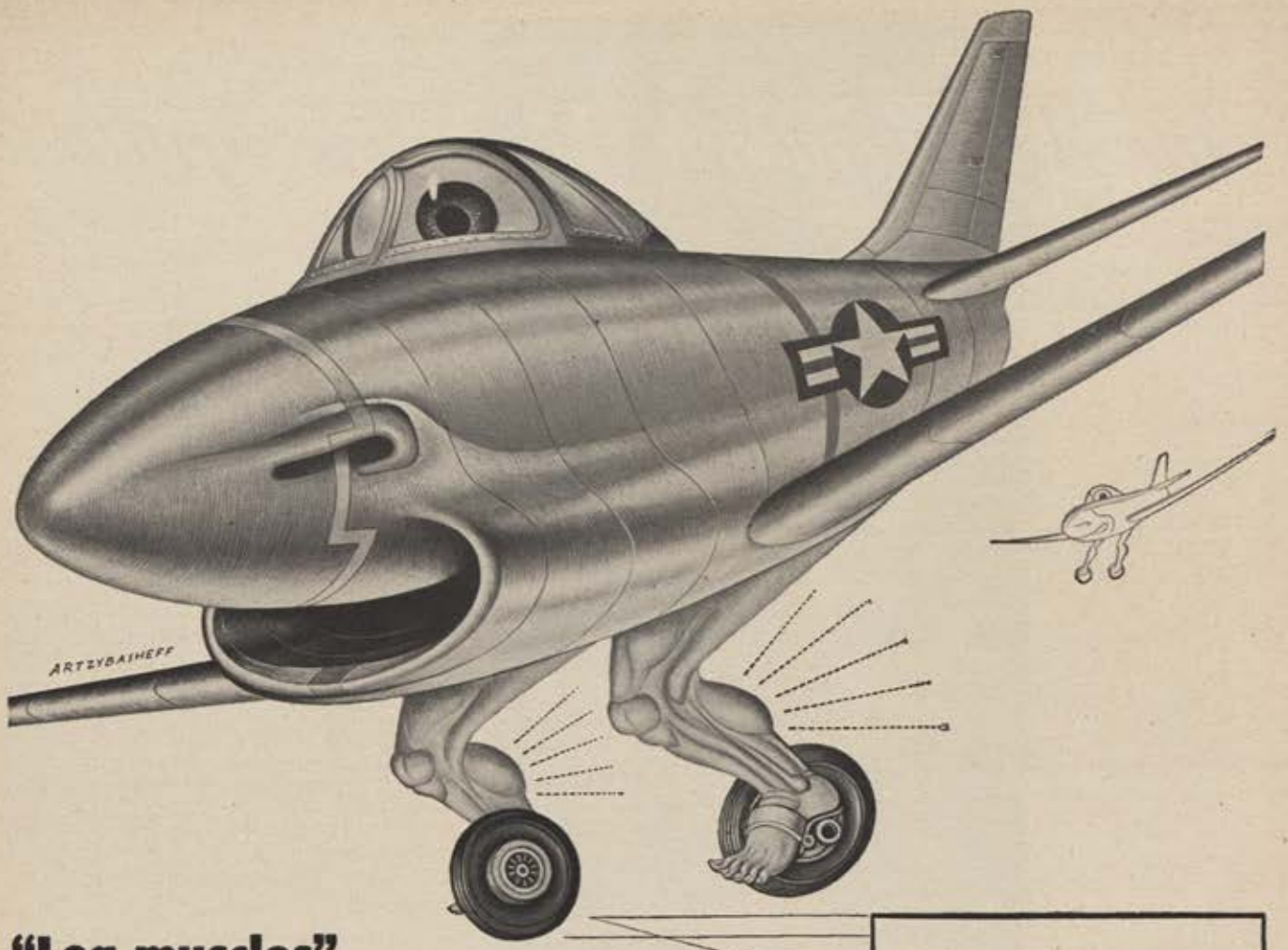
"We must not be drawn into hoping that some ally will provide the bombers. Without a bomber force under our control we cannot hope to defend ourselves."

Meanwhile, Britain will continue to fulfill to the utmost her obligations in many parts of the world, and perfect her new fighter defense system with sweptwing and delta types such as the Swift, Hunter, and Javelin.

Recent publication of the 1953 British White Paper on Defense confirms the strategic trend and gives broad reasons for it. The present situation is well summarized in a paragraph from the introduction:

"Our objectives have not changed; it is the means of

(Continued on page 49)



"Leg muscles" that cushion a jet's landing

When the landing gear of an F-86 Sabrejet hits the runway at lightning speed, the shock is absorbed by hydraulic action within the tough, precision-made cylinder on each "leg." To machine these 37-lb. cylinders to exact tolerances from solid 158-lb. steel forgings . . . to give them mirror-smooth inside finishes . . . Cleveland Pneumatic depends on Lycoming.

If *your* metal-working needs—like Cleveland Pneumatic's—can be solved by precision production, or if your problem is volume fabrication, or "just an idea" in the rough or blueprint stage—*look to Lycoming*. Long famous for metal-working skills, Lycoming meets the toughest specifications of exacting customers, both industrial and military.

Lycoming's 2½ million square feet of floor space, its more than 6,000 machine tools, and its wealth of creative engineering talent all stand ready to serve your needs.

AIR-COOLED ENGINES FOR AIRCRAFT AND INDUSTRIAL USES • PRECISION-AND-VOLUME MACHINE PARTS • STEEL-PLATE FABRICATION

FOR RESEARCH · FOR PRECISION PRODUCTION

LOOK TO LYCOMING

LYCOMING-SPENCER DIVISION, WILLIAMSPORT, PA.
BRIDGEPORT-LYCOMING DIVISION, STRATFORD, CONN.

For main leg cylinders that enable a Sabrejet to absorb the jolt of high-speed landings—Cleveland Pneumatic looks to Lycoming's precision production

Lycoming-Spencer Division
AVCO Manufacturing Corp.
652 Oliver Street
Williamsport, Pa.

Please send me further information on Lycoming's varied abilities and facilities.

Name_____

Firm_____ Title_____

Address_____

City_____ Zone____ State____

The Most Trusted Name in Ignition

in research, design and manufacturing

For over a quarter of a century, Bendix has set the pace in meeting the ever changing ignition problems of the industry. It is perfectly obvious that solutions to this perpetual challenge of product improvement and application can only be found by an unceasing search for advanced design, better materials and more efficient manufacturing methods.

How well Bendix has met this challenge is evidenced by the overwhelming endorsement the aviation industry has given to Bendix ignition equipment.

Whether the requirement is for a better electrical connector or a complete new ignition system, the industry has come to look upon Bendix as the one source best qualified to meet every ignition problem.

Remember, the unmatched facilities of Bendix are yours to command from planning to finished product.

AVIATION PRODUCTS

Low and high tension ignition systems for piston, jet, turbo-jet engines and rocket motors . . . ignition analyzers . . . radio shielding harness and noise filters . . . switches . . . booster coils . . . electrical connectors.

Bendix

SCINTILLA MAGNETO DIVISION

SIDNEY, NEW YORK

Export Sales: Bendix International Division
72 Fifth Avenue, New York 11, N. Y.

FACTORY BRANCH OFFICES: **117 E. Providencia Avenue, Burbank, California • Stephenson Building, 6560 Cass Avenue, Detroit 2, Michigan • Brouwer Building, 176 W. Wisconsin Avenue, Milwaukee, Wisconsin • 582 Market Street, San Francisco 4, California**

achieving them, and the rate at which we can progress towards their achievement to which the Government have given such close attention since they assumed office. [October 1951—The Editors.] In times of stringency it is especially important to get the fullest possible value for our money; we must avoid committing ourselves too deeply to equipment which will have to be replaced within a relatively short space of time; and we must balance the need for greater defensive strength against the risk that by overstraining ourselves too greatly we shall by economic collapse give the Communists a bloodless victory. It is on such considerations that the policy embodied in the defense budget for 1953/54 has been founded."

Naturally the British Army and Navy are not anxious to have prestige and appropriations reduced, but in the face of the threat from the East, and the parlous economic situation, they can do little else but bow to the inevitable.

While the Army, with its overseas commitments, is assured of a large slice of the budget, the Navy's role is contracting, as is its budget. Outbreaks of violence in the Suez Canal Zone and in Kenya have proved to the Army the value of air transport in getting men and materials where they are needed in the shortest possible time, and what is more they have found it just as cheap as sending them by sea! It will be a gradual process, but from now on the Army will become more mobile and will utilize jet transport aircraft to an ever-increasing degree.

First step has been taken with the ordering from Vickers-Armstrongs, Ltd., of a four-jet transport, the 150-seater Vickers V-1000. With this increase in the use of aircraft, the Army will rely more for its protection and transport on the RAF, and less on the Royal Navy. The Navy is slowly losing ground in money matters and in priority for equipment. While in 1953-54 the War Office grosses $1,627 million and the Air Ministry $1,334 million, the Navy's appropriation is only $1,020 million.

The Royal Air Force has not assumed the lead in the new British military policy by accident. It is through the determination and foresight of certain senior officers, and Ministry of Supply officials, combined with the technical skill of the industry.

To understand the situation fully, it is necessary to trace the development of the RAF step-by-step from the end of World War II. In 1945, demobilization began, and in a relatively short time the forces had been reduced to a bare handful.

During this period the RAF probably suffered more severe setbacks than either of the other services, as it was decreed that, while production of types then in use, such as the piston-engined Lincoln and Mosquito and the turbojet-powered Meteor and Vampire, would continue to meet the reduced requirements, there would be little chance of any new first-line types being built.

Fortunately a certain amount of money was still available for prototype development and general research, so that the industry was able to remain up-to-date in designing new machines.

Official specifications had been issued in 1945, before the cuts in armaments, for a high-altitude precision bomber with twin turbojets. This became known as the Canberra, and it is now in service in Bomber Command as a tactical light bomber, in large numbers. [The Canberra, called the B-57, is being built for the US Air Force by Glenn L. Martin.—The Editors.]

In 1946-47 Bomber Command decided to look well into the future, and plans were begun for high-altitude bombers to be fitted with the latest electronics and weapons, even the atomic bomb.

The specifications proved among the most difficult the industry had ever tackled. They required many times the load-carrying capacity of wartime types, well over double the top speed and altitude, and the incorporation of numerous new and untried devices. In addition these aircraft had to have low wing loading, docile handling qualities, and moderate landing speeds.

So radical was the conception that the manufacturers were forced to produce wing forms and designs not previously tested for an operational aircraft. Many experiments were made, and finally Handley Page adopted the crescent wing, and A. V. Roe the delta.

Engine builders rose to the occasion with high-thrust, low-consumption engines like the Avon, the Sapphire, the two-spool Olympus and the by-pass Conway. Plans were made for the electronics and radar equipment, although these latter suffered from lack of funds and official push. One further plane was ordered. This took the form of a conventional "guarantee" type with a straight wing, and has now emerged as the Short SA/4 experimental machine.

By 1948, as the Soviet Union's aggressive intentions manifested themselves in no uncertain manner, it was decided that, as the testing and building of the Handley Page and Avro jet bombers would be prolonged and exacting, orders would be placed for another bomber, the Vickers Valiant, which would have root-mounted Avon turbojets and a compound taper "flexibly hinged" wing.

Missiles were by then growing in importance and the experimental station at Woomera, Australia, had been started. In 1950, the Korean war had brought home the unmistakable and highly unpalatable fact that the cold war was rapidly becoming hot, and that the United Kingdom was in no position to meet the growing mass of men and jet aircraft in Eastern Europe.

Many orders were then placed for aircraft, but in such haste that many were of the wrong type. Obsolescent fighters were allotted big new orders, more piston-engined trainers were put in hand, and large batches of Canberra light bombers were demanded. Almost overnight materials became short, machine tools were not available, and the industry was expected to turn out aircraft in quantity with a manpower force almost too small to meet previous orders.

This then was the situation when the Conservative Government under Mr. Winston Churchill came into power in October 1951.

After assembling all the facts, the decision was taken to cut orders for some types, or extend deliveries over a longer period, and in order to speed the introduction of new equipment, the super-priority scheme was evolved, whereby firms building certain aircraft or missiles, or parts for them, could have first call on scarce materials, etc., and even get houses for their workers more quickly.

The original super-priority list consisted of the Hawker Hunter, Vickers Swift, English Electric Canberra, Gloster GA.5 Javelin, the Fairey Gannet, and of course guided missiles.

Even before the prototypes of the Avro Vulcan and the Handley Page Victor bombers had flown last year, a production order for both had been placed with the firms concerned, and, immediately after their debut, they were placed in the super-priority category.

With the gradual realization of the bomber plan and the improvement in the all-important missile situation, the Government has now begun to indicate how British airpower will develop. Britain sees no hope that the free world can match Russia numerically, but she has great confidence in its ability to maintain scientific leadership and weapons superiority, particularly in the air.

Derek H. Wood

Emblem symbolizes peace and war.

Changes IN THE AIR

The AF hopes its new policy that begins this spring will boost the number of ROTC cadets who request flight training

THE AIR Force has cut at least fifteen months from the active-duty tours of ROTC graduates who apply for flight training. Heretofore, ROTC graduates who wanted to take up flying when going on active duty had to sign up for three years, plus the time spent in flight training. The fifteen months required for flight training kept flying ROTC graduates on active duty at least four and a half years.

The Air Force hopes the new policy, which begins with this year's May and June graduates, will boost the number of ROTC students requesting flight training when they go on active duty following graduation.

Last year only twelve percent of ROTC graduates applied for flight training. This apathy is attributed by the Air Force primarily to two factors—a lack of emphasis by the Air Force on the advantages and opportunities of flying, and the four and a half years of active duty required of cadets who were willing to take a flying job in the Air Force. Steps have been taken to overcome both factors. ROTC summer camps this year will put more emphasis on the airplane than on anything else. PAS&Ts are conducting orientation flights for their students. Veteran Korean war pilots are touring ROTC units throughout the country, telling the cadets about their experiences at flying school and in combat, and the opportunities of a flying career.

Until Congress passed the Universal Military Training and Service Act in June 1951, ROTC graduates could "take it or leave it" when the Air Force offered them a job. UMT&S changed all this.

Under UMT&S, with but few exceptions, every male citizen of the United States between the ages of 18½ and 26 years has an eight-year military obligation. At least two of the eight years must be spent on active duty in one of the military services. The remainder must be spent in the Reserve. The more time the man spends on active duty, the less time he has to spend in the Reserve.

Since the passing of UMT&S, two schools of thought have been noted among AF-ROTC students. Some choose the "safe and easy" way to discharge their active duty obligation. Why not sign up for a job in supply or administration, take it easy for two years, and hurry home to a high-paying job in industry, they say. Other students have done a little research on the advantages of a flying job in the Air Force and were reasurred by what they learned.

Those who were led to believe, by all the talk of push-button warfare, that the pilot is not here to stay, were happy to learn that more than sixty percent if the officers in the Air Force must be pilots or air crew members for years to come. With ROTC designed to supply eighty percent of the officers needed, the Air Force feels that there is a lot of opportunity for the ROTC graduate who wants to fly.

The Air Force offers this comparison between the ROTC graduate who selects, say supply, when he goes on active duty, and the cadet who chooses flying. Take pay, for instance. The flyer draws one hundred dollars a month more than the supply officer. The flyer, who might have studied the same subjects in college as the supply officer, begins to learn another vocation—piloting. The Air Transport Association states that in 1952, US scheduled airlines employed 8,887 pilots and co-pilots. The Corporation Aircraft Owners Association says 3,000 business firms own and operate 10,000 planes to speed up their production and sales. The Civil Aeronautics Administration reports that there are 75,000 licensed private planes in the US. These figures indicate flying is big business.

The Air Force says there are many opportunities for a service pilot, opportunities which lead to advancement and more pay. There is also an educational advantage. During the fifteen months in which the pilot is learning to fly, he gets more schooling. He studies weather, meteorology, mechanics, code, radio and radar, and many other important subjects which can be put to good use when he returns to civilian life. This might be called post-graduate training.

For the pilot who feels he will be left behind by the supply officer going back to civilian life and a job in industry after only two years in the service, there is encouragement. The supply officer's starting salary may well be less than the pilot's $5,000 a year plus. While the supply officer is being promoted in his industry job, the pilot is advancing, both in rank and technical know-how.

Should the pilot decide to leave the service after four or five years, his additional schooling, training, and pilot skill could qualify him for an industry position comparable to the one the supply officer holds at the time. Should he choose a military career, his $5,000 and up salary, $10,000 insurance policy, free medical and dental care, and retirement benefits make for a pretty secure future, says the Air Force.

The officer who returns to civilian life after only two years of active duty must go into the Ready Reserve. If he participates in organized reserve training for three years, he can transfer to the Standby Reserve, in which he stays for three more years before completing his total military obligation. A Ready Reservist can be in-

By Ralph V. Whitener

voluntarily recalled to active duty during a national emergency declared by the President. A Standby Reservist can be recalled only in a time of war or national emergency declared by the Congress. This is in accordanee with the Armed Forces Reserve Act of 1952.

For each year the officer stays on active duty, in addition to the two years required by law, his Ready Reserve obligation is reduced in proportion. Should he serve five years on active duty, he can, upon leaving the service, go into the Standby Reserve, in which he will stay for three years, completing his military obligation.

Whether today's ROTC graduate chooses the short or the long active duty tour, or is a supply officer or a pilot, Gen. Jimmy Doolittle's advice to the '51 ROTC graduates still seems appropriate (AIR FORCE, June '51). He said, "A young man just entering the Air Force should objectively analyze his attributes and his desires in order to determine how, in his chosen profession, he can best serve his God and his fellow man. After deciding on his objective in life he should direct his destiny, through planning, study, and training, to the achievement of that objective."

Let's see what the '54 ROTC student can expect when he returns to college this fall. Perhaps it should first be pointed out that he may pursue his college education to completion without interference from the draft, if he has signed a paper agreeing to the following:

(1) To accept an Air Force Reserve commission, if tendered, and serve on active duty for at least two years following graduation;

(2) To remain a member of a regular or reserve component until the eighth anniversary of his commission. This is required by UMT&S.

The first change he will notice will be the new Air Force textbooks. Some twenty new titles will be available at the opening of the fall school term, with eleven more to follow in 1954. The new books are designed to support the new generalized curriculum of the AF-ROTC. Officials, claiming that air science has social and cultural significance in addition to military, want the new curriculum subject matter to approach traditional college courses in geography, problem solving, management, and communication, as they relate to the military.

College officials will welcome the new textbooks. Many have long felt that ROTC subjects were inadequate, and that the cadet's time was consumed in dull memorizing of detailed facts. Some professors claim that ROTC has emphasized "know how" to the neglect of "know why."

The '54 ROTC student will also find a whole new series of training aids. Film transparencies, mock-ups, models, charts, and graphs are among the devices being developed to train the cadets in the practical application of air science.

If the 83d Congress passes the Reserve Officers Training Corps Act, which has been in committee for some time, an entirely new phase of training will be injected into the ROTC program. For the first time, flying training will be offered right on the campus. Actual flight instruction will be handled on a contract basis with approved operators or university flight schools, and will meet CAA standards. The student will receive a private pilot's license when he completes the course. He will also receive from fifty to sixty dollars commutation a month and up to $600 annually toward his tuition and fees. This will no doubt be much more attractive than the twenty-seven dollar commutation ROTC students now receive.

Phase one of the Air Force's basic flight instruction program will be the type of flight training on the campus. By giving this training to ROTC students, the Air Force expects two dividends. The presence of planes and the offer of a pilot's license should attract many cadets to flying careers, and the Air Force will train its pilots considerably more cheaply and about five weeks faster.

Whether a college student is among this year's ROTC graduates, or will enroll for the first time this fall, this seems to be the time for him to stop and analyze his situation. We have, in effect, a universal military training program in force today. Every physically fit male between the ages of nineteen and twenty-six will no doubt experience military service. If our young people resent the thought of active duty, even ROTC training, perhaps this statement by George Washington will offer some consolation: "Every citizen who enjoys the protection of a free government owes his personal services to the defense of it."

With nations throughout the world racing for military supremacy, no longer can we put our military training on a temporary or emergency basis. We must make room for it in our daily pursuits. We must embrace it, not evade it. The security of our nation is the responsibility of all who share its freedom. As Bernard Baruch has said, "Do your duty in all things. You cannot do more. You would not wish to do less."—END

AF-ROTC SUMMER ENCAMPMENTS—HOW AND WHERE

About 17,000 AF-ROTC cadets from 209 universities and colleges throughout the US, Hawaii, and Puerto Rico will attend ROTC summer camp at sixty-one air bases, beginning June 22. This will be the first summer camp under the jurisdiction of the Air University, since it took over ROTC from ConAC last year. The camp will consist of a sixteen-hour processing and orientation period, and a 188-hour training program. Some 700 AF officers and 450 airmen, currently members of ROTC Detachment staffs, will also attend the camps to supervise the cadets and determine their ratings at the end of training. Instructors will be AF officers and airmen stationed at the bases where the camps are held (see below), whose duty assignments are in the phases covered by the ROTC camp training program.

ALABAMA: Brookley, Craig, and Maxwell Air Force Bases
ARIZONA: Luke, Williams
CALIFORNIA: Castle, George, Hamilton, Long Beach Municipal, March, Mather, McClellan
COLORADO: Lowry
FLORIDA: Eglin, MacDill, Tyndall
GEORGIA: Lawson, Moody, Robins, Turner
ILLINOIS: Chanute, Scott
LOUISIANA: Alexandria, Barksdale
MASSACHUSETTS: Otis, Westover
MICHIGAN: Selfridge
MISSISSIPPI: Greenville, Kessler
NEVADA: Nellis
NEW JERSEY: McGuire
NEW MEXICO: Walker
NEW YORK: Griffis, Mitchel, Stewart
OHIO: Wright-Patterson
OKLAHOMA: Vance
SOUTH CAROLINA: Donaldson, Shaw
TENNESSEE: Sewart
TEXAS: Biggs, Bryan, James Connally, Ellington, Foster, Goodfellow, Harlington, Kelly, Laredo, Perrin, Randolph, Reese, San Marcos, Sheppard, Webb
UTAH: Hill
VERMONT: Ethan Allen
VIRGINIA: Langley
WASHINGTON: Fairchild, Larson, McChord

You can buy experience

● Probably the outstanding characteristic of Twin Coach Aircraft Division plants is the wide *aircraft* experience of its personnel. This experience extends to all levels of the organization—from executive . . . through supervision . . . to production.

This means that prime contractors can entrust tooling design and construction to Twin . . . can rely on Twin's producing assemblies to specification, in quantity, *on time*. Modern facilities, modern equipment and *experienced* manpower make Twin Coach a dependable source for every type of major airframe assembly.

A-7275

● **202 YEARS OF AIRCRAFT EXPERIENCE AT WORK...at Twin Coach**

1. *John Cudmore* 27 years
2. *Stanley Lesinski* 38 years
3. *Stephen Chojnacki* 38 years
4. *John Lee* 36 years
5. *John Mattison* 25 years
6. *Harry Schaefer* 38 years

FAGEOL TWIN COACH AIRCRAFT

TWIN COACH COMPANY *Aircraft Division* **BUFFALO, N. Y.**

TWIN COACH PRODUCTS:

AIRCRAFT ASSEMBLIES • MOTOR COACHES • TROLLEY COACHES • SUPER FREIGHTER CARGO TRUCKS • FAGEOL GASOLINE AND PROPANE ENGINES • FAGEOL-LEYLAND DIESEL ENGINES

TECH TALK

By Richard Skinner

You're out of step with progress if you're still draining fuel tanks into fifty-gallon drums in order to measure tank capacity and set gauges accurately. That's doing it the hard way, with all the dangers of explosion, rain, dust, and calibration errors, say Kaiser-Frazer engineers. K-F has hit on a new automatic metering device that pumps fuel directly into a tank truck. Built-in meters clock gallons by weight and volume, and a compensator allows for variations in density caused by weather. And no fuel is exposed to fire or pollution. The unit, a portable cart with arc-proof integral pump and motor, can be used anywhere and in all weather.

They take blimps pretty much for granted in Akron, Ohio, where Goodyear turns them out in quantity. But a recent flight that didn't go unnoticed was the initial flight test of the ZP2N, world's largest non-rigid airship. The first production model, sixteen feet longer than the 324-foot ZPN-1 delivered to the Navy last year, stayed aloft for forty-two minutes with a crew of thirteen Goodyear personnel.

Ever take a good, close look at a bolt? They're not commonplace anymore. Take one that's going into a B-47, for example—it even gets a screen test. In fact, it's measured, concentricity-tested, hardness-tested, screen-tested, Magnafluxed, demagnetized, and anodized before being OK'ed. In the screen test, the bolt's shadow is projected on a screen to permit measurement of the angle between the head and shank. Magnaflux, with ultra-violet light, reveals any defects inside, while a hot bath in an anodizing tub makes friend bolt corrosive-resistant. And only then is it ready to join the 14,697 other bolts and rivets in a single B-47 wing.

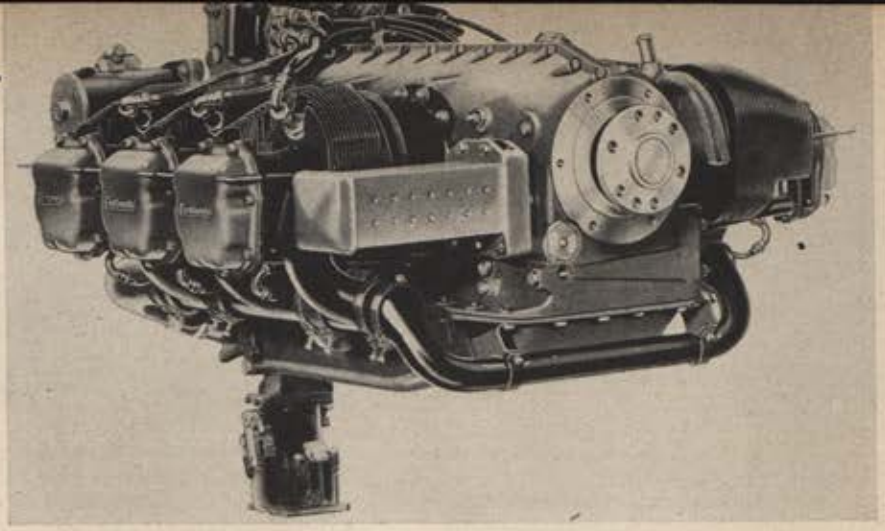
There's an odd assortment of aircraft slated to vie for the $28,000 top prize in the England-to-New Zealand air race next October. Of the nineteen entries to date, seven are jets and five of these are British. The 12,135-mile race is run in two sections, speed and transport. Three British twin-jet Canberras and a four-jet Vickers Valiant will be after the speed crown, and a Vickers Viscount turboprop transport is listed for the second division. The US has three entries for speed (a Spitfire, a deHavilland Hornet, and a Twin Mustang) and two in the other (a Lockheed Lodestar and a Custer Channel Wing "Executive"). Other contestants are from Australia, New Zealand, Denmark, and Holland.

An alloy used with some success by the Japanese during World War II has become the basis for a new "soft" magnetic material composed of non-critical metals that has been developed by the Naval Ordnance Laboratory. Known as 16-Alfenol, the material is sixteen percent aluminum and eighty-four percent iron. With properties superior to silicon iron, it'll be especially useful in transformer cores, the Navy says.

No more dishpan hands for Air Force KPs? On order for use in mess halls are cotton gloves coated with vinyl plastic, said to be snag-proof and acid- and oil-resistant. Now at one AF base of our acquaintance, they make a chile con carne that would *really* be a test.

GAPA Test Missile

Knowledge Boeing gained from its GAPA research missile program (1945 to 1949) is now going into an advanced missile project. More than 100 of the 1,500-mph test vehicles were fired. Above, one readied at Alamogordo, N. M.



Compact Design

First of Continental Motors' new O-470 series to reach production is the "A" model, above, which powers the Cessna 180. External oil lines have been done away with entirely. A full flow type oil filter and accessory drives are inside the crankcase for additional compactness.

AF Survival Suit

A Sabrejet pilot in Korea tries out the AF's new rubber immersion suit. Neck, wrist, and ankle bands keep water out if a pilot should jump into the drink. The 20-pound outfit, tailored to each pilot, has a quilted inner suit plus outer covering and gloves and boots attached, and can be worn on top of a G-suit.

Honeywell Equipment for CF-100s

New models of Canada's twin-jet CF-100 will have Minneapolis-Honeywell automatic control equipment, including systems for yaw axis control, fuel measurement, and rocket temperature. The plane packs 60 rockets in wing-tip pods.

Bound for Korea

A Navy plane able to make some kind of showing in MIG Alley may be on its way to Korea soon. A unit of FJ-2 Furies, carrier version of the F-86, is being readied on the West Coast for Far Eastern duty, the Navy has announced. This North American swept-wing fighter is in the "more than 650 mph" class. It has four 20mm cannon. Note the familiar Sabrejet nose and fuselage. FJ-2s are being made at North American's Columbus, Ohio, plant.

MISSION ACCOMPLISHED

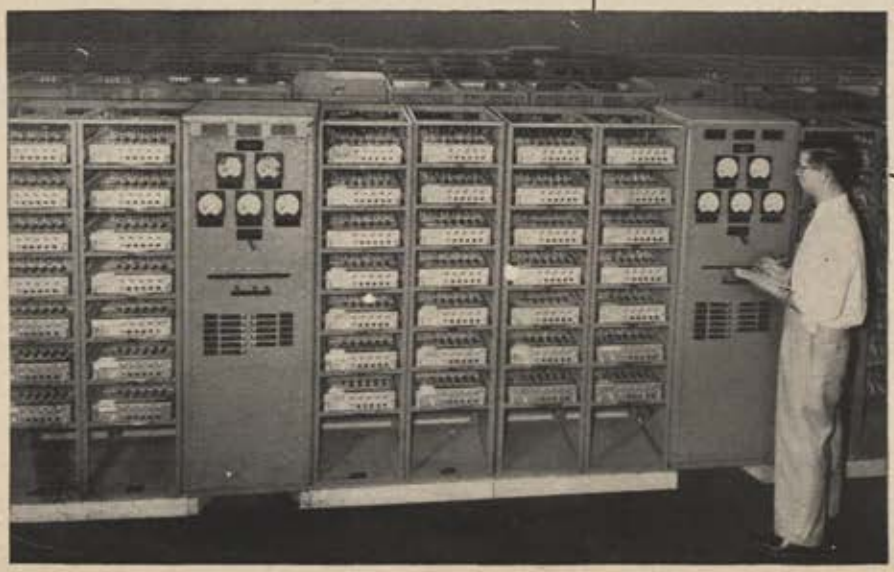
"United Press Photo"

But ...without Reliable Electronics it would have been an Abort!

... and Reliability in electronics can result only from excellence in design, manufacture, inspection, and testing methods.

The DuKane Corporation maintains a vacuum tube "proving ground" which provides a constant flow of tubes for the assembly lines of one airborne project at their plant. This "proving ground" constantly ages 10,000 tubes by a process of simultaneous vibration and full power operation before they are subjected to a close-limits inspection. This is only one way DuKane assures greater "Reliability" in electronics.

If your service has a classified project or a prime contractor has a project where electronic "Reliability" is the number one factor, take advantage of DuKane's thirty years of experience and established manufacturing facilities. Let our technical men discuss it with you.



DuKane
CORPORATION
ESTABLISHED AS "OPERADIO" 1922
ST. CHARLES, ILLINOIS

Aeroproducts reports...

AEROPROPS KEEP GOING DESPITE SEVERE FLAK DAMAGE

OFFICIAL U. S. NAVY PHOTO

Lieutenant (jg) Robert C. Notz, USN, inspects the Aeroprop blade that brought him safely back from a North Korean target. Flying from fast carrier Task Force 77, Lt. Notz' AD fighter-bomber was hit by Red flak during a low level attack. A bite approximately 18 inches long was taken out of the trailing edge of the blade deep into the rib section. The blade remained intact and enabled him to reach a repair base. A new Aeroprop blade was installed without removing the propeller and the ship was returned immediately to combat.

OFFICIAL U. S. NAVY PHOTO

Now Lieutenant Commander Lynn DuTemple knows why his AD *Skymaster* raised such a howl when he brought it aboard the USS *Princeton* off Korea. A 37mm enemy anti-aircraft shell had torn a gaping hole completely through one blade of his Aeroprop. LCdr DuTemple had just completed his fourth bombing run on Hamhung railroad bridge when the flak ripped through his prop blade and shattered his canopy. The pierced Aeroprop blade did not alter its performance enough to reveal the damage until the plane had reached its carrier base.

THESE INSTANCES OF COMBAT DAMAGE EXEMPLIFY THE DURABILITY OF AEROPROPS . . . THE METICULOUS ENGINEERING AND CAREFUL FABRICATION OF ALL AEROPRODUCTS PROPELLER EQUIPMENT. THIS SAME SERVICE . . . AND THE "VISIONEERING" FOR AIRCRAFT OF THE FUTURE . . . ARE AVAILABLE TO ASSIST YOU WITH ANY PROPELLER PROBLEM IN THE SUBSONIC, TRANSONIC OR SUPERSONIC RANGES.

Building for today... Designing for tomorrow

Aeroproducts

ALLISON DIVISION • GENERAL MOTORS CORPORATION • DAYTON, OHIO

New Rocket Rack

Launched from a rack that snaps back inside the fuselage a split second after firing (see AIR FORCE, January 1953), each of the twenty-four Mighty Mouse 2.75 rockets of North American's F-86D is capable of knocking down the biggest enemy bomber. Each rocket's punch is that of a 75mm shell. This new version of the Sabre is the AF's only one-man, all-weather interceptor. The plane holds the world's speed record—698.5 mph. It has more electronic gear than an average TV station.

Canned Engines for AF

Assigned, sealed, and ready for delivery. Workmen (below) of the Chevrolet Aviation Engine Division, Tonawanda, N. Y., bolt metal shells containing Wright-designed aircraft engines to railroad flatcars for delivery to airframe manufacturers or for overseas replacement. The shells are large enough to include a complete engine assembly. They are constructed in two flanged halves, which are bolted together, and sealed with a rubber gasket. Each shell is pressurized, five pounds per square inch, with filtered, dried air. This makes it possible to toss the shells over the side of a cargo ship and either tow or float them ashore. Eight of the shells can be carried aboard a flatcar. They can be reused.

Slower Comedown

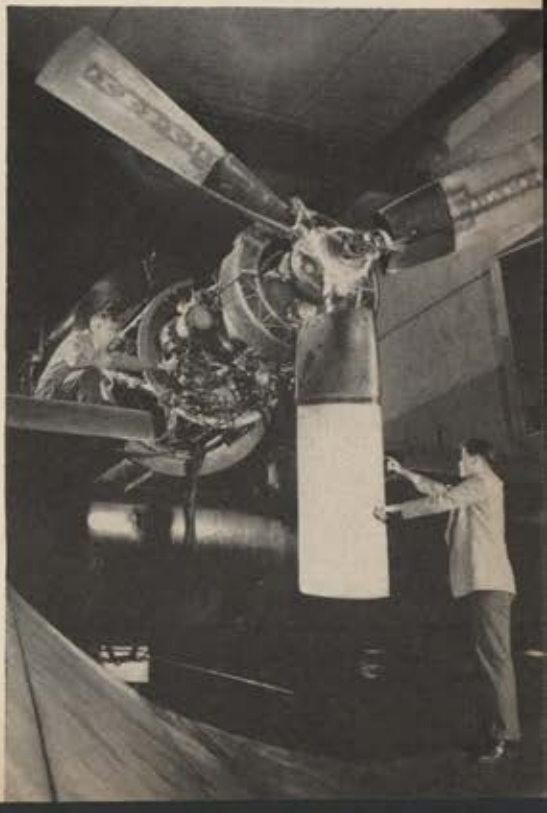
A new non-oscillating parachute, with flaps to insure better stability, has been designed and tested by the Wright Air Development Center, Dayton, Ohio. The flaps, WADC explains, will also check a jumper's rate of descent and reduce opening shock. The chute, which can be used at speeds bettering 400 mph, will be manufactured by Pioneer Parachute Co., of Manchester, Conn.

Powerplant by Fairchild

Pictured (above, right) is the J-44, a turbojet of Fairchild design. It's the buzziness end of the Ryan Q-2 Firebee (above, left). A pilotless drone, the Firebee can simulate aerobatics of piloted aircraft and will be used by Air Force, Army, and Navy for target practice. The recently unveiled J-44 is a compact powerplant, six feet long, less than a foot in diameter, and weighs 300 pounds. It develops 1,000-lb. thrust and can be used in jet-assisted take-off. The engine is typified by its monocoque structure, with an outer shell carrying the main stresses.

Widest Bladed Prop

The new wide-bladed prop—widest blades ever made—will be used on the Navy's R7V-2—turboprop version of Lockheed's Super Constellation transport. Now in production, the prop can, by varying the number of blades, be adapted to engines of more than 9,000 hp. The prop is made of hollow steel with a steel-core center; air space between is filled with vulcanized sponge for support. Hamilton Standard, designer, says increased width means more thrust.



YOU WOULDN'T KNOW AN ENGINE WAS RUNNING 300 FEET AWAY FROM THIS RAM JET STAND

UNITED AIRCRAFT in East Hartford runs this laboratory for ram jet testing so quietly that its operation can scarcely be heard at a distance of 100 yards. Maxim Silencers, 19 in all, effectively silence exhaust and intake of engines, compressors, and ram jet exhaust. For the solution to unusual silencing problems, consult Maxim, the company unequalled in silencing experience.

Consult

MAXIM

THE MAXIM SILENCER COMPANY
103 HOMESTEAD AVE., HARTFORD 1, CONN.

Gentlemen: Please send me more information on jet engine silencing.

NAME _____

COMPANY _____

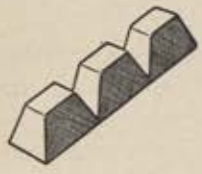
ADDRESS _____

_____

8MX53

Boeing B-47 Stratojet Bomber

What it takes to keep a B-47 in the "wild blue yonder"!



Tens of thousands of pounds of Aluminum

+

Hundreds of thousands of feet of Wiring

+

Hundreds of thousands of Separate Parts

+

Thousands of feet of Tubing

+

Tens of thousands of Machine Operation Hours

This new queen of the skies makes flight look easy. But it's not as simple as it looks . . . many thousands of complex parts have to be produced, assembled and fitted to make this picture of flying perfection possible.

American Machine & Foundry Company manufactures important mechanisms for the B-47 without which such vital systems as the Landing Gear, Steering and Wing de-icing could not operate.

Here is another instance where AMF helps to do a job essential to our defense effort. AMF is qualified to tackle this important task by virtue of its sound knowledge of manufacturing techniques, skilled specialists, ample plant facilities and proficient management.

AMF is pleased to make its contribution for defense —pleased to be one of hundreds of companies helping to "keep 'em flyin' ".

AMERICAN MACHINE & FOUNDRY COMPANY

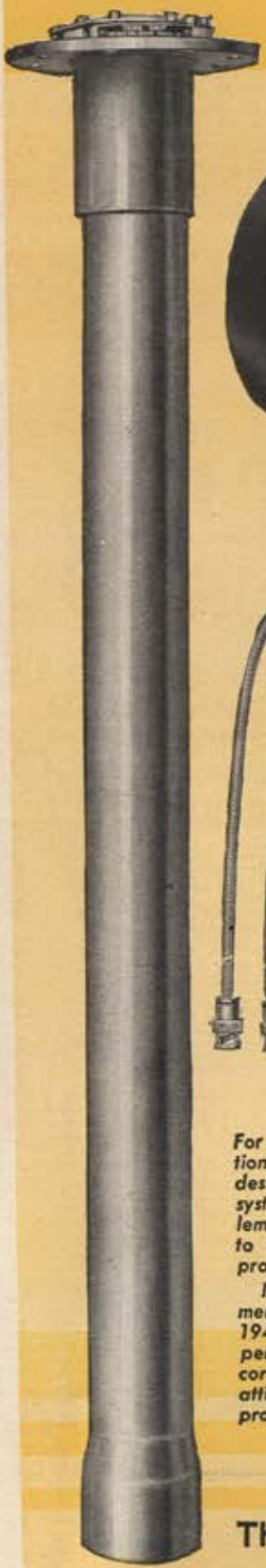
Executive Offices, 511 Fifth Avenue, New York 17, N. Y.

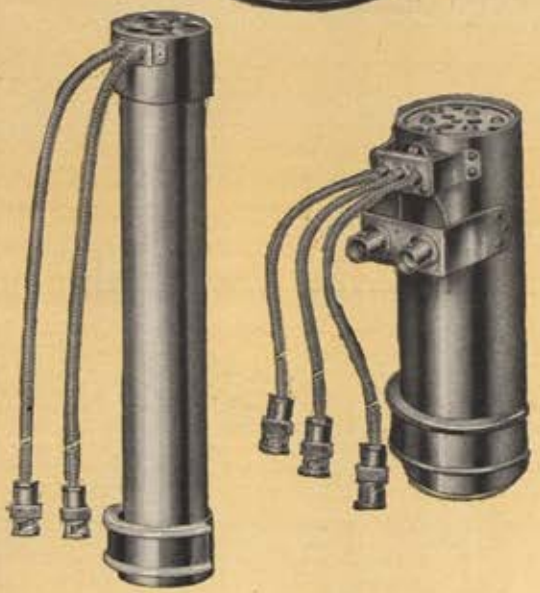
AMF does it better—automatically!

CREATORS AND PRODUCERS OF ELECTRONIC AND MECHANICAL EQUIPMENT FOR THE ARMED SERVICES: Radar antennae and drive units • automatic loaders for Army and Navy weapons • elevating and azimuth mechanisms • cooling fans for Army tanks • airplane parts • mobile ovens • electronic training devices • naval ordnance • rolled and welded steel products • shell components • silver-zinc batteries • special military projects.

LIQUIDOMETER Gravimetric and Volumetric Liquid Measuring Systems

Capacitor Type





Liquidometer capacitor type fuel quantity measuring systems feature the simplest and most fundamentally straight-forward circuits.

These systems can provide individual indication or totalizing of fuel volume or weight, low level warning, fuel transfer switching, airplane center of gravity control and other auxiliary functions.

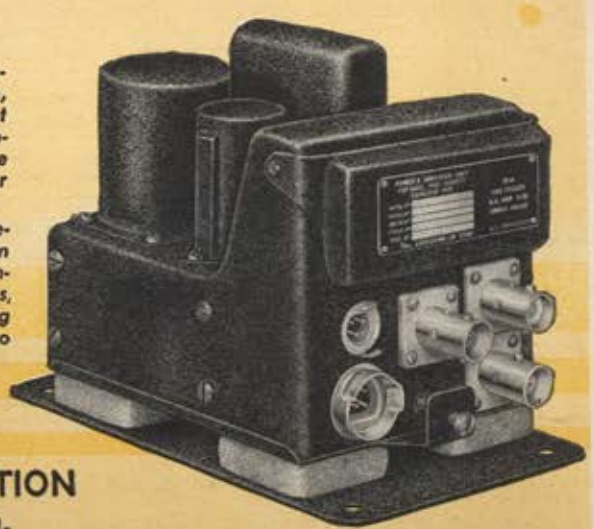
One type measures the weight of fuel based on an assumed relationship between its density and its dielectric constant. Another type is independent of fuel dielectric constant and is the only system which really gives "true" fuel weight indication. This type automatically combines the volume as measured by tank units and a dielectric reference condenser, with density as measured by a Liquidensitometer. An uncompensated type is also available.

If desired, Liquidometer fuel weight measuring systems can be arranged to provide volumetric "full' tank indication, regardless of the type fuel or its temperature. This feature is of material benefit during ground or airborne refueling operations.

Indicators, power units and tank units are rugged, compact and are of lightweight construction. They combine the features of sound progressive engineering, expert workmanship and best quality materials.

For more than three decades The Liquidometer Corporation has concentrated almost exclusively on the research, design and manufacture of liquid quantity measurement systems and the attendant installation and service problems. This specialization has proved to be of great value to the aircraft industry which has used Liquidometer products exclusively since 1929.

In the capacitance method of fuel quantity measurement Liquidometer started extensive research back in 1940. It was the first to recognize such needs as compensation for fuel dielectric and density differences, correction for variations in fuel levels caused by varying attitudes of aircraft, and tank unit characterization to provide uniformly spaced indicator graduations.



THE LIQUIDOMETER CORPORATION

Long Island City 1, New York

MOBILIZATION NEWS

BY JAKE CULPEPPER

NEW UNIFORM ALLOWANCE regulations have been approved for reserve officers. In general, payments will include: (a) Initial Uniform Allowance—not more than $200 to be paid after January 1, 1953, under certain conditions such as first reporting for AD for period over ninety days and after completing certain periods of active and inactive duty. This payment is barred by the previous payment of an initial uniform allowance under any other law. (b) Active Duty Allowance—not more than $100 to officers entering AD for more than ninety days when two years elapse between periods of AD. Payment is retroactive to those officers who entered AD on or after June 25, 1950. (c) Maintenance Allowance—not more than $50 for each four years of satisfactory service in reserve component which must include at least twenty-eight days of AD training. Extended periods of AD for ninety days or more are not considered in figuring the four years. This provision is retroactive to July 9, 1952.

AF-ROTC — Non-vet AF-ROTC students graduating this month and next who are commissioned in AF Reserve will be ordered into active service thirty to 120 days after graduating and receiving commissions. Most of these officers will report to orientation sites picked by major commands. Such officers with vet status who request active duty will probably go directly to duty stations. . . . Total of 392 medical students of this year's AF-ROTC crop will be appointed AF Reserve officers. Of these, 224 are studying medicine and surgery; 105, dentistry; 20, pharmacy; and 43, veterinary medicine.

RECALL — During April, ConAC ordered to voluntary AD 550 pilots for refresher training. AF is expected to extend this program through FY '54. . . . Total of 988 airmen with reserve commissions were recalled to voluntary AD during the period July 1, 1952, through February 19, 1953. Of this group, 154 held mobilization assignments or designations. From March 1, 1953, to April 30, 1953, AF recalled 258 rated and non-rated officers from airman status or from among Reservists who were mobilization assignees or designees. These included 102 pilots, eighteen observers, and 138 non-rated officers in selected skills.

PERMANENT COMMISSIONS - Reserve officers whose term appointments expire after April 1, 1953, will soon receive a second offer of an indefinite (permanent) appointment and a third offer 120 days prior to end of their current term appointments. This applies to those who have not yet replied to the first offer or who declined it. . . . Fifty-three general officers have accepted reserve commissions.

ASSIGNMENTS — Temporarily physically disqualified Reservists are now assigned to the Ineligible Reserve Section when they are unable to perform assigned reserve duties. . . . Officers released from EAD with temporary appointments in grade higher than their permanent reserve grades can receive pay for and participate in an AF reserve component in their permanent reserve grade only. . . . Reserve officers on EAD now are eligible for duty assignments as air instructors with ANG.

POLICY — The rule requiring that sixty percent of Reserves in a pay status "must be present at a training assembly in order for the officer members to collect pay" has been lifted for benefit of those assigned to Specialist Training Centers. . . . Airmen discharged after February 28, 1953, now have ninety days during which they may re-enlist in permanent grade held at time of separation. This applies also to Reservists and Air Guardsmen who have served an AD tour and are otherwise eligible.

ANGuard ANGLES

Maj. Allan R. Scholin

IT'S GOING to be a busy summer for ANG maintenance crews.

With little prospect of receiving many combat-type planes before the summer camp season gets under way late next month, ANG squadrons in the US will have to pool their fighters at the eight training sites so there'll be enough planes for each wing during each 15-day stay.

This means that most squadrons will do without their fighter planes for the entire summer camp period, running from late June until early September—except, of course, during their own encampments.

° ° °

No one at the National Guard Bureau is anxious to talk about the plane shortage, but indications are there'll be only from 300 to 400 fighter planes available in the ANG by summer training time.

Divide that figure by eight and you'll come up with the number available at each training site. It means squadrons will have to alternate in use of the planes, which puts a bigger load than usual on maintenance crews. They'll probably be working 'round the clock.

° ° °

There's likely to be some pooling of maintenance personnel, too, particularly to fill out ground crew strength of wings still in the process of reorganizing. Air technicians of wings permanently based at training sites will make up part of the shortage, but technicians of other nearby units may also be held over if necessary.

° ° °

Other summer training notes: Kansas' 127th Squadron, whose plans weren't firm last month, will go to Casper, Wyo., with its parent wing, Oklahoma's 137th, July 5 to 19. . . . Delaware's 142d Squadron will stay at New Castle, Del., instead of joining other squadrons of the 113th (D. C.) wing at Spaatz Field, Reading, Pa., July 25-August 8. The USAF outfit based at New Castle has invited the 142d's pilots to check out in its jets during the training period. They'll have no plane problems.

° ° °

Wick trimmings: Maj. Gen. Earl Ricks, acting chief of the NGB, says he'll visit every unit during summer training. The former Arkansas AG, first air officer to run the Bureau, is an eager pilot. . . . An increase in number of ANG squadrons may be authorized soon. Depends on whether or not AFR units build to strength. . . . NGB accepted a few F-84Bs offered by USAF—but not for flying. Too many maintenance headaches, too few spares. They'll be made available for ANG ground crew training. . . . Col. Willard Millikan, C. O. of D. C.'s 113th Wing, has had many letters on his article "The Air Guard's Coming Back," in the March issue of AIR FORCE. See this issue's Air Mail for some reactions. . . . Two Puerto Rico ANG pilots racked up 420 missions between them during WW II. Lt. Col. Alberto A. Nido, C. O. of P. R.'s 178th Fighter Squadron, logged 170 including some with the RAF in the Battle of Britain. Maj. Mihiel Gilormini, ops officer, is credited with 250 with RAF and USAF. . . . Any toppers in the Guard?

° ° °

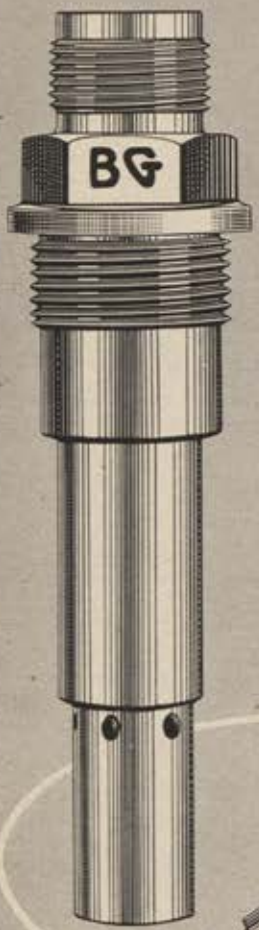
Last month we reported that Alaska's 144th Fighter-Bomber Squadron would hold its "summer" camp in November. We're told they're busy during the summer entertaining tourists, coining money, and just plain living. November, the sourdoughs say, is a slack work month, and besides they're eager for some winter training. NGB adds another slant. Units can't go to camp until the fifth month after activation; the Alaska squadron won't be activated until about July 1.

° ° °

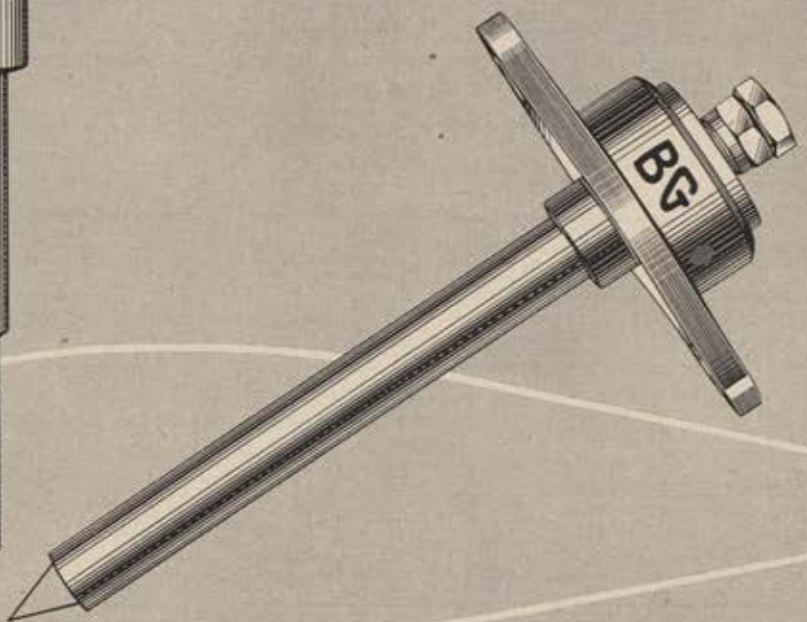
We'd like to have news items from ANG units. Write me in care of AIR FORCE magazine, 1424 K Street, N. W., Washington 5, D. C.

By Al Scholin

Dependability by BG



Exceptional performance under the most rugged combat conditions is provided by BG gas turbine igniters and thermocouples. Meeting the specific requirements of gas turbine engine manufacturers and the Armed Services, readily accessible for economical maintenance, BG igniters and thermocouples are the choice of engineering and maintenance personnel.



AEROJET

AiResearch

Allison

BOEING

CURTISS-WRIGHT

Eclipse-Pioneer

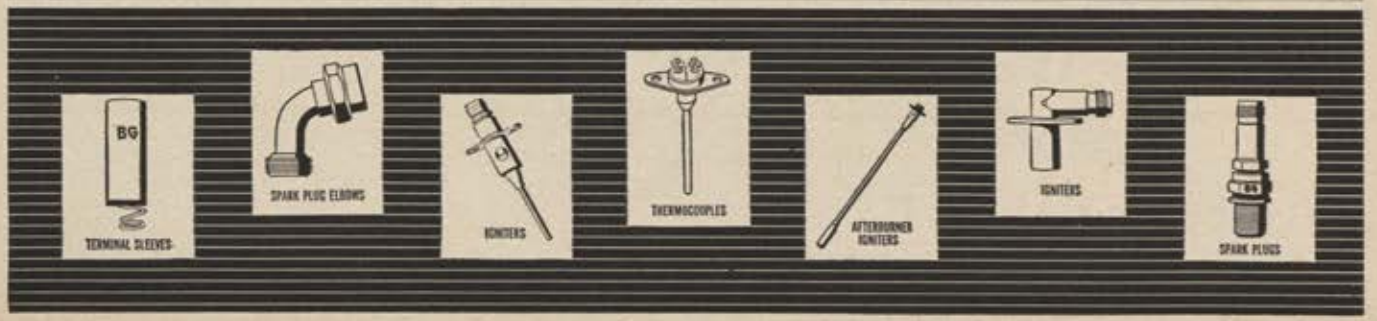
marquardt

REACTION MOTORS, INC.

For information on these and other BG products write to

THE BG CORPORATION

136 West 52nd Street
New York 19, N. Y.



What JACK & HEINTZ *is doing about...*

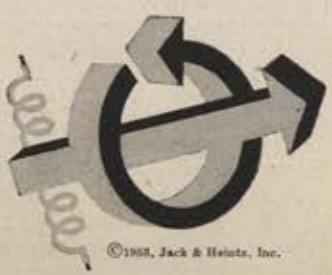
COMPLEXITY

Converting a baffling jigsaw puzzle of scattered electrical controls, protective devices and miles of wiring into one easily serviced, plug-in panel no larger than a table radio . . . Jack & Heintz is helping to solve the serious problem of aircraft complexity.

Complexity is just one of the problems we face in *our business* of developing and producing complicated, lightweight, high-output electrical, electromechanical and hydraulic devices . . . designed to meet extreme conditions of stress, temperature and environment.

The name *Jack & Heintz* on aviation or commercial products stands for advanced engineering . . . precise manufacturing . . . pretested performance. Write Jack & Heintz, Inc., Dept. 550, Cleveland 1, Ohio.

JACK & HEINTZ
Rotomotive
EQUIPMENT



means electrical, hydraulic or mechanical devices designed to solve unusual problems of developing power, controlling it or using it.

Aircraft Generating Equipment—a-c and d-c—including Control Systems and Components • Electric Starters • Actuators and Special Aircraft Motors • Custom-built Commercial Motors • J&H Eisemann Magnetos

THE SCOOP ON THOSE DIRECTIVES!

Ever wonder what path that long and involved directive has taken before emerging as an innoxious mass of generalities?

Did you ever wonder where all those directives came from? You did? Well, here for the first time is the inside story.

First comes the order, "Let's get something out on this," given by the Chief . . . a man accustomed to command.

Then comes the deadline, often called the suspense date. The deadline is usually too soon because the directive is usually too late.

Next occurs a rather confusing period during which a game not unlike musical chairs is played with in-baskets. This is known as "delegating authority or fixing responsibility for the rough draft."

After the dust has settled one or more unhappy Indians, also known as Peasants or Peons, crank up their word factory and the ponderous mechanism of the world's mightiest Air Force shows how it got that way.

The Indians know how the General feels on the subject so they throw in a piece of the General's Feeling. They are on pretty safe ground because this is known as the "ungarbled word." Now the Colonel has some Definite Convictions that are at slight variance with the General's Feelings. At this point solid footing gives way with a sudden lurch. To an Indian who believes in AFRs and the Officer's handbook, the way is clear. It's the Colonel, however, who handles such things—if you'll pardon the expression—as effectiveness reports and fat-cat deals. The Indian destined for bigger and better things realizes all this and throws in a piece of the Colonel's Definite Convictions. And some fine day, shortly after the suspense date, the rough draft is ready.

The next stop is known as coordination. In this phase the background is filled in so completely that the foreground has to go underground. This is usually accompanied by loud wails and anguished outcries.

The story has a happy ending . . . the final directive is a comfortable mass of generalities that offends no one.

Maj. John Aldinger
Patrick AFB, Fla.

Career Program Gripe

I am another recently discharged airman who joins the growing chorus of disgusted airmen both in and out of the service who are fed up with Air Force inefficiency, mass malassignment (AIR FORCE, March 1953), and mass mismanagement.

I feel I can speak with some authority as I had over nine years of both active and reserve service. I saw all of the mismanagement and malassignment from the Training Command to the major command I was assigned in. If it existed in that major command, I am quite sure it existed in all major commands from the Pentagon on down.

First thought you will ponder is, why did this fellow quit with so much service? The main reasons are mentioned above but to go into more detail, it is the Career Program which to my way of thinking has wasted billions of tax dollars annually since it was inaugurated. True, every job is outlined in fancy prose in regulation manuals, but it is not working on the line and in the offices. The old Military Occupation Specialty (MOS) system was better in every way. For one thing there was less than half the paper work to go through, a saving of millions of dollars in paper alone. Secondly, thousands of fellows were dealt malassignments in the change-over to the present inefficient system. I know since I was one of them. For example, when I was called before the board for the change-over, I had had over 2½ years experience as an Aircraft and Engine Mechanic, but it seems I had just completed the A&E school three or four months before I met the board so was classified as, yes, you guessed it, an apprentice. When an experienced man is shoved down instead of up, is there any further reason why he should stay in?

Secondly, the Career Program did away with efficient organization. In World War II when a man joined a unit he was with the same officers and enlisted men practically until discharge. This led to greater teamwork among the men of all ranks and for deep and lasting friendships to form. Under the present system you don't know who your buddies are, as they shift around from unit to unit in less than three months' time. That brings greater inefficiency and no teamwork and no chance for any friendships to form. This, I believe, is one of the underlying factors in the recent plane crashes. This is also one of the reasons for low morale throughout the Air Force. For how can you trust anyone if he isn't around long enough to know! This is also one of the most important factors that discouraged me from reenlisting, as I well realize the financial benefits of military service.

Thirdly, I have another criticism of the Career Program. Why is it that men who have held one rank for, say, seven or eight years do not get promoted because they are 28 to 35 years old, while some kid fresh out of high schools makes staff sergeant is less than two years' time? Do you call that fair? I certainly don't and that also discouraged my reenlistment. The older men who are more efficient and more used to the ways of the military service are kept down. For instance, I knew men who had been staff sergeants for seven years who were held down purposely so a kid eighteen years old could become of equal grade in eighteen months' time. Even though the test program was recently initiated, this same deficiency still exists. This wastes tax dollars because the older men who are well trained soon leave the service, and the Air Force and the nation lose all that training and efficiency. This also applies in the many cases of flying officers who leave the service for the exact same reason.

W. L. M., Jr.
Rochester, N. Y.

LET'S HAVE YOUR JET BLAST

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

Southerner's Reply

In our March issue of AIR FORCE, a "joker," who calls himself An American Airman, wrote an article entitled, "Mass Malassignment." Well, maybe he has his troubles and reasons for writing such a disgusting article, but item nine (9) in his lists of complaints could have been justly omitted.

He suggested, and I quote: "Let's give commissions to men who are sincere. And, let us realize, as far as ROTC commissions are concerned, that northern schools are definitely more than equal to those of the south."

Having been born in the great state of Virginia, naturally, I wonder how an American airman (former school teacher in Illinois at that), could make such a grossly stupid statement as this.

Obviously, this "joker" has never been out of the north, nor has he been a student of American history. So for his information, I shall name a few military schools of the south. Surely he has heard of V.M.I., V.P.I., The Citadel, Clemson, Georgia Tech, Auburn, and I could go on with other ROTC schools of the south too numerous to mention. These colleges and universities of the south have produced many fine officers.

I should also like to refresh the memory of this disgruntled airman, about a distinguished southerner named Robert E. Lee. Although our greatest genius of modern military history was West Point trained, he was, nevertheless, a product of the south. General Lee was also the President of Washington and Lee University, another of the fine military schools of the south.

It was my good fortune to serve with

(Continued on following page)

the USAF during World War II and I did my flying and fighting with some damn good "Yankees" and "Rebs" too, but *together* we won the victory.

I trust that this "joker" who signed his article An American Airman, will take stock of himself before he writes any more prejudiced, distorted "crap" about his Air Force or our South. And while in the Air Force, if he performs his job well, and is really qualified, I believe he will get his commission as he wishes.

As for me, I am what one could call a "Southern-Yankee," for I am now in the North employed at "Jet Center USA," helping to produce the best jet engines for the world's greatest Air Force.

My best wishes to this "sad sack" airman.

Lew Wright
Cincinnati, Ohio

P. S. It's rough for those airmen in Korea, too, fellow, even with commissions.

Selective Recruiting

I have just finished reading "Jet Blasts" in your March 1953 issue and the section titled "Mass Malassignment" is interesting for a starter. The same applies to the article in the November 1952 issue titled "A Reservist Sounds Off." Both of these articles are from unhappy people and I fail to see where they have offered any specific ways to correct the causes of their dissatisfactions. I would like to offer a sound program for reducing these dissatisfactions. Please note I use the term "reducing." No single program will satisfy all people, but some programs are much better than others and I think this is one of these.

This plan has a title—simply this: "Selective Recruiting." This term applies to both commissioned or enlisted personnel. For this discussion I am thinking primarily of the enlisted personnel.

The Airman Career Program contains the machinery for accomplishing this program so there is nothing entirely new to create. However, I do recommend that a different application of the ACP be implemented.

First, there is the Airman Aptitude Battery. This is a series of tests that when tabulated indicate in what Career Field the testee would make the most successful progress, both to himself and to the USAF.

Recruiters could administer these tests and send the completed answer sheets to the Indoctrination Division for scoring, thus protecting the integrity of the test. The Indoctrination Division would return the results of the examination to the recruiter, who could then talk to each of the testees individually and by applying the principles of Paragraphs 4 and 5 AFR 35-390, dated July 9, 1952,

(Continued on page 69)

Testing controls for a jet engine that doesn't exist—yet

Question:

How is it possible to design automatic controls for a jet engine that's still under development—hundreds of miles away?

Answer:

Through the combined facilities of the new Honeywell Jet Engine Control Laboratory and Honeywell's analog computing equipment.

The controls are set up on the test bench shown here and receive the mechanical equivalent of electrical signals sent from the remotely located analog computer acting as engine simulator. In response, the automatic controls operate actuators which control fuel flow and open and close a simulated tail cone or exhaust nozzle.

These procedures make possible tests in engine operating regimes not attainable in the average test cell utilizing an actual engine. This means that the effects of altitude, flight speed, and inlet temperature can all be evaluated over their entire range. In addition, the control test program is greatly accelerated because the delays resulting from mechanical difficulties normally encountered in running experimental engine test programs are eliminated.

In this way prototype models of controls, designed by Honeywell on the basis of known characteristics of a jet engine still under development, are given tough, practical testing. Thus, they can be ready when the engine comes out of design.

It's another "first" for Honeywell—and we expect there will be others, too. Because automatic controls are essential to aviation progress. And automatic control is Honeywell's business.

MINNEAPOLIS
Honeywell

H HONEYWELL *Aeronautical Controls*

We may have to

STRETCH

a bit...

...but we'll fill your order, and fill it fast. For here at Clary, we combine a huge stock of bonded AN and NAS hardware with an experienced staff eager to pitch in and help you. That's why you save time by calling Clary first.

Clary
MULTIPLIER CORP.

AIRCRAFT HARDWARE DIVISION

Serving the Aircraft Industry Since 1941

For complete information, Write, Wire or Phone
AIRCRAFT HARDWARE DIVISION, 425 E. 54th St., Los Angeles 11, Calif.
ADams 3-6271 • Cable Address: CLARYMULT • TWX LA 116

tell them what the service had to offer.

The Service in this instance could be defined as The Department of Defense. Since the recruiters are working together, it would be possible to pool the known requirements of each of the three Departments and thus recruit the man or woman for a specific duty assignment in each Department. Take a look at civilian industry—does any business hire stenographers when he only needs drill press operators?

An important point of this discussion is that one of our most important resources, namely, "manpower," could be conserved by placing people in the service that could best utilize their natural skills with the minimum amount of formal training.

The main point is that the prospective recruit would be told not only which service could best use him, but in what occupational field that service could best use him, and all of this before he decided to sign the enlistment contract. If he did not like what he was told, he could then take his chances with the Selective Service Board.

AC&A Officer

F/O Training

I wish to draw your attention to the fact that no provision has been established for reservist-training of ex-flight officers.

The government expended a fortune training each flyer over the average time of 1½-2½ years—as compared to three months' period for OCS. Now, in America's most crucial period, regulations have been enacted whereby both commissioned and enlisted ranks might maintain a "minute-man" proficiency in their particular specialties—with no consideration for persons of my rank.

The wartime mismanagement of the procedure, as developed, for awarding the ranks of flight officers and second lieutenants, is vividly portrayed by the fact that the former rank has been discontinued. Anyone intimately connected with it can vouch for the demoralizing inconsistency of the resulting appointments. In my "sixty-man" flight, the majority were appointed flight officers, while the adjacent flight had only four. Yet, there is no provision for a present-day survey of individuals, who held this rank, for commission qualifications. At the same time such a survey, if enacted, would have drawn upon talents already developed, thus salvaging some of the funds spent on their training.

For my personal part in this, I was offered a commission (I have a letter from my former commanding officer substantiating), but decided to leave the service in order to obtain an education. Because of the above, however, I cannot fulfill my obligation as an American in these precarious times.

Ronald L. Hudson
Los Angeles, California

AMERICAN CHEMICAL PAINT COMPANY

AMBLER CHEMICALS ACP PROCESSES PENNA.

Technical Service Data Sheet
Subject: Protecting Aluminum with "*ALODINE*"®

INTRODUCTION

Aluminum not only corrodes when exposed unpainted to the atmosphere (particularly in moist, salt-laden air or industrial fumes) but also sheds paint unless the surface is actually changed prior to finishing. Simple treatments involving cleaning, or etching, or both, which heretofore have been used extensively, do not change the chemical composition of the surface and are inadequate. Far from retarding the corrosion of unpainted aluminum, such processes may in fact stimulate it.

In general, coatings integral with the aluminum itself have proved to be far more effective than cleaning and etching treatments for bonding paint and protecting the metal. "Alodine", which forms a stable, durable, non-metallic surface on aluminum, anchors the paint finish, prolongs paint life, and protects aluminum exposed unpainted in moist and salt-laden atmospheres.

CHARACTERISTICS OF THE "ALODINE" COATING	
TYPE	Non-metallic surface, integral with aluminum it protects.
COLOR	Depending on alloy treated, color range is from an iridescent blue-green to a dark slate grey.
THICKNESS	From 0.01 to 0.08 mil. No appreciable dimensional changes occur when aluminum is Alodized.
WEIGHT	50 to 300 mgs. per square foot. Optimum: 100 to 200 mgs. per square foot.
SOLUBILITY	Insoluble in water, alcohol, solvents, etc. Insoluble in most dilute acids and alkalis. However, strong acids and alkalis which attack aluminum may penetrate the "Alodine" film and react with the underlying metal. Slightly soluble in concentrated nitric acid. Soluble in molten sodium nitrate, etc.
ELECTRICAL RESISTANCE	High diaelectrical resistance.
HEAT STABILITY	Unimpaired at temperatures that melt aluminum.
FLEXIBILITY	Integral with and as flexible as the aluminum itself. Can withstand moderate draws.
ABRASION RESISTANCE	Approximately 90% of that provided by chromic acid anodized aluminum.
SALT SPRAY	Painted—superior to chromic acid anodizing. Unpainted—comparable with chromic acid anodizing.
PAINT-BONDING	Excellent. Equal to or superior to anodizing.
TOXICITY	Non-toxic.
BIMETALLIC CORROSION RESISTANCE	Shows good resistance against bimetallic or galvanic corrosion.

ALODIZING IS EASY AND EFFECTIVE

The Alodizing process is a chemical one and does not require electrolytic techniques or equipment. Alodizing is simple, foolproof, low in cost, and requires a minimum of equipment. Essentially, the process consists of the following easily controlled operations or steps:

1. Cleaning the work.
2. Rinsing the cleaned aluminum surfaces.
3. Coating with "Alodine."
4. Rinsing with clean water.
5. Rinsing with warm "Deoxylyte" (acidulated rinse).
6. Drying.

After treatments. Alodized aluminum provides an ideal bonding surface for paint, wax, adhesive, or other organic finishes. These should be applied in accordance with the manufacturer's directions. Unpainted or exposed areas will be protected by the tough, durable "Alodine" surface.

"ALODINE" MEETS SERVICE SPECIFICATIONS

"Alodine" applied by immersion or spray complies with the rigid performance requirements of both industrial and Government specifications. The following is a list of Service Specifications which "Alodine" meets at the present time.

MIL-C-5541	U. S. Navord O.S. 675
MIL-S-5002	16E4 (SHIPS)
AN-F-20	AN-C-170 (See MIL-C-5541)

U.S.A. 72-53 (See AN-F-20)

BRUSH "ALODINE" PROTECTS ALUMINUM IN THE FIELD, SHOP, OR HANGAR

Brush "Alodine" is easily applied in a simple brush-on or flow coat process to large assemblies and surfaces—airplanes, trucks, trailers, boats, housing, building siding, railway cars, bridges, etc.—that are too bulky or too remote to be conveniently treated in tanks or a multi-stage power spray washer. The cleaning and coating chemicals for Brush Alodizing are shipped in bulk or in the convenient Brush "Alodine" Chemical Kit No. 1. This Kit contains enough chemicals to treat about 1,000 square feet of surface and is an ideal package for use at airfields of commercial airlines or of the Armed Services anywhere.

CHEMICALS ACP PROCESSES

WRITE FOR FURTHER INFORMATION ON "ALODINE" AND ON YOUR OWN ALUMINUM PROTECTION PROBLEMS.

CHEMICALS ACP PROCESSES

Where? Right here. For Intelligence's S/Sgt. Phillip Menroy, Windoffer pinpoints the spot . . . While at right Wingman 2d Lt. Fellman handily explains "here's how."

YOU'VE GOT TO PROVE IT!

Debriefing and gun-camera films confirm pilot's claim of MIG-15 kill in Korea

THAT SILVER band miles and minutes ahead at twelve o'clock low and thirty-five thousand feet down is the Yalu. Beyond is Manchuria—"off limits" to Capt. Robert Windoffer and Wingman 2d Lt. Walter Fellman, Jr., F-86 pilots patrolling MIG Alley.

Somewhere below six MIG-15 pilots have left their sanctuary and are "tooling" around in the same subfreezing atmosphere as Windoffer and Fellman. The job of the Sabre pilots, find 'em, destroy 'em, and then. . . .

Prove it!

Windoffer spots 'em. The odds are better than usual (three to one). Protected by Fellman from a rearward attack, he bores in. Second-lasting bursts from .50 calibers and the MIG's afire. The pilot bails out. The pilotless MIG is still flying—apart. There's nothing for Windoffer to do but fly on through the debris.

The other MIG pilots have had enough and head for home. Likewise Windoffer and Fellman. There's no question about this "kill." True. But Air Force Intelligence doesn't have *one* question. It has many.

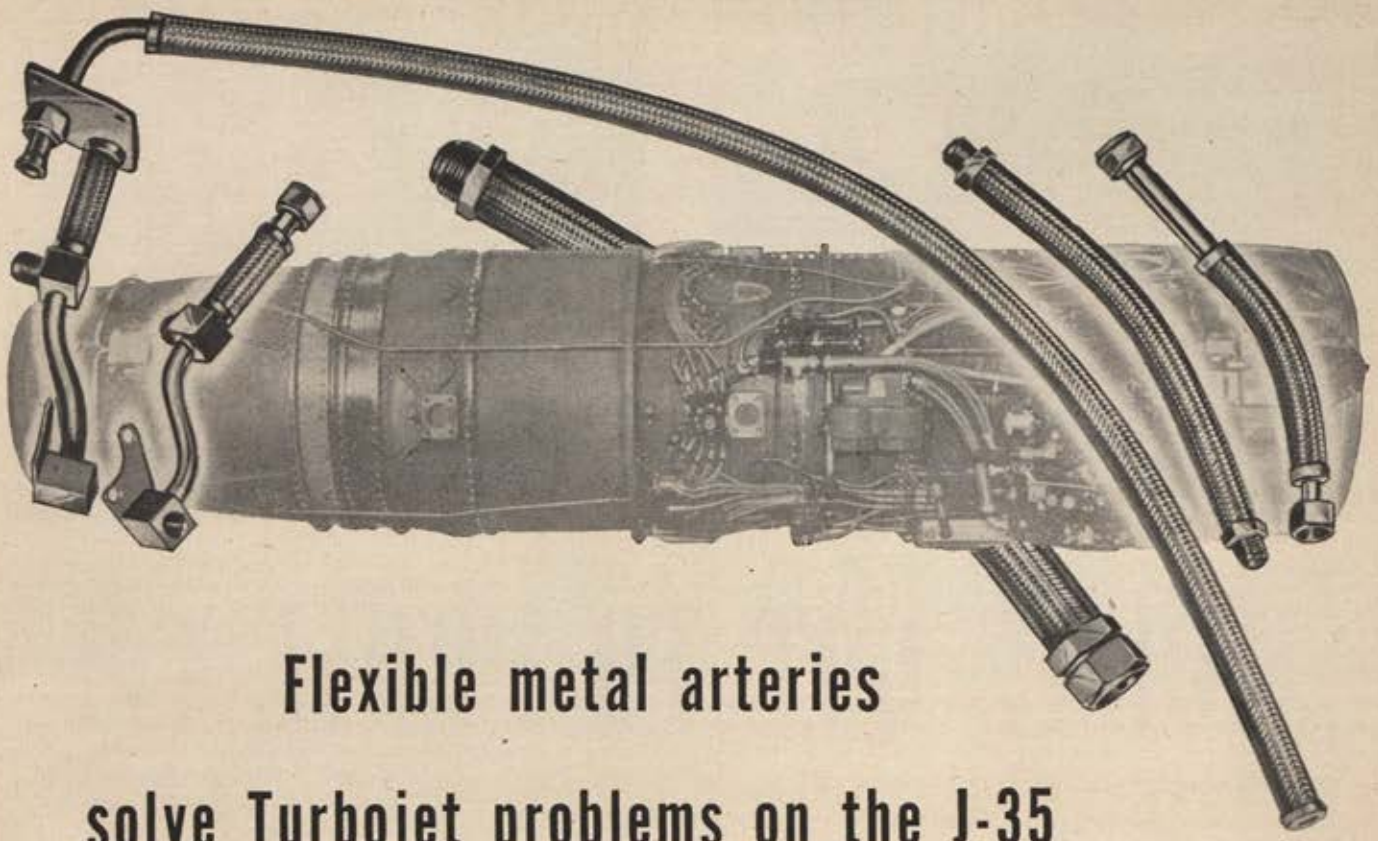
Back at their Korean flight strip Windoffer and Fellman face a barrage at debriefing. Where? What time? How? Did you have a gun camera?

At this point the gesticulating eloquence of a pilot's hands re-fly the mission, re-fight the battle. Any intelligent Air Force intelligence officer should know by the pantomime what occurred. They do, but. . . .

Film cartridges are removed from cameras and taken to the projection room. There in un-Hollywood-like austerity the rushes are shown. There's the MIG twisting and turning, trying to hide from the boring stare of Windoffer's gunsight. And then the screen seems to rip asunder as the camera shows the MIG exploding.

The answers to questions and the infallible eye of the camera are in accord. Windoffer's "kill" is now officially a kill. And the Fifth Air Force in Korea can accurately report in its communiques that the 12-to-1 ratio of F-86 victories over MIG-15s continues.—END

Look't that! Windoffer grits teeth, re-lives his miles-high battle with MIG (exploding below) over North Korea. With him are Fellman and A/1C Kenneth J. Corpening.



Flexible metal arteries

solve Turbojet problems on the J-35

One of the primary problems in developing the J-35 for production was the development of fuel, oil and air lines to meet today's jet engine requirements. The metal hose had to meet complex configurations of a critical nature and still withstand excessive changes of temperature, high pressures, and unusual vibrations. Other important considerations were close tolerances, ease and speed of installation.

Rigid tubing was unwieldy; configuration couldn't be predicted on the drawing board; mass production was difficult; maintenance costly and complicated.

Because of the intricate nature of the problem, the metal hose lines had to be assembled on mock-up forms. This required flexible-hose engineers, a competent experimental shop, and advanced knowledge of aviation metal hose requirements.

Turbojet designers found the help and the metal hose they needed at Titeflex.

Our long experience with ignition shielding, fuel and oil lines and other aircraft applications enables us to design and construct flexible metal hose and fittings that meet the toughest jet requirements. (In fact, Titeflex was one of the first to qualify in this field!)

Today, Titeflex furnishes a majority of flexible metal hose assemblies for jets. Titeflex research continues to develop new designs of metal hose to take care of the higher temperatures, pressures, and new applications in the jet planes of tomorrow. Our experience and many of our techniques also apply to non-aviation problems. Perhaps yours is one of them. Write us about it today.

Let Our Family of Products Help Yours

Titeflex

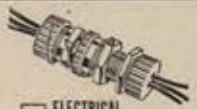
✓ Check products you are interested in.

☐ SEAMED AND SEAMLESS METAL HOSE

☐ PRECISION BELLOWS

☐ IGNITION HARNESS

☐ IGNITION SHIELDING



☐ ELECTRICAL CONNECTORS

☐ RIGID AND FLEXIBLE WAVE GUIDES

☐ FILTERS

☐ FUSES

TITEFLEX, INC.
510 Frelinghuysen Ave.
Newark 5, N. J.

MAIL COUPON TODAY

Please send me without cost information about the products checked at the left.

NAME_____

TITLE_____

FIRM_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

'53 CONVENTION OFFICIALS NAMED

Three national officers head '53 convention committees. Early reservations indicate a high attendance in Capital

Samuel M. Hecht, president of the Hecht Company, East Coast department store chain, has been named by AFA President Kelly to be general chairman of the 1953 national convention. Hecht was a pilot in the Air Force during World War II, and served overseas in the CBI. He is a charter member of AFA and a member of the national Board of Directors. He has been active in AFA affairs in the Baltimore area, where he resides, since the early days of the Association.

Hecht has selected George D. Hardy, AFA Central East Regional Vice President, as vice chairman of the convention committee.

Harold C. Stuart, Board Chairman of AFA, was named to head the Convention Host Committee. He will be in charge of guest activities and arrangements.

More than 100 volunteers will work on the nineteen sub-committees set up to plan and stage the convention. William F. Mullally of St. Louis has been named parliamentarian for the business sessions. He is a national Director.

Plans are being completed to make the regular convention functions the most enjoyable yet held. The functions include the Reunion Cocktail Party, Airpower Ball, Airmen's Brunch, and the Airpower Banquet. About 1,600 persons are expected to attend the Banquet and Ball. Two orchestras and special entertainers will make the Ball the most colorful in AFA's history. August in Washington will be comfortable for AFA's convention delegates and guests. The entire headquarters hotel is air-conditioned. Plan now to attend the year's most colorful aviation gathering.

An Anniversary Theme

AFA's '53 convention in Washington, D. C., August 20-23, will highlight the 50th anniversary of powered flight. This year also marks the 46th anniversary of the Air Force. Speeches, functions, and decorations at the convention will stress the historic achievements during the past half century of aviation.

Jimmy Doolittle, AFA's first president, is chairman of the national committee planning the Golden Anniversary Observance. Arthur Kelly, AFA president, is a member of the committee.

Old friends meet at AFA convention.

Reunions Planned

Plans are already under way for reunions of ten Air Force outfits at this year's AFA national convention in Washington. Hundreds of former and present members of the Air Force travel to the AFA convention each year to renew their service friendships. Some of these reunions are heartwarming. For instance, the two men in the photograph above, met for the first time in six years at the AFA convention. If you would like to have a reunion of your outfit this year, write AFA Headquarters, 1424 K Street, N. W., Washington 5, D. C.

RESERVE YOUR ROOM EARLY FOR THE CONVENTION AND REUNION

CONVENTION HEADQUARTERS—STATLER HOTEL

Three famous Washington hotels have been reserved for AFA's 1953 Convention. They are the Statler, which will be Convention Headquarters, the Mayflower, and the Ambassador. AFA will not operate a housing bureau for the Convention. Delegates and Guests should request accommodations directly from the hotel of their first choice. A first and second choice of hotels should be listed.

HOTELS RESERVING ROOMS FOR AFA CONVENTION

Rates	Single Room	Double Room	Twin Room
Statler	$7.00-15.00	$10.50-15.00	$11.00-17.00
Mayflower	6.50-16.50	12.50-18.50	13.00-19.50
Ambassador	5.00- 9.00	7.50-10.50	8.50-12.00

Suites: 1 Bed/Rm.: 23.00-37.50 2 Bed/Rm.: 36.00-55.50

AIR FORCE ASSOCIATION CONVENTION ROOM RESERVATION REQUEST FORM
August 20-21-22-23, 1953

(Please Print)

NAME_____

ADDRESS_____

CITY_____ STATE_____

ARRIVAL DATE_____ HOUR_____

DEPARTURE DATE_____ HOUR_____

NAME OF PERSON(S) SHARING ROOM:

_____

_____

MAIL DIRECTLY TO:

Reservations Manager
(Name of hotel of first choice)
Washington, D. C.

(Please list two choices of hotels)

CHOICE: HOTEL DESIRED:

First_____

Second_____

TYPE ROOM DESIRED

☐ Single ☐ Double ☐ Twin

☐ Suite—Number of Bedrooms_____

Desired rate per day: $_____*

*Room available at rate nearest that requested will be assigned.

COAST WELCOMES LEADING JET ACE

AFA's Los Angeles Group stages homecoming for Royal Baker as the former commander of the 4th F-I returns from Korea

Col. Royal Baker, history's top jet ace with twelve MIG-15s to his credit, got a warm welcome in Los Angeles March 23, when AFA's Los Angeles Group, comprising six area AFA Squadrons, honored him on his return to the US from Korea. He had been Commander of the 4th Fighter-Interceptor Group there, and before leaving received the Legion of Merit from Gen. O. P. Weyland, CG, FEAF.

The reception committee that greeted Baker at LA's International Airport included Mayor Fletcher Bowron, AFA President Arthur Kelly, California Wing Commander James McDivitt, Group Commander Bernard Peters, North American Aviation's President Lee Atwood, Maj. Gen. William Morgan, CG, Western Air Procurement District, and other civic, AFA, and military leaders. The jet ace's wife arrived at the airport minutes before Colonel Baker's B-26 came in from San Francisco.

After a motorcade tour down LA's "Miracle Mile," Mayor Bowron made Colonel Baker an Honorary Citizen in a ceremony on City Hall steps. A luncheon and press conference followed the civic reception. That evening Baker appeared on several television and radio shows.

Baker's next flying job, after a rest in McKinney, Texas, his home, will be as project pilot for the USAF's new delta-wing interceptor, the F-102, featured in the December issue of AIR FORCE Magazine. The 34-year-old jet ace and Mrs. Baker have four children.

Mrs. Baker arrives in LA via Western Air Lines to welcome her air hero husband. She's greeted by Bernard Peters (left), Group Commander, and Nicholas Gyopyos, Vice Commander.

Ohio Convention

The Biltmore Hotel, Dayton, was the scene of the recent Ohio Wing Convention, attended by representatives of all active Ohio Squadrons. The host Squadron was honored when its Past Commander, Norman Miller, 11 West Monument Avenue, was elected Wing Commander for the coming year.

The business sessions centered on the adoption of an up-to-date Wing Constitution, and the recent decline of AFA activity in the Wing. Miller has pledged himself to the rebuilding of two of the Ohio Squadrons that are now inactive and the chartering of two new ones.

Other officers elected were Dick Girkins, Toledo, Vice Commander; Morris Ribbler, Dayton, Secretary; and Larry Murnane, Columbus, Treasurer.

Out-of-state guests included Morry Worshill, Regional Vice President; LeRoy Kwiatt, Chicago; and Gus Duda, representing National Headquarters.

SQUADRON OF THE MONTH

Metropolitan Philadelphia Squadron

CITED FOR

continued success in the field of AFA membership procurement, through the activities of the membership committee. For this contribution to the over-all success of the Association, AFA salutes the Metropolitan Philadelphia Squadron.

May Wing Conventions

Two important Wing Conventions are scheduled for this month.

First is the Wisconsin meeting in Milwaukee, with the new Billy Mitchell Squadron acting as host, on May 3. Particular attention is called to this meeting in Racine and Madison. Details may be obtained from Kenneth Feldmann, 3534 North 8th Street, Milwaukee Squadron Commander.

On May 23, at the Hotel St. George in Brooklyn, the sixth annual New York Wing Convention will open. Stanley Denzer, 1086 Ocean Avenue, Brooklyn, convention chairman, announces a full program of airpower activities, with the principal speaker to be Lt. Gen. Leon

(Continued on page 77)

With AFA President Arthur F. Kelly (left) and Col. Royal Baker (center) are the Los Angeles area AFA Squadron commanders and officers of the reception committee.

Colonel Baker acknowledges Los Angeles Mayor Bowron's proclamation making him an honorary citizen in ceremony at LA's City Hall. The Mayor and Mrs. Baker are seated.

The *Beaver* (L.20)

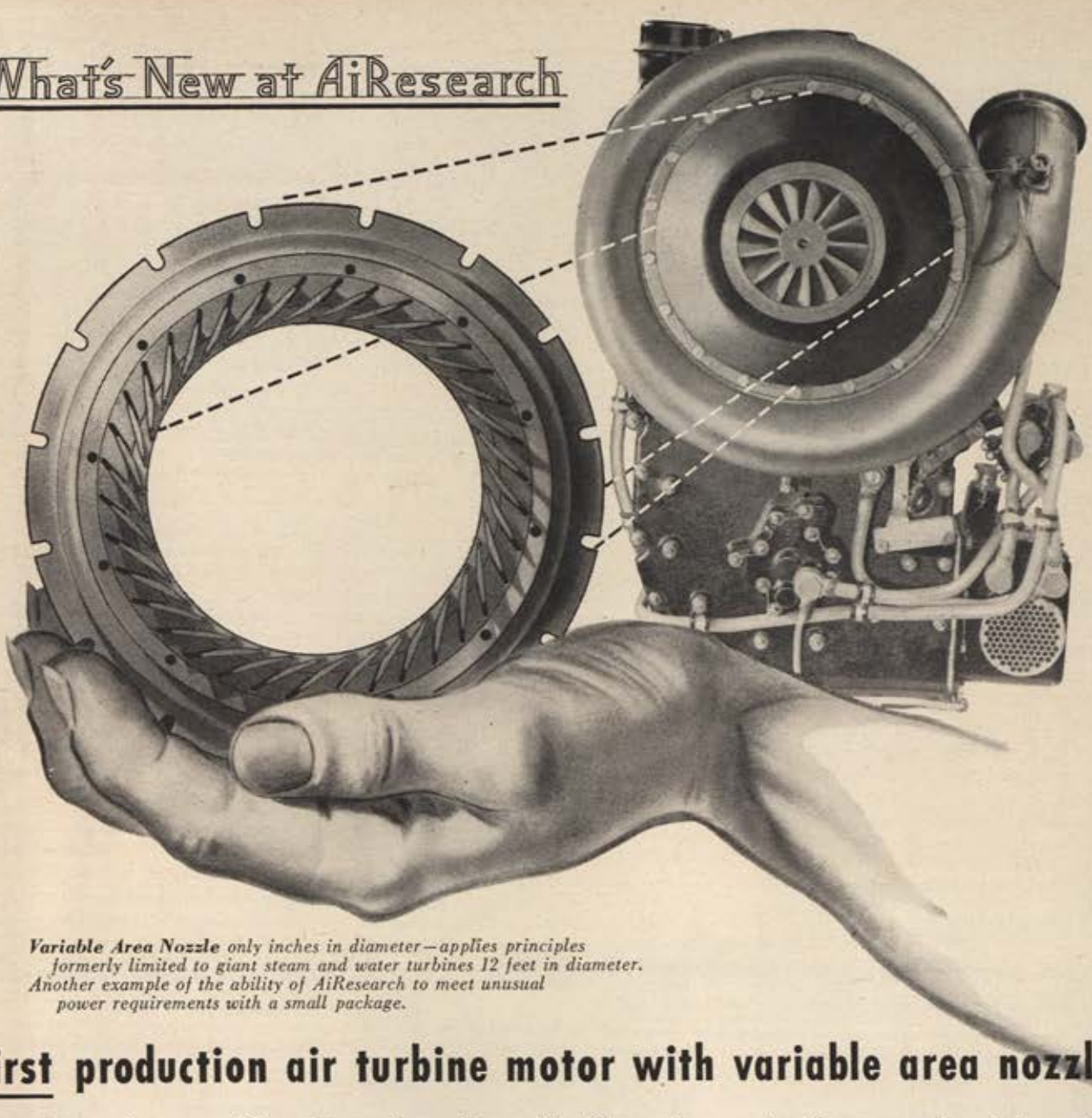
AMBULANCE

We are proud of the fact that a single L-20 evacuated from a Korean battle zone over 200 litter casualties in a three-week period.

Varied missions are routine tasks for the versatile Beavers in service with U.S. Army and U.S. Air Force.

DESIGNED AND MANUFACTURED BY
THE DE HAVILLAND AIRCRAFT OF CANADA LIMITED
POSTAL STATION "L" TORONTO, ONTARIO

What's New at AiResearch



***Variable Area Nozzle** only inches in diameter—applies principles formerly limited to giant steam and water turbines 12 feet in diameter. Another example of the ability of AiResearch to meet unusual power requirements with a small package.*

First production air turbine motor with variable area nozzle!

During the past few years, AiResearch scientists have pioneered a whole new power technology in the development and operation of *small* air and gas turbine motors.

An example is this 52HP air turbine motor, shown above. Now in production for leading turbine propelled aircraft, this motor is one of 23 basic pneumatic power machines developed and manufactured by AiResearch.

This motor incorporates a variable area nozzle, first developed by AiResearch.

Acting automatically, the nozzle precisely adjusts turbine torque to power requirements and greatly reduces the air consumption necessary with ordinary throttling controls.

The air turbine motor drives hydraulic pumps and constant-speed DC generators and alternators, formerly driven by the main engine. Its four accessory pads permit remote location of accessory functions, thus eliminating service operations in the engine nacelle.

Would you like to work for us? Qualified engineers, scientists and skilled craftsmen are needed here.

AiResearch Manufacturing Company

A DIVISION OF THE GARRETT CORPORATION

LOS ANGELES 45, CALIFORNIA • PHOENIX, ARIZONA

DESIGNER AND MANUFACTURER OF AIRCRAFT EQUIPMENT IN THESE MAJOR CATEGORIES

Air Turbine Refrigeration | Heat Transfer Equipment | Electric Actuators | Gas Turbines | Cabin Superchargers | Pneumatic Power Units | Electronic Controls | Cabin Pressure Controls | Temperature Controls

Senior Scout David Pankopf, center, gets copies of AIR FORCE from Cecil Howard, Pasadena Past Commander, as first Air Explorer unit is formed in Pasadena, Calif. The others, from left, are Scout Executive Herb Williams, Col. Arthur Small, Cal-Tech PAS&T, AFA's Louis Hauger, and Frank Williams, vice principal of Monrovia-Duarte High School.

Johnson, CG, ConAC. Principal social affair will be the annual airpower banquet and ball.

Omaha Organizes

The latest squadron to be organized is AK-SAR-BEN Squadron of Omaha, Neb. At the original meeting, Arthur C. Storz, one of the organizers, declared, "We intend to have the largest Squadron in the country." Events thus far have tended to bear out this pledge. The first meeting was attended by some thirty charter applicants, and the Squadron subsequently took part in a testimonial dinner honoring Gen. Curtis LeMay, CG, SAC, whose headquarters are at nearby Offutt AFB.

Arthur E. Miller, 2110 South 105th Street, was elected first Commander, and other officers include R. Hart Storz, Vice Commander; J. Donald Ashford, Secretary, and John Markel, Treasurer.

Outstanding cooperation has been received from the personnel at Offutt AFB, and both General LeMay and Col. A. J. Beck, Base Commander, have pledged their support of this new AFA unit. One of the aims of the Squadron is the organization of a Nebraska Wing.

NYC WAC Squadron

It was "Saturday night at the Waldorf" for members of New York City's WAC Squadron and their friends recently at the annual installation dinner for the incoming Squadron officers.

Principal speaker was Gill Robb Wilson, Manhattan Squadron Commander and a National Director. Other guests included Mary Gill Rice, a Past Commander of the WAC Squadron, and Milton Solomon, Past National Commander of the Marine Corps League.

Installed as Commander was Miss Irma Bernstein, 221 East 18th Street, Brooklyn. Other officers include Sue Mosca, Edna Schenck, Odelie Burgunder, and Josephine Simonson.

Frisco Honors Gabreski

The San Francisco Squadron recently held its annual installation ceremony at the Cabana Club, and paid honor to Col. Francis Gabreski by naming him Honorary Lifetime Commander, a position held previously by Gen. "Hap" Arnold and Maj. Gen. John Upston.

Newly elected officers are Robert A. Dobbins, 2811 Mission Street, Commander, and Elmer Barber, Donald Lanktree, Ed Olsson, Maury Hamilton, and Bill Kavanaugh.

Outgoing Commander Charles Morgan presented awards to the Squadron's "Men of the Year"—William Berman and Frank Chun—for their work during the past year.

Tom Stack, who was co-chairman with Ed Olsson, presented Morgan with a gold watch on behalf of the Squadron.

Philadelphia Squadron

The first female Commander of a "mixed" AFA Squadron was installed recently when Elizabeth MacKenzie, 906 South 46th Street, Philadelphia,

(Continued on following page)

Part of the airpower story told in a window display prepared by the Nittany Squadron, State College, Pa., recently. Display included VA citation, posters, and aircraft models.

took the gavel as Commander of the Metropolitan Philadelphia Squadron.

Other officers include James Gilboy, Owen Ferry, Sarah Downing, and Anthony Galasso.

Officers of the Auxiliary are Mrs. Lee Gilboy, President; Mary Dougherty, Vice President; Betty Meredith, Secretary; and Tess Ferry, Treasurer.

The oath of office for the Squadron was administered by Regional V-P Randall Leopold, and for the Auxiliary by Mrs. Owen Ferry, Wing Auxiliary President.

Also present were Col. Charles W. Skeele, Commander of the 1st Air Reserve District, and Gus Duda, representing National Headquarters.

LA Talks Helicopters

In Lecture Series

The Greater Los Angeles Squadron had as its guest speaker at a recent meeting Robert I. Brayley, Supervisor of Mail and Cargo Service, Inc., who spoke on "Helicopters and Air Mail Service." A film depicting the development of air mail service in the Los Angeles area was shown.

The public is invited to these lectures sponsored by the Squadron, and a good reaction is reported by Nicholas Gyopyos, Vice Commander who also doubles as Program Chairman.

Richard S. Button, 2943 West Avenue, newly elected Commander, invites all LA area people interested in airpower to attend the series.—END

CREDITS
Front cover—Charles deM. Barnes; page 23—Arlo Greer; page 34 (Undersecretary Douglas) — International News Photos; page 30 and 33—Edward F. Walton; pages 44 and 45—Watson Holley; page 46—Wide World Photos.

It's the size of the FIGHT in the man!

That's right! In the U. S. Air Force, it's not the size of the man in the fight—it's the size of the FIGHT IN THE MAN! And Aviation Cadets *must* have plenty of it. For Cadet training is rugged. If you're good enough . . . tough enough . . . smart enough . . . if you can take it while you're learning to dish it out, you can have one of the most fascinating careers in the world. You'll be equipped to fly the latest, hottest planes. You'll be prepared to take your position as an executive, both in military and commercial aviation as well as in industry. And while you're helping yourself you'll be helping your country.

WIN YOUR WINGS! It takes only a little over a year to win your wings as a Pilot or Aircraft Observer (Navigator, Bombardier, Radar Operator or Aircraft Performance Engineer). But at the end of your training you graduate as a 2nd Lieutenant in the Air Force, with pay of $5,300.00 a year.

ARE YOU ELIGIBLE? To qualify as an Aviation Cadet, you must have completed *at least* two years of college. In addition, you must be between 19 and 26½ years, unmarried, and in good physical condition.

New Aviation Cadet Training Classes Begin Every Few Weeks!

HERE'S WHAT TO DO:

1. Take a transcript of your college credits and a copy of your birth certificate to your nearest Air Force Base or Recruiting Station. Fill out the application they give you.
2. If application is accepted, the Air Force will give you a physical examination.
3. Next, you take a written and manual aptitude test.
4. If you pass your physical and other tests, you will be scheduled for an Aviation Cadet training class. The Selective Service Act allows you a four-month deferment while waiting class assignment.

WHERE TO GET MORE DETAILS: Visit your nearest Air Force Base or Air Force Recruiting Officer. Or write to: Aviation Cadet, Headquarters, U. S. Air Force, Washington 25, D.C.

U.S. AIR FORCE

DESERT SLEIGH RIDE

An 'omniverous curiosity,' a sled, a man probe deceleration's crushing effects

Harnessed, strapped, and wired for reactions, Col. Stapp seeks new data.

SOMEONE POKED his head in the briefing room door and shouted, "He's over the field with one and two feathered!" The intelligence briefing broke up before it could be dismissed. Like iron filings to a magnet, men of the 91st Strategic Reconnaissance Squadron, Johnson AFB, Japan, were drawn to the flight line.

The RB-29 was on its base leg. Its bank from base to final approach seemed steep. That was only because the lifeless and heavily encumbered left wing was so agonizingly slow in raising and leveling off.

"He's got it made," someone said.

Then it happened. Not more than one hundred and twenty feet from the end of the runway the left wing dipped. Slowly. Then it dropped. Faster and faster. A spiral of smoke and dust twisted skyward.

Of the front end crew, only the navigator was alive. Rescue workers found him buried in debris but his injuries were not fatal. In a surprisingly short time he was back at squadron duties. No broken bones; just bruises and memories.

The luck of that navigator is a tangible thing. He is living proof of its existence. But was it just luck?

Theoretically, couldn't all of the men in the front end of that RB-29 have survived?

The man probably closest to the answer is Lt. Col. John P. Stapp, USAFR (MC), of the Air Force Aero Medical Laboratory of the Air Research and Development Command (ARDC), who spent more than four years finding out just how tough the human body is.

Approximately six months after the reconnaissance mission above, Colonel Stapp, then a major, walked away from a "crash"—the last of a series of "crashes" he or his men lived through and walked away from.

The place was Edwards AFB, Calif. The day: June 6, 1951. The site: Hot, sagebrush-spotted, silent Muroc dry lake. Principals: Stapp and his small band of airmen technicians. Setting: A cumbersome-looking contraption of tubular steel mounted on a standard gauge railroad track.

Suddenly the desert silence shivered to the blast of exploding rockets. The steel contraption rumble-roared down the track at more than two miles a minute. Aboard was Colonel Stapp. He was wearing a standard Air Force V-type air crew safety harness. His hands were strapped to hand-holds.

The sled stopped. There was silence again. The only movement was the hurried grouping of Stapp's men around him. He was pale and shaking. Veins in his right eye were hemorrhaging. His blood pressure was soaring and his heart was pulsing out 130 beats a minute. The "crash" was over.

In less time than it takes to tell it, Colonel Stapp had withstood a crash impact of more than forty-five Gs, forty-five times more than the pull of gravity! During that time—less than a quarter of a second—Stapp endured the strain of stopping from a speed of 120 mph within nineteen feet.

Why?

To test a theory that Stapp thought would result, if proven accurate, in greater flying safety for AF men, and for passengers flying in commercial transports.

Stapp, a flight surgeon at the Aero Medical Laboratory of the Wright Air Development Center, Dayton, Ohio, theorized it wasn't how hard a force—Gs—hit, but how fast. The speed with which a body stopped—decelerated—accounted for more injuries and deaths than the amount of Gs the body absorbed while decelerating.

By H. G. Medlock and Everett E. Dodd

Prior to his June 6 ride Stapp subjected himself to a thirty-eight-G crash-impact force. On it he suffered a fractured wrist and experienced shock symptoms.

Stapp reasoned he could withstand more than a thirty-eight-G force, provided it was applied over a greater elapsed time—time measured in tenths of a second. The force on the thirty-eight-G run was applied in .16 seconds; on the forty-five-G run, in .23 seconds. He suffered less discomfiture after the forty-five-G run. His "jolt" theory was firmly founded.

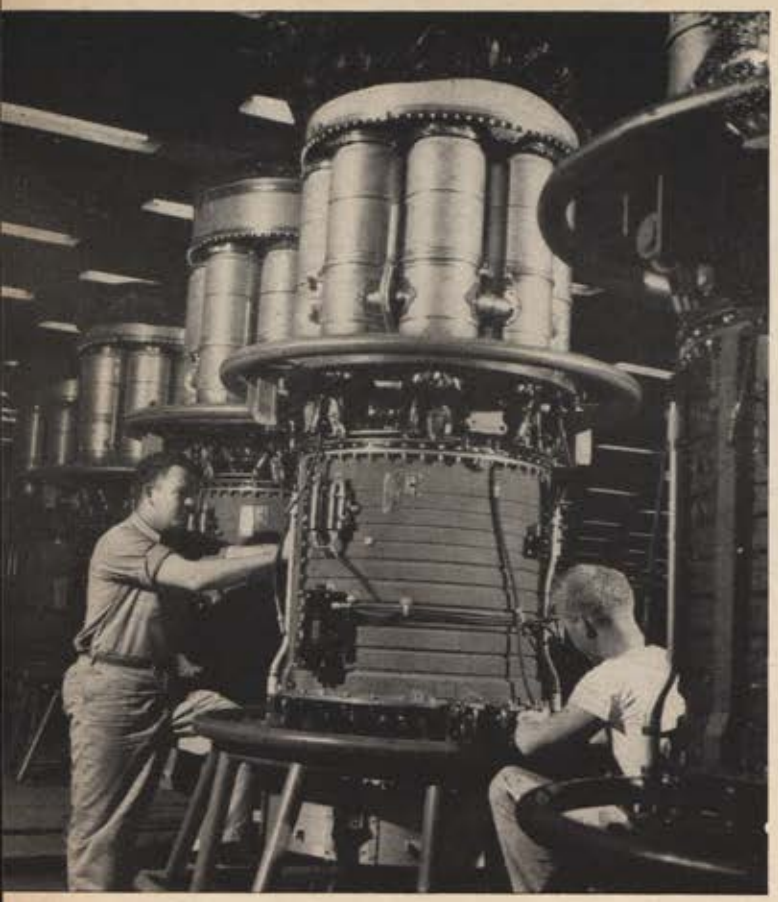
For his experimentations and subsequent scientific observations, then Secretary of Defense Robert A. Lovett awarded the Air Force Medal of the National Air Council to Colonel Stapp in a ceremony at the Pentagon in October 1951. In 1952 he received the Legion of Merit.

And, in January of this year, Colonel Stapp "for outstanding contributions to the advancement of aeronautics through medical research" received the John Jeffries Award for 1952.

(The John Jeffries Award was established in 1940 and honors the memory of Dr. John Jeffries, an American physician who, with the French balloonist Blanchard, made the first aerial voyage across the English Channel, in 1785.)

Colonel Stapp will deny he is poured from a hero's mold, or that he is of heroic proportions. He isn't.

(Continued on page 83)



G.E. Salutes Armed Forces With

Jet Power for Peace

During a half century in which man caught up with and exceeded the speed of sound, General Electric has been an integral part of aviation. From G-E drawing boards and production lines have come many significant contributions to the progress of aviation. Now, on Armed Forces Day, 1953, production for peace has made G.E. one of the world's largest manufacturers of jet engines.

Simultaneously, General Electric's vast research, design, and development facilities are steadfastly probing into the vast unknown areas of jet propulsion. And a world-wide service engineering organization assures G-E powerplants peak performance—no matter where they may be.

In the future, as during the past fifty years, G.E. will continue to pioneer and produce for aviation. *General Electric Co., Section 230-15, Schenectady 5, N. Y.*

G-E J47 jet engines power all of these planes

NORTH AMERICAN F-86D, holds 698.5 MPH record

BOEING B-47, world's fastest known bomber, six jets

NORTH AMERICAN F-86, outscoring MIG in Korea

NORTH AMERICAN B-45 operational jet bomber

MARTIN XB-51, experimental tactical bomber

REPUBLIC XF-91, high-speed interceptor

CONVAIR B-36, intercontinental bomber

NORTH AMERICAN FJ-2, new Navy fighter

You can put your confidence in—

GENERAL ELECTRIC

He is a medium-height (five feet, eight inches), plump (more than one hundred and seventy pounds), bespectacled, studious-appearing flight surgeon. He describes himself as a "cross between a plain country doctor and an absent-minded professor."

But as the "plain country doctor" is many times the hero of fact and fiction, Colonel Stapp is also a hero. He belongs to that select (sometimes anonymous) little band of scientists who risk their lives to provide themselves and, in Colonel Stapp's instance, medical science, with answers to time-long questions. But it was only after a series of some of the most jarring, head-yanking, gut-wrenching stops that Colonel Stapp found an answer to the question ARDC asked him in March 1947.

How much force can a person withstand and still be conscious and able to make an exit from a crashed plane before he is cremated?

An Air Force survey suggested the question. The traffic division of the AF discovered that of 254 air crash deaths, 204 were due to crushing injuries. Dreaded fire was the secondary cause.

A reassessment of previously held theories was demanded. Out the window was the one that a plane could withstand more crash impact than a man. Questioned was the one that said a man couldn't endure forces of twenty-five or thirty Gs.

The assignment called for patience, perseverance, and a knowledge of physics and medicine. Stapp was well qualified.

Twice a doctor (philosophy and medicine), Colonel Stapp is a many-sided man. He's a man with an omniverous curiosity about everything who gripes enthusiastically about administrative red tape, worries about his subordinates' welfare, cooks, cracks puns, speaks Portuguese fluently, and likes music (from Johann Sebastian Bach to Louis Armstrong).

He was the eldest of three boys born to missionary parents, the Reverend and Mrs. Charles F. Stapp. Born in Brazil, Stapp says he didn't learn to speak English until he was six. With the aid of a scholarship he attended a denominational college in Texas, and graduated a B.A. in zoology and chemistry. He stayed on to complete his work for an M.A.

Then, he says, "I planned to teach, save my salary and return to school," for a Ph.D.

"My salary the first year," he recalls, "was room and board and all of $60 cash and $100 the second year." Stapp doesn't mention how much he saved, but does say he quit, "took a teaching assistant's job at the University of Texas and worked off my Ph.D." It was in bio-physics. He was now ready to fulfill a pledge made long before.

Still a vivid but dark memory was the death of a young cousin of Stapp's, who had died for want of adequate medical care. The cousin died a painful death while 18-year-old Stapp could only stand by and watch. He resolved then he would be a doctor. Stapp, who was a superior student, studied medicine at the University of Minnesota and graduated when he was 34. It had taken him 16 years, but he had kept the important faith—with himself. Shortly after graduation, he entered the AF.

A year before the Air Force assigned Stapp to conduct his research probing deceleration's effect on the human body, it had received from Northrop Aircraft, Inc., that company's design for the "human decelerator" used by Colonel Stapp in his experiments at Muroe.

It was a 12½-foot-long, 600-pound sled of tubular steel, fitted with slippers designed to secure the sled to the standard gauge railroad track on which it would make its rocket-propelled runs. Slippers were used instead of wheels; it was feared the sled would have a tendency to leave the track if wheels were used. Colonel Stapp and his men wanted no part of a flirtation with that tendency. The track, 2,000 feet long, had been laid previous to Stapp's tests and used for V-1 rocket research.

About 600 feet from the end of the track forty-five sets of hydraulically operated mechanical brakes were installed between the rails. Each braking unit consisted of four rectangular metal shoes, five inches by eleven inches, that provided fifty-five square inches of braking surface each, or 220 square inches to a unit.

The brake units were paired off and, prior to each run, adjusted to be tripped off mouse-trap fashion by four shock-mounted triggers on the front of the sled. When actuated, the brakes would clamp vise-like against two 300-pound keels suspended under the sled. If all units were used, the resultant braking pressure could be varied from 990,000 to approximately eight million pounds. It would be, as Colonel Stapp said, "like pulling a giant knife through a row of steel vises."

(The variable braking pressure figures are obtained by multiplying braking force per square inch [100 to 750 pounds] by each unit's braking surface [220 square inches] by number of units [45]—The Editors.)

The sled was propelled by three 125-pound rockets mounted in the rear. Using potassium-perchlorate and asphalt as fuel, each developed a thrust of 1,000 pounds for five seconds. Fired conjunctively they accelerated the sled from a standing start to 180 mph in a distance of 500 feet. It then decelerated because of friction, weight, and wind resistance. When it reached the pre-set brakes it was traveling about 155 mph.

To measure impact necessitated getting or devising instruments for measuring rate of speed, deceleration, and rate of onset deceleration. "This problem of instrumentation was the toughest one we had," Colonel Stapp said. To George E. Nichols, a Northrop engineer, was delegated the onerous task.

The precision instruments used would have delighted even the zaniest gadgeteer:

A four-channel frequency-modulated transmitter, mounted on the floor of the sled, transmitted data on the amount of tension applied to seat harnesses, seat strength, displacement of the body at the moment of impact, and speed.

A camera mounted in the sled's windshield recorded the facial expressions of the man on the sled.

Six cameras located on the sidelines, turning at 2,000 to 3,000 frames per second (average movie camera turns at twenty-four frames per second), recorded the man in profile.

(Continued on following page)

Stapp, bleary-eyed after 45-G run, undergoes post-"crash" examination.

Another camera set to focus on the braking section recorded deceleration with an electronic device.

In addition, Colonel Stapp, acting in the multiple-role capacity of commanding officer, doctor, scientist, and human guinea pig, had to have medical instruments to perform before-and-after physical checks on those who volunteered to ride the sled.

"We decided," he says, "that if the effects were not lasting enough to be measured within a few minutes after the run, they were not serious enough to matter. Undoubtedly there were passing effects that could not be measured. For instance, a one-pound heart would be bound to skip a beat or two as it hit the ribs like a thirty-pound weight at the moment of a thirty-G impact."

Col. Stapp (center) and AF technicians are shown grouped before the sled used in deceleration tests. Seated in front of Stapp is S/Sgt. Leach, a rider. On Stapp's left is George E. Nichols, Northrop engineer on the project.

First experiments with the sled were "dry-runs" to eliminate bugs in the braking system and to test types and tolerances of seats and harnesses. On these runs dummies and ballasts were used. In December 1947, Stapp took the first human ride.

The previous dry-runs had proved that harness and seat could withstand the jolt of deceleration, but there still remained the lingering memory of "Oscar's" ride.

Oscar was a dummy used on test runs. On one run the sled and seat stopped. But not Oscar. He burst through his harness, through a one-inch thick wooden windshield, and plowed a furrow of sand between the rails on his "face."

But Stapp's first ride turned out to be uneventful. He set the run so he would receive about ten G at the moment of deceleration. He used only one rocket. He faced the rear. The ride was smooth and convinced the scientist that much higher rates of deceleration could be tolerated.

It wasn't until June 23, 1949, that the first forward-facing runs were made. The volunteer passenger wore standard Air Force safety harness and shoulder straps and lap belt.

Stapp's succinct report:

"During deceleration the subject was seen to sway forward with head and shoulders, and then to slide forward from the waist down so that the body was jack-knifed around the lap belt. The subject was unable to brace himself against this effect because no foot rest nor hand holds were yet provided on the sled. As the sled came to a halt, the subject was observed to turn pale and show a somewhat pained expression."

There were no more man-carrying runs until August 1949. Not until the harness was restyled to include two leg straps. Rudder pedals were installed, and two hand grips added on either side of the legs. The helmet was discarded because it dislodged on impact and became a nuisance.

Colonel Stapp tested the new harness on August 11. It was a fifteen-G run at 1,000 G per second rate of onset. His report stated, "The impression was that much higher impact forces could be tolerated." He noted the pinching of the newly added leg straps, and decided to test the harness without them.

On this run the shoulder straps climbed up on the sides of his neck, burning and bruising it. The lap belt slammed against his ribs, fracturing a cartilage. The colonel never permitted his men to make this run.

An inverted V attachment to the Air Force harness was finally evolved. The small end of the V was attached to the front of the lap belt, the two straps went down and around the legs and fastened against the rear of the seat. Shoulder straps were widened.

The tests continued. Runs were made of fifteen Gs, then twenty Gs, twenty-five Gs, and thirty Gs—all at the same rate of onset, 1,000 G per second. At thirty G, T/Sgt. Richard H. Allgire suffered symptoms of shock. Colonel Stapp, duplicating the ride, suffered the same.

Had they reached the limits of human tolerance to crash forces?

Stapp thought not. The harness straps were secured even tighter. The run proved Stapp to be right. The "limits of human tolerance" hadn't been reached. Another run was scheduled.

This time the leg straps weren't used. The passenger faced to the rear. He suffered only pain and discomfort when his helmeted head struck the back of the seat, and he had a sore elbow. (His hand had left the hand grip; only the cat-like eye of the cameras had caught the movement. Even rider M/Sgt. William R. Rhea was unaware he had lost his grip until shown the films.)

This was added proof that rearward-facing seats, securely installed and equipped with lap belts of thirty G or more tolerances, are safest for passengers. Stapp returned to forward-facing rides.

On one of them S/Sgt. Raymond Leach was the volunteer. It would be a thirty-five-G deceleration run with 1,200 G per second rate of onset—200 G more than previous runs.

The rocket-driven sled roared from its standing start. Then something went wrong. The braking system, augmented by brakes not used in other trials, grabbed at the sled's underslung keels violently—too violently. Leach slammed to a stop.

"I knew I was at the end of the run," he said, "but seemed to slip into a mood wherein I thought I was still traveling. I knew nothing until someone said 'put your head forward.' . . . I gradually felt someone massaging my neck and asking if I felt better. I answered: 'Yes.'"

Post-run calculations showed Leach

(Continued on page 87)

American progress in aviation is respected wherever the compass points

America's achievements in the world of aeronautics have built an enviable reputation that reaches to the four corners of the earth.

A prime factor in building this global reputation has been persistent research for better materials . . . better fabrication . . . and better production methods.

To Progress through Research is a constant in Rheem development and manufacturing. Our facilities are available.

RHEEM—Aircraft Division, Downey, California . . . Research and Development, Whittier, California

The Travel Card that gave "CREDIT" to the public

In 1934, when American Airlines issued the first credit card, proposed by C. R. Speers, an American sales manager, there was an immediate expansion of passenger traffic in the first class air travel field.

Up to then, all tickets had to be purchased by cash. This was a decided disadvantage to businessmen who found it necessary to carry large sums of money with them when they flew from one destination to another on an extended business trip. Credit cards developed customers for the airlines from firms who had not previously encouraged their personnel to fly on company business. Airline credit cards have become so popular and are now so widely used that they are accepted as evidence of credit at leading hotels and drive-your-self automobile agencies throughout the entire country.

The first issuance of credit cards is only one of many milestones in the history of air transportation introduced by American Airlines.

AMERICAN AIRLINES INC.

America's Leading Airline

NO. 2 IN A SERIES OF ADS SHOWING THE PROGRESS OF AIR TRANSPORTATION

SLEIGH RIDE——CONTINUED

sustained 38.6 G with a rate of onset of 1,350 G! The following coma he experienced indicated that human tolerances to crash forces had been reached. Nevertheless, Stapp determined to rerun Leach's ride.

The violent impact of the sled as it hit the brakes caused a multiple fracture of Stapp's right wrist when his hand flew from the hand grip, even though it had been strapped there. His heart pounded and his vision blurred. However, he retained consciousness.

The Stapp-Leach rides were of dual importance. They showed:

Man could not safely sustain crash forces of more than thirty-five G with an onset rate of 1,000 G. Subjected to more he might suffer shock or injuries that would keep him from getting out of a burning plane.

Perhaps man could sustain forces of more than thirty-five G, provided the onset rate was less than 1,000 G.

Another broken wrist (he was testing chute harnesses at the time) and months later in May 1951, Colonel Stapp commenced the last month of his now more than fifty-month-old experiment. On June 6, 1951, he was finished except for recording and evaluating his findings in a two-volume report "Human Tolerances to Abrupt Decelerations."

Already his findings have resulted in adoption by the AF of the inverted V harness, tested to 45 G (the former harness was tested to 17 G).

Paratroopers are now protected with a side-saddle harness that fits snugly over the shoulder nearest the front of the ship (before they used only lap belts).

The Royal Air Force and British commercial airlines were spurred by Stapp's findings to speeding the installation of rearward-facing seats. And our own Military Air Transport Service (MATS) moved ahead on its program to do the same.

It is still too early to attempt a final assessment of Colonel Stapp's findings. But is not too early to laud Colonel Stapp, now Chief of the Aviation Biology Field Laboratory at Holloman Air Development Center, Holloman, N. M., and the men who made those findings possible.

It is all too frequent (in this age of the hydrogen and atom bombs, television, and computing machines) that we tend to relegate man to some position inferior to products of his, man's, imagination. Colonel Stapp and his men are refreshing reminders that perhaps that relegation may be in error.—END

CHANGING ADDRESS?

If you're planning to move and know your new address, clip this coupon and shoot it on to us to avoid missing a single issue of AIR FORCE. Also send one of the mailing labels from a back issue to show your old address. Allow six weeks for the change to become effective.

AIR FORCE MAGAZINE
1424 K Street N.W. Washington 5, D. C.

Name.....

New address.....

City..... Zone..... State.....

THIS IS AFA

The Air Force Association is an independent, nonprofit, airpower organization with no personal, political or commercial axes to grind; established January 26, 1946; incorporated February 4, 1946.

OBJECTIVES

• To assist in obtaining and maintaining adequate airpower for national security and world peace. • To keep AFA members and the public abreast of developments in the field of aviation. • To preserve and foster the spirit of fellowship among former and present members of the United States Air Force.

MEMBERSHIP

Active Members: Individuals honorably discharged from military service who have been assigned or attached to the USAF or its predecessor services, or who are currently enrolled in the Air Force Reserve or the Air National Guard. $5.00 per year.

Service Members (non-voting, non-office holding): Individuals now assigned or attached to the USAF. $5.00 per year.

Cadet Members (non-voting, non-office holding): Individuals enrolled as Air Force ROTC Cadets or as Civil Air Patrol Cadets. $3.00 per year.

Associate Members (non-voting, non-office holding): Individuals not eligible for Active or Service membership who have demonstrated their interest in furthering the aims and purposes of Air Force Association. $5.00 per year.

Industrial Associates: Companies affiliating with Air Force Association on a non-membership status who receive subscriptions to AIR FORCE Magazine and special magazine supplements known as Industrial Service Reports.

OFFICERS AND DIRECTORS

Arthur F. Kelly, President
Regional Vice Presidents: Edwin T. Morrell (New England); Randall Leopold (Northeast); George D. Hardy (Central East); Jerome A. Waterman (Southeast); Morry Worshill (Great Lakes); Merle S. Else (North Central); Frank T. McCoy, Jr. (South Central); Harry B. Johansen (Midwest); N. Michael Kavanaugh (Far West); William Thayer Tutt (Rocky Mountain); Thomas D. Campbell (Southwest); H. R. Wallace (Northwest); Roy J. Leffingwell (Pacific Ocean). Secretary, Julian B. Rosenthal, Treasurer, George H. Haddock.

Harold C. Stuart, Chairman of the Board
Directors: John R. Alison, George Anderl, Edward P. Curtis, Warren DeBrown, James H. Doolittle, Ira C. Eaker, Cortez F. Enloe, Jr., Samuel M. Hecht, J. P. Henebry, Cass S. Hough, Russell F. Hunt, Robert S. Johnson, George C. Kenney, Thomas G. Lanphier, Jr., Rex V. Lentz, Jerome H. Meyer, William F. Mullally, Charles W. Purcell, Mary Gill Rice, C. R. Smith, Carl A. Spaatz, James Stewart, C. V. Whitney, Gill Robb Wilson.

WING COMMANDERS

George A. Anderl, Oak Park, Ill.; L. A. Ballew, Jr., Johnson City, Tenn.; Thomas E. Bazzarre, Jr., Beckley, W. Va.; I. E. Brodsky, Philadelphia, Pa.; W. P. Budd, Jr., Durham, N. C.; Roland E. Frey, Webster Groves, Mo.; Arthur L. Gordon, Honolulu T. H.; Ashley Green, Portland, Ore.; Norman Miller, Dayton, Ohio; Richard M. Krannawitter, Albuquerque, N. M.; Edwin A. Kube, Minneapolis, Minn.; Robert B. Logan, Muncie, Ind.; Joe Lydick, Fort Worth, Tex.; James H. McDivitt, San Gabriel, Calif.; Stanley K. McWhinney, Lansing, Mich.; George P. Miller, Chickasha, Okla.; D. Warren Jewett, Pueblo, Colo.; Charles W. Purcell, Baltimore, Md.; Lloyd J. Streifuss, Washington, D. C.; Marcello A. Tropea, Providence, R. I.; Forrest L. Vosler, Marcellus, N. Y.; Winfield G. Young, Seattle, Wash.; Robert Westerveld, Hawthorne, N. J.; Stanley E. Zamachaj, Chicopee, Mass.

COMMUNITY LEADERS

Albany, N. Y., Joseph E. Burkart, 1 Lincoln Dr. Glenmonth; **Albuquerque, N. Mex.**, Richard P. Woodson III, Korber Bldg.; **Baltimore, Md.**, Meir Wilensky, P. O. Box 3725; **Battle Creek, Mich.**, William R. Miller, 75 Central St.; **Beckley, W. Va.**, Estil Thorne, 106 Nathan St.; **Berkeley, Calif.**, Donald S. Hawley, 187 Purdue Ave.; **Brooklyn, N. Y.**, Stanley C. Denzer, 1086 Ocean Ave.; **Chicago, Ill.**, Cameron S. Orr, 5702 W. 65th.; **Chickasha, Okla.**, George P. Miller, 1001 Dakota St.; **Chicopee Falls, Mass.**, Francis E. Whittaker, 76 Taylor St.; **Cincinnati, Ohio**, Harold T. Kramer, 625 Ridgelawn Ave., Hamilton; **Cleveland, Ohio**, Lloyd T. Vandervoort, 371 E. 211th St.; **Colorado Springs, Colo.**, Richard F. Love, 1511 E. Boulder St.; **Columbus, Ohio**, Carl F. Glade, 292 N. Warren Ave.; **Dallas, Tex.**, Rex V. Lentz, 3824 Wentwood Dr.; **Dayton, Ohio**, Frederic P. Goulston, 101 Massoak Dr.; **Detroit, Mich.**, Irving H. Kempner, 13133 La Salle Blvd.; **Fort Worth, Tex.**, Joe Lydick, 1301 Foch St.; **Galesburg, Ill.**, Ivan E. Harrison, 1274 Florence Ave.; **Green Bay, Wis.**, Arthur E. Norgaard, Jr., 216 Cherry St.; **Hackensack, N. J.**, Lloyd Nelson, 89 Grand Ave., Montvale; **Honolulu, T. H.**, Joseph M. Murphy, P. O. Box 1618; **Indianapolis, Ind.**, Thurman J. Fleck, 1914 N. Riley; **Johnson City, Tenn.**, L. A. Ballew, Jr., P. O. Box 829; **Kalamazoo, Mich.**, Eugene R. Long, 817 Fairbanks Ave.; **Kirksville, Mo.**, Dr. John L. Biggerstaff, c/o Citizens Nat'l Bank Bldg.; **Lansing, Mich.**, Lynn Erratt, 408 N. Magnolia St.; **Lewistown, Pa.**, Rudolph M. Reynolds, RFD 3; **Long Beach, Calif.**, James P. Regan, 1115 Raymond Ave.; **Los Angeles, Calif.**, Richard S. Button, 2943 West Ave., 33; **Martinsville, Va.**, James B. Jones, Jr., Box 1112; **Milwaukee, Wis.**, Kenneth M. Feldman, 3534 N. 8th St.; **Minneapolis Minn.**, Vernal Boline, 5749 Newton Ave., S.; **Mobile, Ala.**, Charles P. Powell, 3069 Belmont St.; **Modesto, Calif.**, Zenas E. Hanson, 625 Reno Ave.; **Muncie, Ind.**, Robert B. Logan, 210 Glenwood Ave.; **Nashville, Tenn.**, Frank T. McCoy, Jr., 1114 Tyne Blvd.; **New York, N. Y.**, Gill Robb Wilson, 366 Madison Ave.; **Oil City, Pa.**, George Henderson, Division St.; **Pasadena, Calif.**, Louis S. Hauger, 840 N. Michigan Ave.; **Philadelphia, Pa.**, Elizabeth MacKenzie, 906 S. 46th St.; **Pittsburgh, Pa.**, Alexander M. Campbell, 643 Gettysburg St.; **Portland, Ore.**, Kenneth Bostwick, 312 "B" Rd., Kellogg Park; **Racine, Wis.**, Richard W. Korzilius, 824 Park Ave.; **Sacramento, Calif.**, C. J. Collins, 5601 Stockton Blvd.; **St. Louis, Mo.**, Richard W. Wassall, 611 N. Rock Hill Rd.; **St. Petersburg, Fla.**, John E. Mast, 4801 Hyacinth Way, S.; **San Diego, Calif.**, Edward C. Kranch, 8447 La Mesa Blvd., La Mesa; **San Francisco, Calif.**, Robert A. Dobbins, 2811 Mission St.; **San Juan, P. R.**, John H. Garcia, P. O. Box 3744; **Santa Monica, Calif.**, Charles H. Randall, 2505½ Oakland Ave., Venice; **Savannah, Ga.**, Thomas D. Carlton, 1652 Winter Dr.; **Seattle, Wash.**, Winfield G. Young, 2039 E. 103d; **South Bend, Ind.**, Irving Duddleson, 201 N. Walton; **Spokane, Wash.**, H. R. Wallace, P. O. Box 2203; **State College, Pa.**, Ernest R. Shull, 219 S. Sparks St.; **Stirling, N. J.**, Frank DeFilippis, Valley Road; **Stockton, Calif.**, William W. Peterson, 2337 W. Monterey; **Syracuse, N. Y.**, J. William Lowenstein, 1026 Wescott St.; **Taunton, Mass.**, Edwin T. Morrell, 41 Grove St., N. Attleboro; **Toledo, Ohio**, Dean W. Huffman, 511 Congress St.; **Washington, D. C.**, George D. Hardy, 2501 Allison St., Mt. Rainier, Md.

NATIONAL HEADQUARTERS STAFF

Executive Director: James H. Straubel
Program Director: Ralph V. Whitener
Organization Director: Gus Duda
Personal Service Director: Jake Culpepper

Bendix Torque-Link Steering

A new and better steerable nose gear design... Easier and more efficient steering action... Important savings in weight, space and maintenance.

Bendix Torque-Link Steering is a rugged self-contained unit which can be built in as an integral part of any nose strut.

This simple compact steering unit actually does the work of two conventional mechanisms. The hydraulic power cylinders take the place of the upper scissor member of usual torque links. They serve the double purpose of torque links and steering actuators. Thus, with one unit performing dual functions, Bendix Torque-Link Steering obtains important savings in weight, space and maintenance.

In addition, shimmy dampening is more effective because dampening forces are applied at a point where there is the least amount of spring action in the system.

Although Bendix Torque-Link Steering is a new conception of more efficient steering action, it has been fully tested and proved. After exhaustive laboratory tests it is now being used on several of the newer planes with excellent results.

Bendix engineers welcome the opportunity to assist air frame designers in the application of this Torque-Link Steering to their new airplanes.

BENDIX PRODUCTS DIVISION **SOUTH BEND** INDIANA

Bendix AVIATION CORPORATION

Export Sales: Bendix International Division, 72 Fifth Avenue, New York 11, N.Y.

LEADER IN LANDING GEAR

FIRST IN FUEL METERING

OPPORTUNITIES FOR ENGINEERS
in Electronics, Mechanics and Hydraulics

Bendix at South Bend is basically an engineering organization. It is the kind of a business where the key men of the future are likely to be men of engineering and mechanical background. Investigate your opportunities with Bendix. Write Administrative Engineering, Bendix Products Division, South Bend, Indiana.

Bendix Products Division

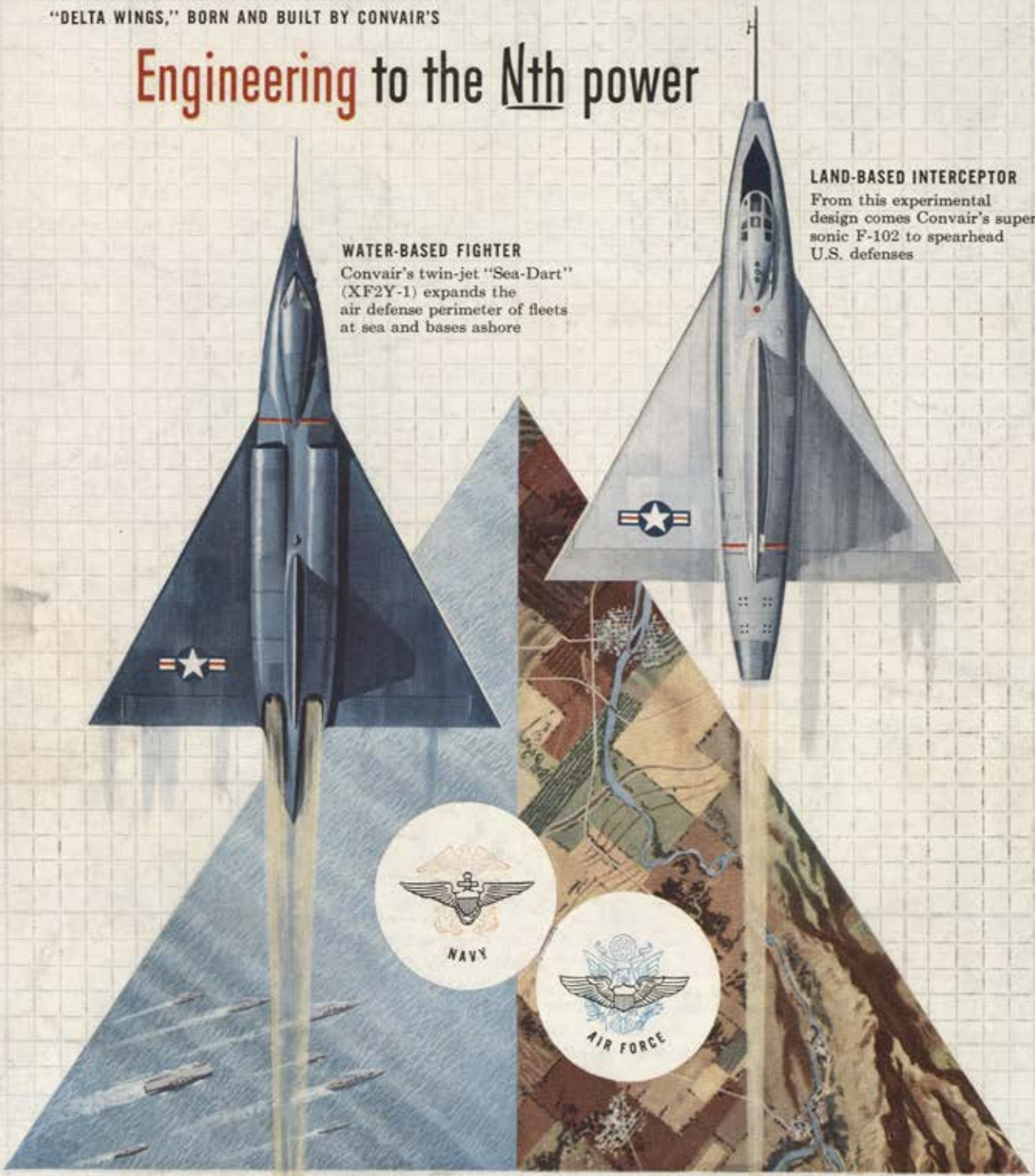
AMERICA'S NEWEST WINGS FOR ATOMIC DEFENSE...

"DELTA WINGS," BORN AND BUILT BY CONVAIR'S

Engineering to the Nth power

WATER-BASED FIGHTER
Convair's twin-jet "Sea-Dart" (XF2Y-1) expands the air defense perimeter of fleets at sea and bases ashore

LAND-BASED INTERCEPTOR
From this experimental design comes Convair's supersonic F-102 to spearhead U.S. defenses



HERE'S A TRIANGLE WITH MORE THAN THREE POINTS

Convair was the first to engineer, build and *fly* the triangular shaped solution to the problem of human flight in the vicinity of the speed of sound... and beyond. Through the versatile skills of Convair engineering, the delta configuration has already given America its first land-based, supersonic interceptor...and the world's first water-based very-high-speed jet fighter. Adaptations of the delta to bomber and transport designs are now under way. Proof again, that Convair engineering achieves the maximum of air power... Engineering to the N*th* Power!

CONVAIR

SAN DIEGO & POMONA, CALIFORNIA
FORT WORTH & DAINGERFIELD, TEXAS