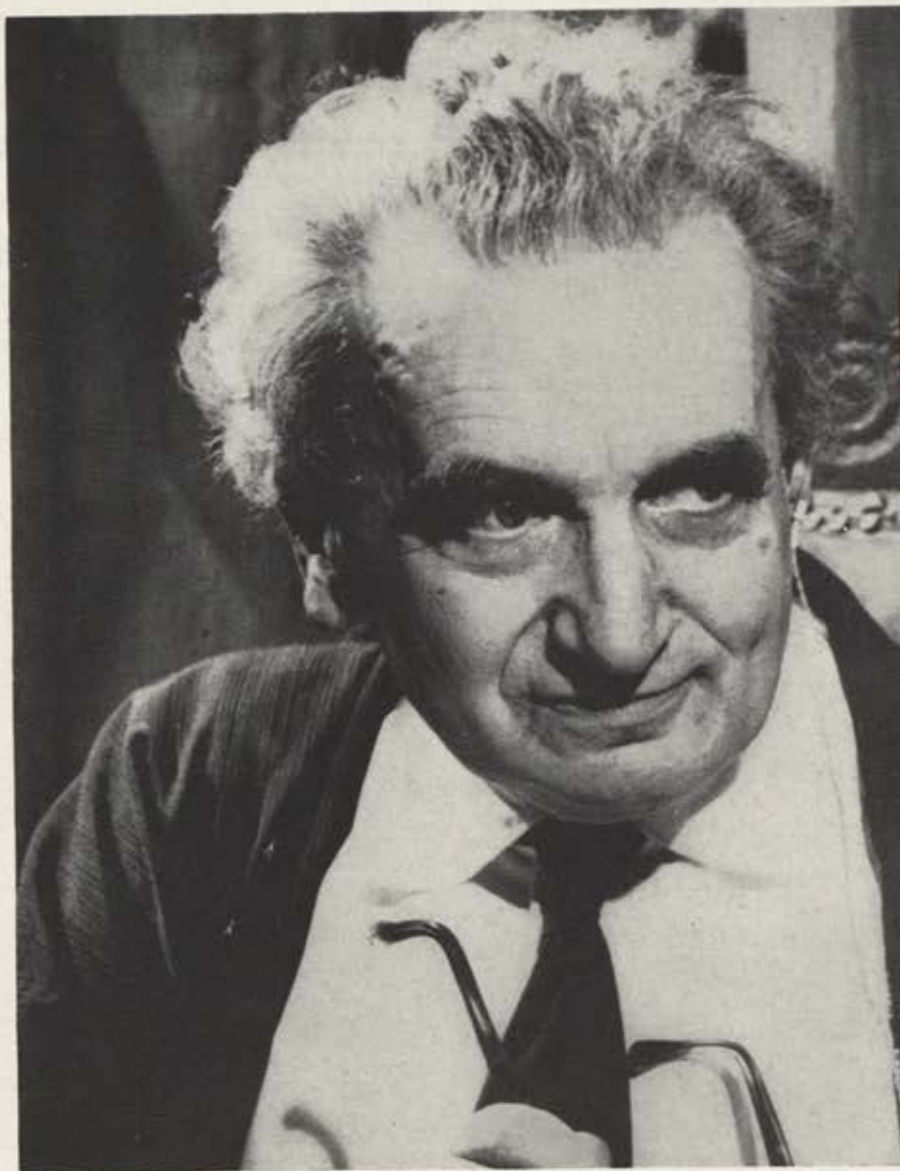


AIR FORCE

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



**Dr.
Theodore
von Kármán**

*The gemütlicher
genius of
aeronautics*

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General Kuter Reports on the Pacific Air Forces • How Penetration Teams Probe SAC Air Base Defenses



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Embodying revolutionary electrothermal systems of ice protection—developed through the teamwork of the National Research Council of Canada and Goodyear—one system of the Iceguard has already been in lengthy service above the Arctic Circle on the Canadian Avro CF-100 all-weather fighters.

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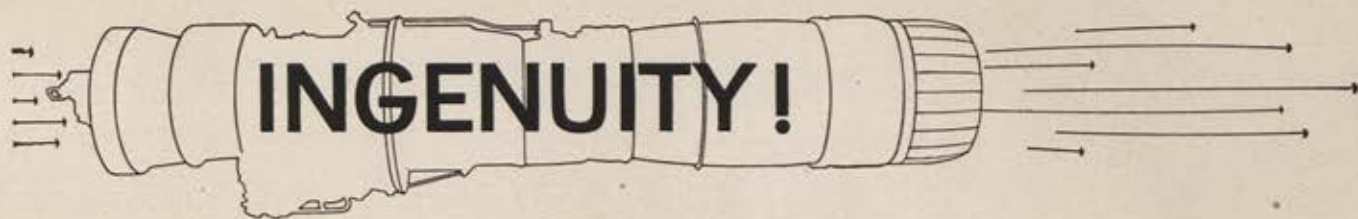
J-91057



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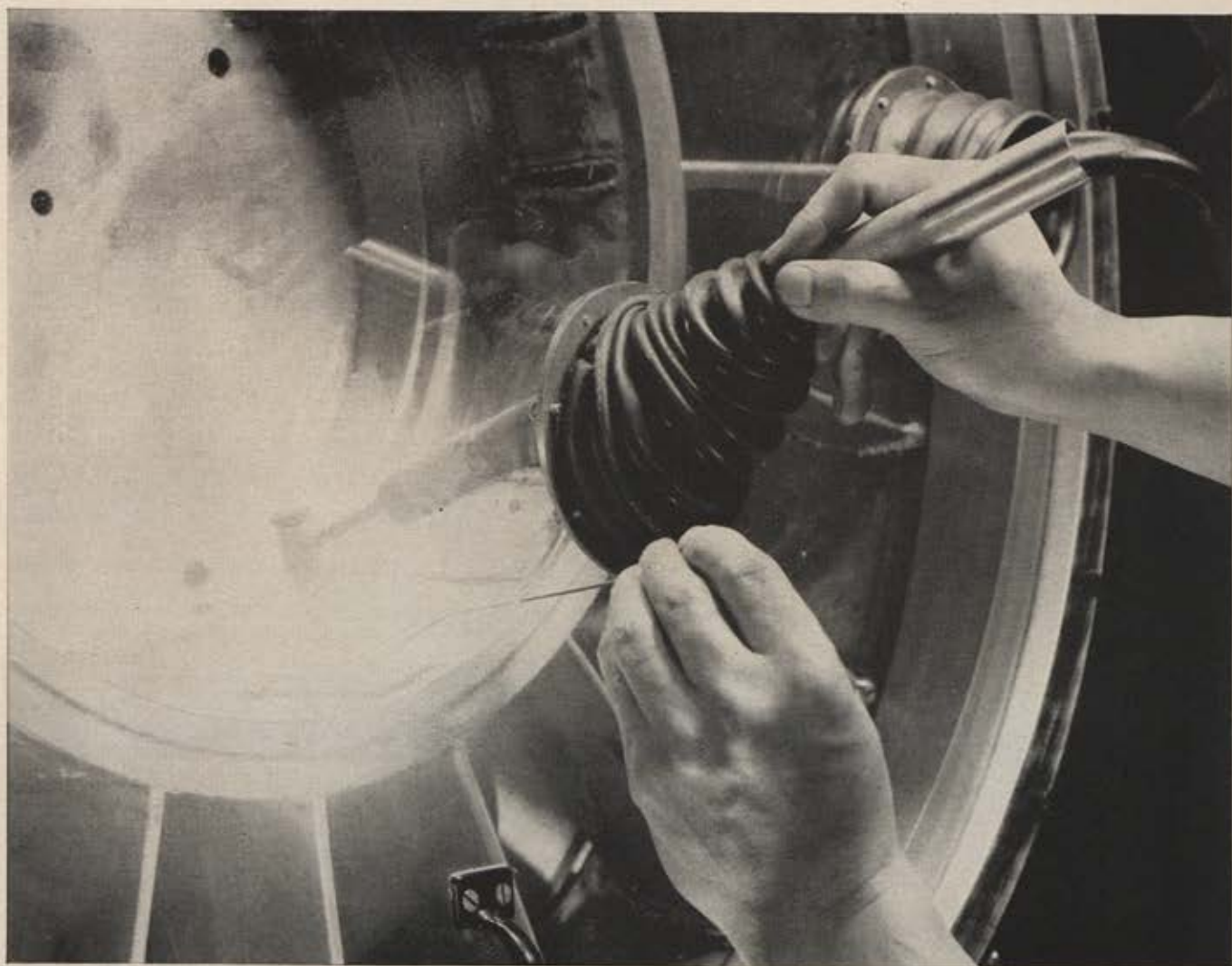
Our engineering and production specialists are constantly examining production methods to determine if new ways can be found to increase

the quality of the job and, at the same time, lessen production time and cost.

In some instances, we have sliced production time in half on certain manufacturing operations of the J57. Of course, it takes skill, experience . . . and *ingenuity*.

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AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

Volume 40, Number 10 • October 1957

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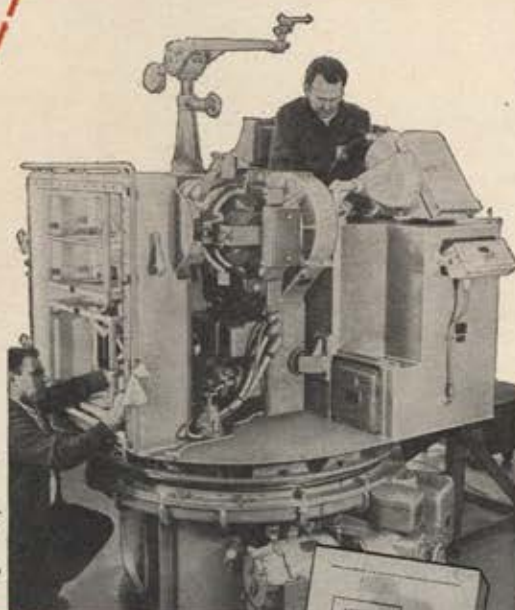


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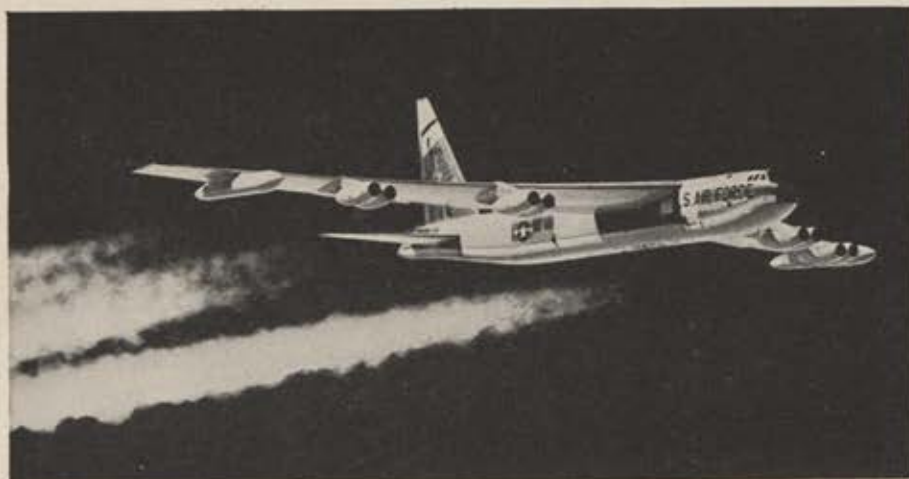
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BULLETIN FROM **BOEING**



BOEING KC-135 JET TRANSPORT-TANKER—now being delivered in volume to the Air Force. The KC-135 gives the nation's jet bombers and fighters virtually unlimited range—and brings refueling up to jet-age standards of efficiency, speed and altitude.



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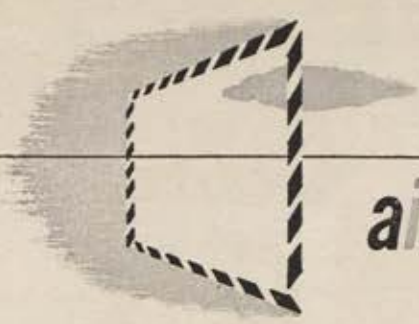


UNDERWATER IN A GIANT TANK, a Boeing jet aircraft body undergoes tests simulating more hours of pressurized flight than any airplane has ever flown. Benefits of such advanced research will be yours when Boeing 707 goes into service, early in 1959.



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air mail

MATS Safety Record

Gentlemen: I would like to compliment you on the MATS story "Global Airlift," in your August issue. It is well written and a very informative article.

It was gratifying to read your account of the MATS declining aircraft accident rate and, in particular, your reference to the worldwide accident insurance protection afforded MATS crew members and passengers on scheduled transport flights; however, I feel that your remarks are misleading when you imply that the insurance protection was prompted by the record low 5.12 accident rate per 100,000 flying hours. The accident rate quoted includes many diversified flight activities, as you point out, of which only one is air transport operation. The insurance is actually based on a much lower MATS scheduled transport rate which, in 1956, was 1.66 accidents per 100,000 flying hours, and for the first six months of 1957 was 1.09. Those reading your article who are familiar with commercial air operation would consider a rate of 5.12 as extremely high and completely out of line with the experience of the commercial airlines.

The MATS transport accident rate has been declining for many years and is now at the lowest point ever recorded in the history of MATS. We believe that this progress in air safety is directly related to the safety standards under which we operate and stems from the fact that our transport crews are professionally qualified to perform exacting tasks even under emergency conditions. This was recently exemplified when Major Tyson and his crew of fifty-seven passengers aboard a C-97 Stratocruiser experienced an extreme emergency on August 8 en route to Honolulu, and flew for approximately six hours on two engines.

Lt. Col. Malcolm W. Seab
Asst. Chief
Office of Safety, MATS
Washington, D. C.

Hard Cover Coming

Gentlemen: I know you're glad the Golden Anniversary edition of the

magazine is behind you, and I want to add my congratulations to the many I know you've received.

The organization and editing are superb. It's a real collector's item, and I hope you carry through on the idea of getting it out between hard covers. It will make a lasting, authoritative reference for anyone concerned with aviation.

W. A. Hawkins
Nashville, Tenn.

● *We are publishing a hard-cover version which will be along in about a month. Watch our November issue for details.—The Editors.*

Booster From Biloxi

Gentlemen: I wish to take this means of congratulating you on the wonderful Golden Anniversary issue dedicated to the US Air Force. I have just completely finished the issue clear through page 460. Needless to say, it was good to see Keesler AFB, located here within the city limits of Biloxi (a pre-Pearl Harbor installation), included.

The history of the Air Force was most interesting, and especially the scores of well-chosen pictures. Your entire staff is to be congratulated on this issue, which is no doubt the greatest single publication in the history of airpower to appear to date.

As a member of the Air Force Association, I am mighty proud to read Air Force Magazine each month.

Anthony V. Ragusin, Gen. Mgr.
Biloxi Chamber of Commerce
Biloxi, Miss.

Father's Picture?

Gentlemen: The Golden Anniversary issue, August 1957, contained on page 92 a picture that I am certain was that of my father, Jesse Taylor, Jr. The picture is identified as having been procured from Bettmann Archive and shows a scene from an American bombing school from World War I. My father was a sergeant in the Aviation Section of the Signal Corps during World War I and was a specialist in armament. Perhaps the striking resemblance of my father to the soldier on the left-hand side of

the picture is influenced by the fact that they are engaged in handling the armament on a plane. This makes the recognition more logical. I would appreciate it if you could possibly identify the persons in the picture and tell me how I may procure a reprint.

Let me congratulate you on this issue of the magazine for its splendid coverage of the history of the Air Force. During World War II I flew Mustangs in the European theater while my brother flew Corsairs in the Far East. As you can see by this, we are an Air Force family. Your efforts in assisting me to obtain identification and a reprint will be appreciated.

Maj. Robert G. Taylor
Pittsburgh, Pa.

● *Identification and a print of this picture will have to come from our source, Bettmann Archive, New York City.—The Editors.*

Too Partisan?

Gentlemen: For what it is worth, I suggest that a little less partisan treatment in your editorial policy and in your articles in general would increase the effectiveness of your magazine. This is merely one man's opinion and the facts are obviously more discernible from your position.

Regardless, you have my complete support. Keep up the good work!

Lt. Col. Louis B. Cole
Montgomery, Ala.

Milton's AF

Gentlemen: In your July issue, the well-written story "Milton Caniff's Air Force" brought back some fond memories and also forced me to write you some facts that might interest both Mr. Winchester and Mr. Caniff.

I refer especially to that character Lt. Charles Charles, and for the following reasons: My name is Bennett Bennett, and my home originally was in Boston, Mass. I've never smoked anything but a pipe (and still do). I was in the Fourteenth Air Force, 5th Fighter Group, Chinese-American Composite Wing, which group was at the most forward base during the

(Continued on page 10)



"...for service over and above THE LINE OF DUTY"

Hayes Aircraft has completed the company's first year of inspection, overhaul and maintenance of United States Army's 500 helicopters and fixed-wing aircraft at the Army's huge aviation school at Fort Rucker, Alabama, — and the contract has been renewed.

"Service over and above the line of duty" is synonymous with established policies of Hayes Aircraft. In our line of duty at Fort Rucker we simply put into operation our efficient cost control system, our quality control methods and streamlined management policies, as developed and practiced during our years of experience in engineering, modifying and maintaining thousands of aircraft for another Hayes customer — the U. S. Air Force.

Hayes has not received any formal citation in recognition of service rendered during our first year's dealings with the United States Army. But we like to believe that the integrity of Hayes Aircraft Corporation has been recognized in a more material way — renewal of our contract for daily inspection and maintenance of all aircraft at the Army's mammoth training center at Fort Rucker.



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Firewel is establishing an enviable record for dependable oxygen breathing equipment . . . regulators, cylinders, special systems for all high altitude pressure suit flights.

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China campaign. This group operated tactically under Gen. "Casey" Vincent. I was in Group Operations and can recall visits by General Chennault and General Vincent. I was in India when Col. Phil Cochran stopped at our base on his way to Burma.

I thought this might be of interest to Mr. Caniff, but I've always wondered why I was never fortunate enough to see that exciting Dragon Lady.

Bennett Bennett
Beverly Hills, Calif.

Gentlemen: Enjoyed very much "Milton Caniff's Air Force" which was published in the July '57 edition of AIR FORCE Magazine.

Although I cannot qualify in answering Caniff's IQ, I'd like to say that the article answered a long-time belief of mine. I was a member of the 142d which was redesignated the 96th FIS on November 1, 1952, at which time the 142d was inactivated. However, I believe Maj. David F. McCallister (USANG) was then a captain or promoted to major at the time of the redesignation. If I'm not mistaken he was the operations officer of our organization, and without regret I was the Officers' Records Clerk. There was a rumor that Captain "Mac" was portraying Col. Soup Davey in Caniff's comic strip; however, nothing to back the rumor. Thanks to Mr. Winchester, a question in my mind for the past five years is at last answered.

Thank you for the fine articles in our AIR FORCE Magazine.

S/Sgt. Jerry K. Weston
APO, San Francisco, Calif.

Gentlemen: In looking through the July issue of your magazine, I came across a serious error in the comic drawing of the female CAP cadet on page 42, and on the front cover. She was wearing a senior hat patch on her flight cap. The cadet hat patch is a pair of white wings with a red propeller passing through the center. A cadet wearing observer wings wouldn't last very long in any CAP squadron while wearing a senior (prop and triangle) hat insignia. A cadet with an observer's rating would have to be in CAP for at least a year and would definitely know better than to wear the uniform improperly.

S/Sgt. Peter Jorgensen, CAP
Arlington, Mass.

• Milt C. tells us Sergeant Jorgensen is perfectly right about the flub he caught in the hat patch. Fortu-
(Continued on page 12)



"HOT STUFF" coming through...

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the research and production facilities to make all this a protective reality today. Its Advanced Electronics Center at Ithaca, New York, has an INFRARED Projects Group staffed by recognized authorities on IR development. INFRARED by LMEE... with its broad applications to Airborne Weapons Control Systems... is another LMEE contribution to new uses of Defense Electronics. For information on IR... write Section A.



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FRENCH ROAD, UTICA, NEW YORK

nately, Milt discovered this error when the magazine first reached him and in time to include the proper insignia in the drawings for this comic sequence. —The Editors.

Retirement Law

Gentlemen: I have come across a ruling, or an error in writing a retirement law, which is so unreasonable that I hope you can give it some publicity and assist in correcting it.

This happens to be my own case. I was retired this spring, at age sixty, under Public Law 810, 80th Congress, having served as a reservist in World War I, World War II, and Korea, with only about eleven years' total active duty.

I was retired from the Air Force as having no disability but took the routine Veterans Administration examination to set up a case number should it be necessary later.

The VA examination determined that there were two conditions which were service-connected and that I should be entitled to disability compensation at the rate of \$33 per month. However, as I am now in receipt of retired pay of \$214.53 per month, under the above Public Law 810, I would have to waive "all" of this amount to receive this \$33. I, of course, went back to the VA here to check that interpretation and they verified it again.

Veterans retired under other laws receive two checks, one from the VA and one from the Air Force. The latter is their original amount less the VA payment which, being for a disability, is tax exempt.

Have you any information on this ruling or is there anything that can be done about it?

Lt. Col. Charles D. McCabe,
USAF (Ret)
Brooklyn, N. Y.

• Veterans Administration says you would have to waive the retirement check to collect the disability check. Only recourse would seem to be to sue in the Court of Claims. If successful, the effect of the Court of Claims ruling would be to require the VA to interpret your situation the way you want it interpreted, i.e., you collect two checks, one for \$33 from VA, which is tax exempt, and the other for \$181.53 from the Air Force, which is taxable. —The Editors.

Civilian Story

Gentlemen: Mr. Albert H. Wetzel, in a letter appearing on page 10 of the July issue, suggests that more articles and stories about Air Force

personnel would be interestingly welcome.

One hundred pages later, and following your usually excellent coverage of other subjects, an AFA objective reads: "To assist in obtaining and maintaining adequate manpower for national security and world peace."

And who will contribute to meeting this objective? As Mr. Wetzel expresses it, "... the very backbone of this mighty military machine ...," men and women of the United States Air Force!

Mr. Wetzel's request couldn't have been more proper, basically—but he should have gone further. The role of the civilian employee in the Air Force is significant. As an integral part of the total working population, there are civilian careerists whose accomplishments, performance, and futures, if told, would do much to inspire and motivate the employable, the young, would-be-engineers, scientists, and technicians, the men and women whose training and experience might well be better utilized in the Air Force.

Stories of the civilian men and women of the Air Research and Development Command would be especially effective. Theirs is a challenge—to insure supremacy of USAF's airpower. Theirs is a part of a team—government funding and government direction; development by industry; engineering and production ability; and the knowledge of science—all of them indispensable when today's technological advancement is measured in terms of geometric progression. Theirs is a story of career opportunity in the ARDC—a story which would partially offset the prohibition on paid advertising for civilian recruitment purposes.

Mr. Wetzel's suggestion is an excellent means of meeting a signal AFA objective to maintain adequate manpower for national security and world peace.

Webster F. Russell
Baltimore, Md.

Our Pleasure

Gentlemen: I can't help but feel that I would be denying myself a little personal satisfaction if I did not take advantage of the occasion of my yearly renewal of AFA membership to compliment you on the excellent job you are doing and tell you how much I enjoy Air Force Magazine. It was always tops, but is now better than ever.

John P. Castelli
Arlington, Mass.

RADAN IS READY

• RADAN

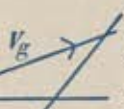
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- RADAN — virtually maintenance-free

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RADAR THAT PUTS THE FINGER ON STORMS

Man's newest ally in his eternal battle with the elements is Raytheon Storm Detector Radar. Already, military versions of this radar are providing invaluable help in tracking destructive storms and in issuing timely advance warnings. Next year 39 new units are scheduled to keep watch around-the-clock for the U. S. Weather Bureau.

Each radar pinpoints storms in a 300,000 square mile area, "sees" drizzle, snow, fog or probes deep into the heart of a rain-lashed hurricane.

Here is another example of how military and civilian electronics are teaming-up to help safeguard America.



Excellence in Electronics

RAYTHEON MANUFACTURING COMPANY, WALTHAM 54, MASS.



The Reds hope this will eventually mean the opening of commercial flights between the USSR and the US. This is the twin-jet Soviet TU-104 airliner that landed last month at McGuire AFB, N. J., carrying UN delegation members to New York.

Wide World Photos, Inc.

■ Reports from Cape Canaveral, Fla., indicate that the testing and firing stand to be used in launching the US earth satellite is now ready. Designed to withstand temperatures of 4,000 degrees Fahrenheit, heavy shock, and vibration, the stand will be used to weigh and measure the thrusts of many captive Vanguard rockets before it is actually used as the takeoff platform for the real thing.

There is no word from Washington on expected launching dates, and, on the other side of the world, the Russians are not saying much more than that their satellite will be ready for firing "soon."

Incidentally, the speed of the US satellite, once in its orbit, will be so great (18,000 mph) that a superfast IBM device will be used to track and predict its path for spotters. Data from the IBM machine, to avoid any chance of error, will be transmitted three times via teletype.

■ US retaliatory potential got a boost in late September as 1,000 airmen moved from temporary headquarters in Madrid to what will be the largest air base in Spain—at Torrejon, fifteen miles northeast of the Spanish capital.

The personnel transfer, accomplished quietly and with little publicity, will be followed by shipment of planes and other equipment of the Sixteenth Air Force from Spain's Getafe airport, south of Madrid, which USAF has been using jointly with the Spanish air force.

The Torrejon base, equipped with the longest runway in Europe, will have its own electric power, heating, and water-purification plants, like the three other major installations being developed in Spain, at Zaragoza in the north and at Moron and San Pablo in the south.

■ Airpower was very much on the agenda of Secretary of Defense designate Neil H. McElroy as he toured military installations and defense plants in recent weeks to familiarize himself with his new job. His itinerary included: SAC Hq., Omaha, Neb.; CONAD Hq., Colorado Springs, Colo.; Western Development Division, ARDC, Los Angeles; Edwards AFB, Calif.; Kirtland AFB, Los Alamos, Holloman AFB, and White Sands Proving Ground, N. M.

■ At this writing, Houston's Tom McMurray, Jr., a USAF veteran, was readying for his flight from there to Rome, via New York, in an attempt to set a new nonstop distance

record for light planes—a record now held by Bill Odom, with 4,957 miles. The Houston-Rome run is 5,500 miles.

From Rome, McMurray will set off in his Mooney Mark 20 four-seater for a globe-girdling flight back to New York in an effort to set the first official round-the-world speed record, since, strictly speaking, there is no official record of a circumnavigation flight under auspices of a recognized aviation authority.

Packed with extra gas tanks, McMurray's Mooney craft is capable of a usual maximum speed of 170 mph, and—whether it takes him eight or eighty days around the world—his record will be an official one.

■ Amid mild lamentations in the British press, Queen Elizabeth will fly the Atlantic here and home on her visit
(Continued on following page)



For his record-breaking 102,000-foot balloon ascent, Air Force doctor, Maj. David G. Simons, has been awarded the DFC. He took this picture of himself at peak of his climb.



Now in MATS service out of Dover AFB, Del., is the giant new Douglas C-133 four-engine turboprop transport. The new carrier, which has a wingspan of 179 feet, eight inches, can carry payloads in excess of 3,000 miles. Production is in California.

to the US this month in an American-built plane, a Douglas DC-7C airliner belonging to British Overseas Airways.

The official announcement said it had been hoped to use a long-range Britannia but that BOAC had taken delivery on only one and there will not have been enough time for proving flights and crew training for the Queen's flight.

With the Britannia unready, there had been suggestions in Britain that a jet bomber be refitted to fly Her Majesty on the transatlantic flight. After a four-day visit to Canada, she and Prince Philip will fly in an RCAF transport to Jamestown, Va., for a tour of the festival there, before going on to Washington.

■ Activation of the first Air Force Operational Ballistic Missile Division, with headquarters at Cooke AFB, Calif., has been announced by Lt. Gen. Samuel E. Anderson, Commander of the Air Research and Development Command. The new unit will be commanded by Col. William A. Sheppard.

The division was organized under the supervision of Maj. Gen. Bernard A. Schriever, Commander of the AF Ballistic Missile Division (ARDC), to plan and prepare for future operational ballistic missile units. Already activated is the new 704th Ballistic Missile Wing, also at Cooke.

Announcement of the new unit was regarded as a significant step toward creation of actual field units to take over operation of long-range ballistic missiles.

With knowledge presently available on probable components of IRBMs, establishment of training now would assure existence of combat units by the time the weapons start coming off the production line.

■ The USAF's airpower pattern ten years from now was projected in a recent Los Angeles speech by Lt. Gen. Clarence S. Irvine, Deputy Chief of Staff for Materiel at Headquarters USAF.

The 1967 AF will be faster, higher flying, and more lethal than anything now available, including manned aircraft in standard categories with speeds exceeding Mach three and development aircraft reaching toward Mach ten.

"Our missiles," General Irvine said, "flying at [altitudes] of over 300 miles at hypersonic speeds, will be greatly simplified and reduced in size, cost, and ground support requirements.

"If we have to fight an all-out war in 1967," he said, "we should have adequate quantities of ballistic and air-breathing missiles which will effectively complement our manned bomber force and our fighter-interceptors."

■ New England's biggest fair, the Eastern States Exposition, saluted the USAF on its Golden Anniversary on opening day at West Springfield, Mass., September 14, while the Air Force exchanged greetings with flights of its supersonic Thunderbirds aerobatic team, parades, ground exhibits, music by the hundred-man Air Force Band and the Singing Sergeants, and a show by the HEDCOM drill team. On hand as guest speaker was Gen. Thomas D. White, USAF Chief of Staff.

■ The Air Force reached an all-time low for major accident rate during the first half of 1957 with a record of only fourteen major accidents per 100,000 flying hours. The previous record, set in 1956, was fifteen accidents per 100,000 flying hours.

■ STAFF CHANGES. . . Brig. Gen. Herman A. Schmid, until recently Military Assistant to the Assistant Secretary of Defense (International Security Agency), became Chief, Air Force Section, MAAG, Japan, October 9. . . Orrin L. Grover retired in the grade of brigadier general, August 30. . . Brig. Gen. Ethelred L. Sykes, Assistant to Director of Plans, SAC, assumed duties as Vice Commander, AF Missile Center, ARDC, Patrick AFB, Fla., October 1. . . Brig. Gen. Stanley T. Wray, Chief, Electronics Defense Systems Division, Hq. AMC, reported on September 23 to Wright-Patterson AFB, Ohio, as Commander, Wright Air Development Center.

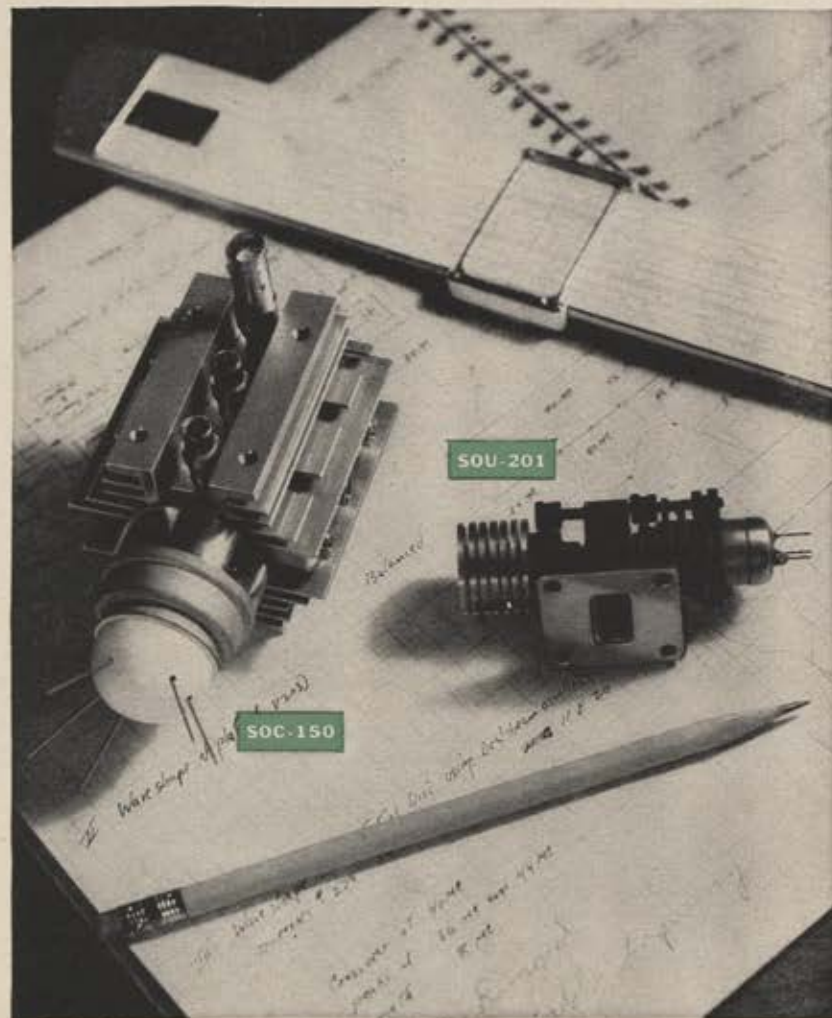
■ PROMOTIONS. . . Lt. Gen. Leon W. Johnson, US Representative, NATO Military Committee, Military Representatives Committee and Standing Group, to rank of general. . . Maj. Gen. Francis H. Griswold, Vice Commander in Chief, SAC, to lieutenant general. . . Maj. Gen. William F. McKee, Vice Commander, AMC, to lieutenant general. . . Maj. Gen. William D. Eckert, Vice Commander, TAC, to lieutenant general. . . To rank of brigadier general, Philip H. Greasley, John E. Dougherty, Charles R. Bond, Jr., Charles M. Eisenhart, Austin J. Russell.

—BILL LEAVITT

New Sperry transponder tubes for missiles and jets offer high signal stability

High-output SOC-150 and SOU-201 klystron oscillators resist shock, vibration, wide temperature swings

NOW AVAILABLE, these new Sperry klystron oscillators were specially designed to withstand the severe environmental stresses generated in high-speed jet aircraft and guided missiles. Both types feature high signal stability and output power. Yet dimensions are held to the compact size required in radar guidance systems designed for the newest missiles. Each individual tube is tested to the extremes of shock and vibration encountered in these applications. Write for application data on the SOC-150 and SOU-201 as well as similar tubes for other frequency bands.



SOC-150

Two-resonator oscillator easily frequency modulated over a frequency range centered as specified by the customer. Symmetrical mode tuned for operation at high ambient and wide temperature extremes.

Frequency	C-band
Beam voltage	1000
Beam current	150 ma
Heater voltage	6.3 v
Heater current	.8 a
Power output	10 w
Weight	18 oz
Dimensions	4 3/4" x 4 1/16" x 4"

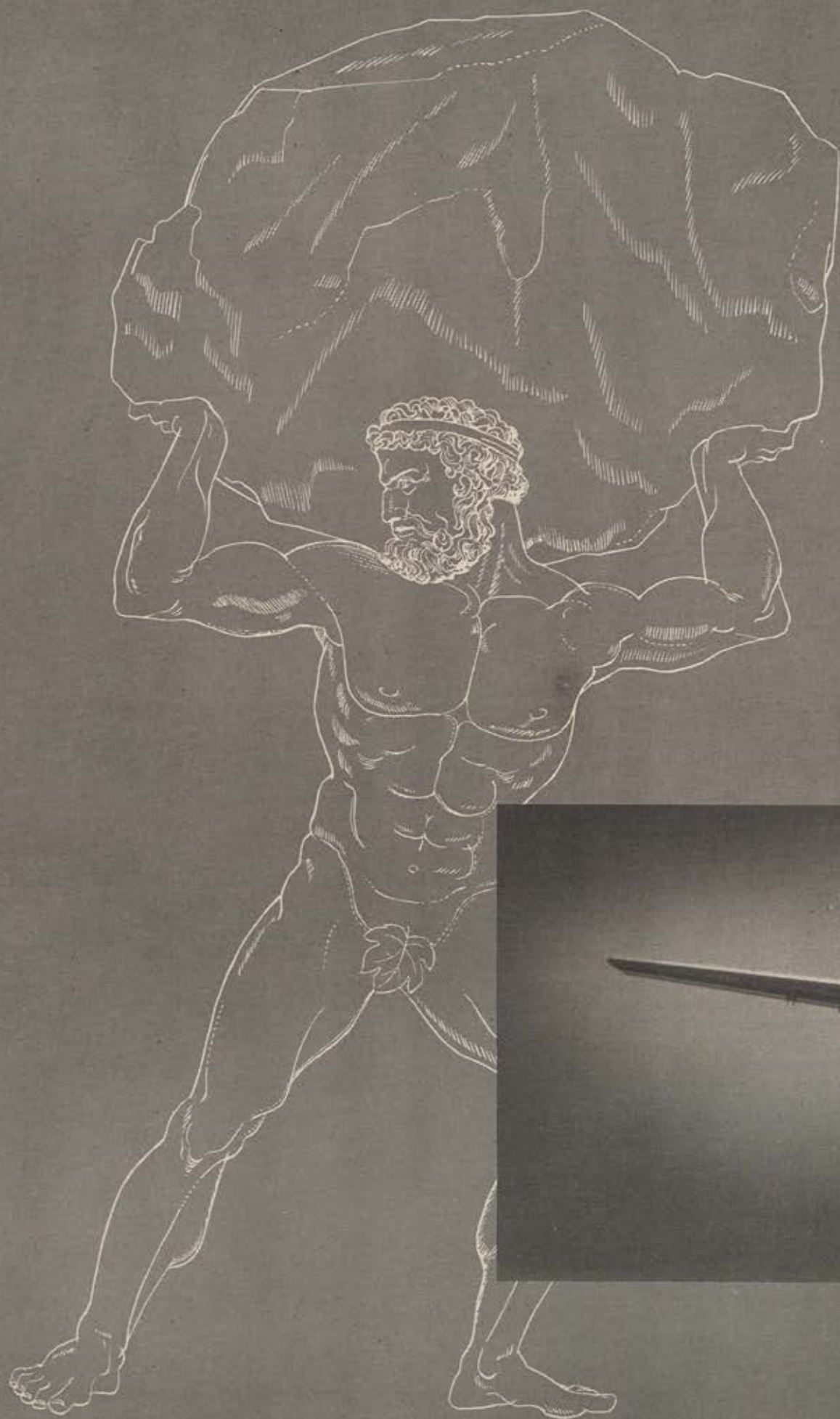
SOU-201

Two-resonator oscillator of block construction with internal feedback for ruggedness and fast warmup. Short tuning struts. Built to comply with MIL5272A. Tuned by varying resonator gap capacity through semi-flexible diaphragm.

Frequency	13.5 ± 0.1 kmc
Beam voltage	1600
Beam current	128 ma
Heater voltage	6.3 v
Heater current	1.5 a
Power output	15 w
Weight	8 oz
Dimensions	3 1/2" x 1 3/8" x 1 3/8"

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DIVISION OF SPERRY RAND CORPORATION
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ANNOUNCING THE NEW LOCKHEED

HERCULES

—the 3,500-mile jet age air
freighter designed to serve the
transport needs of all
branches of the U.S. Armed Forces

The new Hercules C-130B is a logistics version of the performance-proved C-130A—which has performed impressive feats with the Tactical Air Command.

Powered by four 4050 h.p. Allison T-56 prop-jet engines, the Hercules can carry 25,000 pound loads 3,500 miles, at cruise

speeds over 300 knots (or carry 35,000 pounds for 2500 miles).

The first jet age aircraft specifically designed for air freight, the new Hercules has a huge rear door and integral loading ramp—enabling it to swallow whole truckloads at a gulp. No other cargo plane in USAF operational service can match the Hercules in fast loading and unloading—of all types of cargo, no matter how big or heavy.

Among the Feats-of-Hercules is taking off from or landing on short runways and improvised fields, fully loaded. Wherever our Armed Forces go, the great new Lockheed Hercules will get there in a hurry with whatever cargo is needed to support operations.

GEORGIA DIVISION, *Lockheed Aircraft Corporation, Marietta, Georgia*



LOCKHEED *means leadership*

wing tips

By Wilfred Owen

Pan-American Grace Airways recently completed its 25,000th crossing of the Andes, highest mountain range in the Western Hemisphere.

Jet-propelled "ghost airliners" are crossing the Atlantic and flying from New York to Venezuela every day. These imaginary flights are planned as carefully as the real thing, to find out as much as possible about winds, temperatures, and storms up to 53,000 feet for next year's jet service. Knowledge of the "jet stream" may add 100 to 150 miles per hour to jetliner speeds.

More than eighty commercial helicopter operators are doing business in the United States and Canada with 400 helicopters.

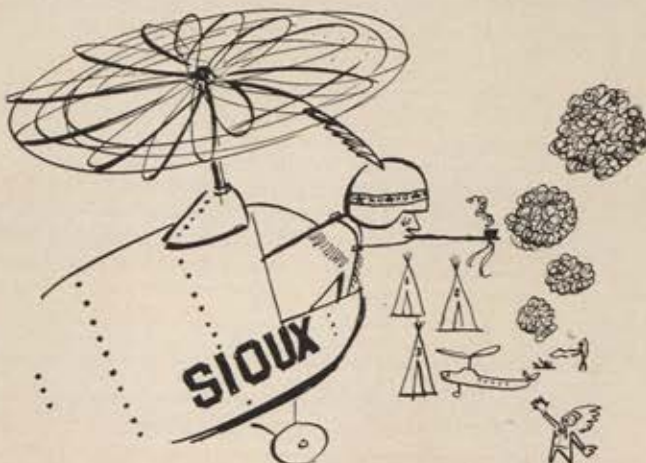
Australia's Qantas Empire Airways has flown four tons of aspirin tablets to Bangkok to replenish supplies exhausted during the Asian influenza epidemic.

The world's largest balloon has lifted a record two tons of equipment and instruments twenty miles into the air,

according to the Air Force Air Research and Development Command.

An airline traveler may soon be able to telephone home en route to announce his arrival. Michigan Bell and Illinois Bell Telephone Companies are experimenting with air-to-ground phone service on the airlines between Chicago and Detroit.

In place of numerical designations the Army is naming its helicopters after Indian tribes. The 'copter family now



includes the Seneca, Sioux, Chicasaw, Choctaw, and Shawnee. A flying platform has been named Pawnee.

One hundred million airmail postal cards have been produced by the Government Printing Office since the 4¢ card was introduced eight years ago.

The Army's Flying Platform



The Air Force X-18, now under construction



Hiller research is now directed into three broad categories: helicopters, ducted fan aircraft, and tilt-wing propelloplanes.

The Marines' XROE-1 collapsible Rotorcycle



Atomic Age Demands Preparedness... MORE MOBILITY

Never before in history has mobility meant so much to military planning and tactics. No wonder all the services, particularly the U. S. Army, look to the air—and VTO*—for the only road to revolutionary progress.

* Vertical Take Off

Engineers: write for opportunities with an industry leader in an ideal California locale.



HILLER HELICOPTERS
PALO ALTO, CALIFORNIA

Hiller Helicopters has one objective in its many research programs for the Army, Navy and Air Force: to transform ideas for better VTO aircraft, capable of widespread practical applications, from dreams to reality in the shortest time possible.

IN ANY ATTITUDE
THE F-105

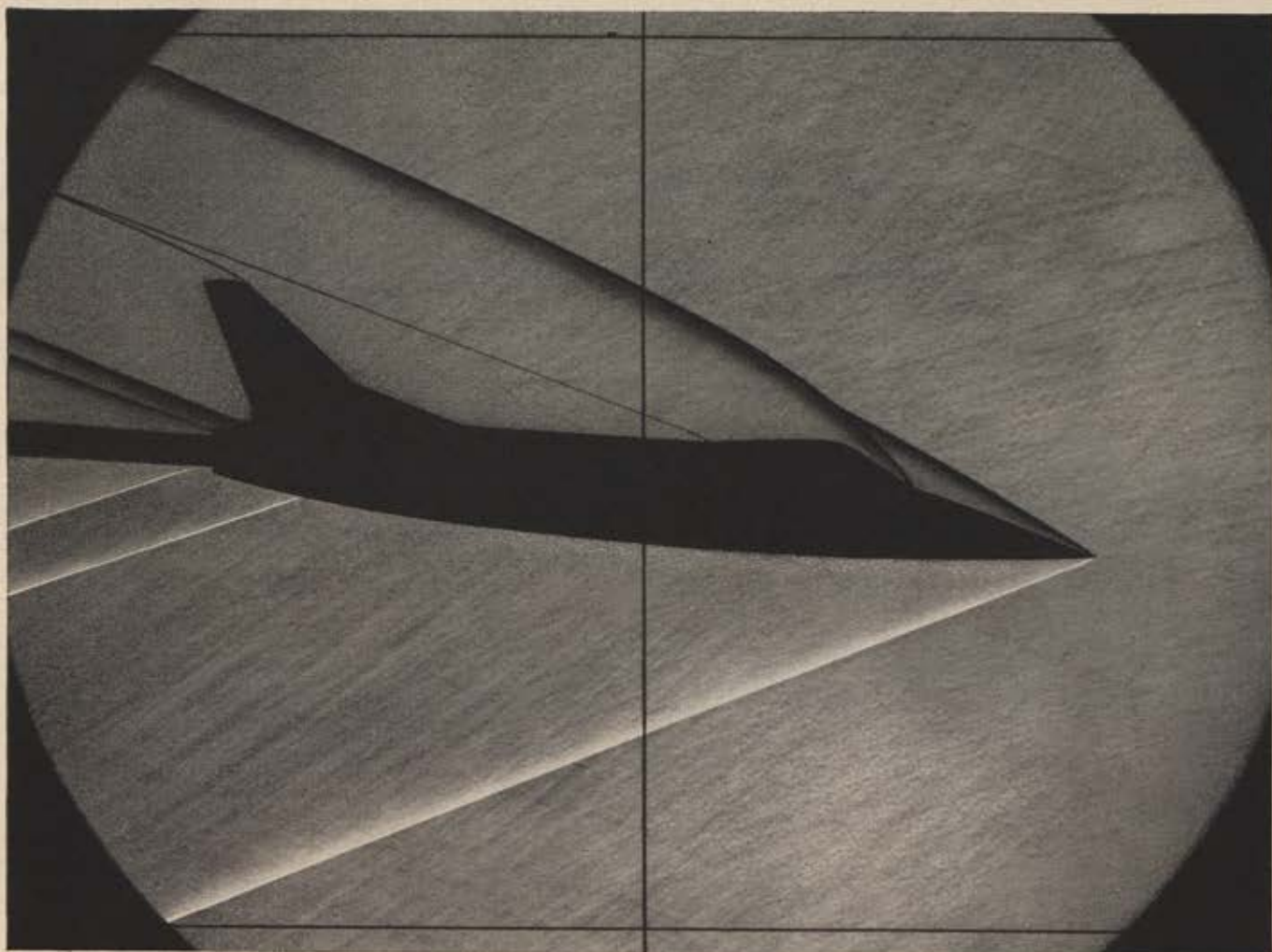


Streaking skyward or racing along "on the deck" . . . able to intercept or retaliate against an aggressor with powerful agility . . . the new Republic F-105 Thunderchief fighter-bomber brings to the United States Air Force a devastating weapon for defense.

REPUBLIC  **AVIATION** 

FARMINGDALE, LONG ISLAND, N. Y.

Designers and Builders of the Incomparable **THUNDER-CRAFT**



Schlieren photograph of supersonic flight patterns in wind tunnel.

There is a formula for supersonic supremacy

Supersonic supremacy is the absolute condition of America's future security. It is a day-to-day thing. It must grow with major new advances; it must be strengthened by aircraft that fly much faster, much farther and higher.

North American Aviation's vast backlog of experience in the design and production of supersonic aircraft—by far the greatest in the Free World—is concentrated on this unending challenge. There are sound reasons for North American's ability to design superior aircraft with certainty—and to turn them into hardware with speed and economy:

North American designs for performance. The supersonic F-100 Super Sabre exceeded the speed of sound on its first flight in 1953. And there is still no Air Force operational airplane that can match the F-100's tactical and combat versatility, or its endurance—proved by record-breaking non-stops: London to Los Angeles, Los Angeles to New York, and New York to Paris.

North American designs for production. From the beginning, North American's engi-

neers have designed every airplane for rapid, low-cost production. That is why North American can turn a new weapons system concept into a flying reality in the shortest possible time.

North American designs for growing potential. From the basic F-100 design came a brilliant series of new versions—the F-100A, C, D, and F—all adapted to special duties without sacrificing speed, range, altitude, or payload ... or spending the years and millions normally required for new designs.

North American designs for the future. The X-15 rocket plane, now in production, will carry man higher and faster than ever before. Other major supersonic projects now in advanced development include a long-range interceptor for the Air Force at North American's Los Angeles Division and the A3J, a carrier-based attack weapon system for the Navy, at the Columbus Division.

The formula for supersonic supremacy in the future is supersonic experience today. North American has it.

NORTH AMERICAN AVIATION, INC.

Los Angeles, Fresno, Canoga Park, Downey, California; Columbus, Ohio; Neosho, Missouri.

NORTH AMERICAN HAS BUILT MORE SUPERSONIC AIRCRAFT THAN ALL OTHER COMPANIES COMBINED



What's New With



RED AIRPOWER

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

The Russians have developed another new helicopter, albeit a small one. It has an empty weight of 1,800 pounds and a flying weight of just under 3,000 pounds. Top speed for the two-place machine is 100 mph and normal operating speed is seventy. It has a range of 230 miles and a ceiling of 13,000 feet. The designer is an engineer named W. Winicki, and the helicopter is powered by a 260-hp AI-14 engine, a powerplant of Polish design.

Maj. Gen. Heinz Kessler is the new Deputy Minister of Defense for East Germany.

The Russians no longer are hinting. They now say definitely that they will send up an earth satellite during the International Geophysical Year.

Launching of such a satellite will clearly indicate to the world that they now have the capability of producing intercontinental ballistic missiles.

This also fits in with the speeches of Zhukov and Khrushchev over the past fifteen months. They have been full of talk of long-range missiles and rockets. Khrushchev, in a speech in Berlin on August 8, included this sentence as a warning: "The statesmen of the United States should consider that, in our time, when rocket technology is developing rapidly, no country, no matter how remote, is safe."

Those confusing Soviet aircraft designations aren't really as confusing as they seem to be.

One good rule of thumb is that odd-numbered aircraft are fighters or interceptors, while even numbers apply to other types, including bombers and transports. No particular pattern has been identified with helicopter numbers.

The Soviet Air Forces use numbers of their own choice to designate different aircraft; the various aircraft designers use a series of their own for nonmilitary types. This leaves great spans of blank numbers between different nonmilitary types turned out by designers.

For example, O. K. Antonov's AN-2 (Colt) design is well known. His most recent design, the turboprop transport dubbed Ukraina, is an AN-10. His AN-8 was the transport described in the July issue of this magazine.

But what are the AN-4 and AN-6? Not mysterious aircraft, as some might suppose. They are special versions of the AN-2 turned out by Antonov and his group. One is a floatplane version, the other a weather plane used in the Far North.

The military and designer numbering system accounts for the spread between the TU-104 and the TU-110, the two Tupolev transports. Between these two there perhaps are military types that may carry designations as low as TU-20.

The Soviet earth satellite, when it is launched during the International Geophysical Year, may have been made possible by new materials and a new fuel for its rocket engine. This is the broad hint given by the President of the USSR Academy of Sciences, A. N. Nesmeyanov, in an interview he gave in June.

Russians use a lightweight radio altimeter on nearly all of their aircraft, including helicopters. It appears on all civil transports and is especially helpful at low altitudes, such as during landings when visibility is poor.

As part of its program of decentralization, the Soviet government is setting up a Siberian Division of the USSR Academy of Sciences on the banks of the Ob River, near Novosibirsk in western Siberia. About 1,800 acres have been set aside for the new division, which will have several institutes, some of which have not yet been named, but including a Mathematics Institute with a computation center, and a Mechanics Institute. One of the two men who will set up the new division is S. A. Khristianovich, who has been head of the Department of Technical Sciences of the USSR Academy of Sciences. His department has worked on many of Russia's most important missiles, aircraft, and powerplant problems.

The Soviets now make two flights a day between Moscow and Magadan, the important Far Eastern Soviet military base on the Sea of Okhotsk, according to the latest Aeroflot schedule. Magadan is a major supply point for Soviet air bases nearest the US.

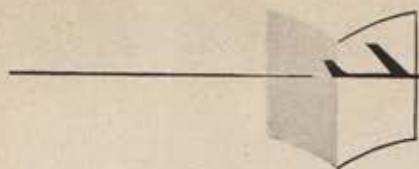
How defense and industry are tied together in Russia is well illustrated by an official Soviet announcement given out as part of the decree decentralizing control over industry in that country. The decree combined the Ministries of Machine Building and Defense Industry under the title: Ministry of Defense Industry, which now will control the combination. This clearly shows that a great portion of the production under the former Ministry of Machine Building actually was for defense and will be continued for defense, despite peace talk.

There is nothing that is equivalent to the Air Force Association in the USSR. Perhaps the closest thing is the group which supports the Frunze Central House of Aviation and Antiaircraft Defense—the so-called Air Museum in Moscow.

The Air Museum is kept going by public contributions, both of money and materials—the latter including the various aircraft, models, and engines on display there. A large group of elder figures in aviation, including military and civil flyers, aircraft designers, engineers, and other specialists all belong to the organization.

However, one thing the group has set itself up to do is all bogged down in an internecine fight over fact. The fact concerns the early contributions of the USSR to heavier-than-air flight, i.e., the airplane supposedly built by Mozhaisky and flown in 1882. Some of the members of the organization believe the story, others do not—and there the matter rests.

Meanwhile, because of the fight, one of the prime purposes of the group—to promote greater knowledge and understanding of Russia's early contributions to aviation—isn't being carried out, according to complaints in *Red Star*, the Soviet military newspaper.—END



airman's bookshelf

By three o'clock on the afternoon of August 1, 1943, the thoroughly practiced, thoroughly memorized mission plan for a surprise attack on Ploesti—pulsing heart of the Nazi war machine—had gone completely awry.

Confused waves of bomb-laden AF B-24s sweeping low across the fields of Romania converged onto a waiting target at altitudes as low as twenty-five feet. Unfortunately, they had been well announced in advance because of a tragic accumulation of operational miscues and human errors.

Early that morning 1,750 airmen in 194 of the Consolidated "heavies" had taken off from Benghazi Air Base in Libya. By late that night some had returned to Benghazi. Others scattered to landing fields throughout the Mediterranean. About one-third of the armada never made it back at all. Neither did 440 airmen, while another 200 wound up in German POW camps. Turkey interned seventy-nine. Out of Ploesti came five Congressional Medal of Honor winners—the largest from any one single military operation in US history.

Low Level Mission: The Story of the Ploesti Raids, by Leon Wolff (Doubleday, \$4.50), relates this tragic epic in vivid journalistic style, recreating it mainly from unclassified official records and personal interviews.

Ploesti was one of two special air operations—extraordinary blows against the German war economy—listed in the Combined Bomber Offensive Plan of May 1943. (The other was against the German fighter complex in southern Europe.) The job was given to Gen. Lewis Brereton. Several Eighth AF B-24 units were transferred from England to North Africa especially for the mission. The plan called for a low-level attack—thought to be the most damaging and most likely to effect surprise. Since no fighter had the range needed, the B-24s had to go it alone. Low-level flight would partly offset the disadvantage of no escort as well as enable the attack force to slip under enemy radar. Crews meticulously practiced on a model target built in the desert, memorized every detail.

Shortly after takeoff, aborts began. Eleven dropped out as the vast formation crossed the Mediterranean, including the lead navigation ship. Its place was taken by Col. Keith Compton, flying the mission commander, Gen. Uzal Ent, and an inexperienced navigator. High cloud formations split the armada. Col. "Killer" Kane led his 96th Group under while others climbed over the top. And the time factor, so important in a surprise mass-formation mission, went off kilter. Shrouded in radio silence, the formation elements quickly lost contact with each other and proceeded independently.

Well into Romania, Compton, leading the 376th Group, misidentified a check point, turned his group for the run to Ploesti and ended up over the suburbs of Bucharest. Blindly following was the 93d Group. Both groups swung left toward Ploesti, but the cat was out of the bag. Alerted German defenses all along the flight path threw up a deadly flak barrage. The same reception met other formations farther north. Air battle organization and discipline vanished. Time over targets could not be met. Briefed approaches were impossible in many cases, and bombardiers took potluck. Squadrons, off schedule, caught the fury of delayed-action explosions. Dense choking smoke from raging oil fires blacked-out target areas. German flak, small-arms fire, dangling balloon cables, and tower-

ing smokestacks hidden in the pall that enveloped the target turned Ploesti into a valley of death. Bombers were seen to penetrate solid walls of fire, emerge white and scorched. A few, mortally damaged on the bomb run, were deliberately and accurately flown into the targets.

Scores of German fighters craftily waited to jump the limping armada on its way home. And beyond the range of the ME-109s and -110s were Italian fighters, alerted and waiting.

Nazi forced labor quickly put Ploesti back in operation. German air defenses were reinforced, and it took a determined Fifteenth Air Force campaign (at high altitude and with fighter escort) operating out of the much closer Italian airfield complex to smash the refineries permanently. This happened late in the war, and the German war machine folded soon afterward.

Wolff, a former AF officer, has written a highly argumentative book, and his account of the mission is the most dramatic and objective portion. It is preceded by two unnecessary chapters tracing the history of airpower from 1918 to 1943. His prestrike discussion of the importance of Ploesti and oil to the Germans and of the first inconsequential air attack on it—the Halverson mission—lays an adequate background for the tempestuous account to follow. The last chapter recounts the ultimate demise of Ploesti at the hands of the Fifteenth Air Force operating from Italy.

But many will challenge Wolff's constant editorializing and moralizing. Typical statements like "Ploesti sent a thrill through the AAF high command . . . a chance to prove their point by means of an episode of unparalleled glamour and high drama," simply are out of place in an objective treatment. And it is this factor which largely takes *Low Level Mission* out of the class of Jim Bishop's or Walter Lord's historical narrative.

There will be controversy especially among those who were there, over roles and responsibilities of the commanders, from Brereton (Wolff's whipping boy) on down to wing and group level.

How did Ploesti tailor into the primary Mediterranean theater objective—to win Italy? How did it fit into the Combined Bomber Offensive's strategic war plans? Who worked out the operational plan, decided on low level? In what political frame was it discussed at Casablanca by the Allied chiefs of state in January 1943 and later at the Trident Conference in Washington in May 1943? What relationship did it have to Operation Husky? Were followup strikes not made because of high losses or because of other strategic consideration? What specific tactical and strategical air operational lessons were learned that contributed to the success of later strategic bombardment missions?

These and other questions the historians and the students of air science will ask. And chances are they won't be answered until the Ploesti records can be far more thoroughly researched.

And sifting out of it will probably come some of the same general conclusions Wolff makes: Airpower is a decisive force in war; there was stupidity in high places; the airmen were brave and bravely led; but it all could have been done much better if there had been more foresight, even clairvoyance.

(Continued on page 27)



3-minute check-out for jets

Our system for testing guided missiles before launching can be applied with equal practicality to checking the standby readiness of jets.

With an adaptation of test equipment we have already produced, *one man* will be able to check out a jet in *three minutes*. This application to jets is now only a matter of cooperative development.

The system will be compact and mobile and will utilize the latest digital and analog control system techniques. Test sequence and acceptance limits will

all be programmed in advance. An "umbilical" cord will be used for plug-in connection to an associated output jack on the aircraft.

The system will automatically perform the tests, evaluate the responses, and—in three minutes—either check out the plane for flight, or call for replacement equipment.

We would welcome the opportunity to discuss application of these techniques to any similar testing problem.



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





SPLIT-SECOND MISSILE CONTROL AT 15,000 MILES PER HOUR

BURROUGHS GROUND AND AIRBORNE COMPUTATION

"THINKS" FAR AHEAD OF SUPERSONIC MISSILES

Eye-defying speeds characterize today's ballistic missiles, and their effectiveness depends on accurate guidance.

That means electronic computation—and *telemetering*, which now keeps ground guidance control instantaneously informed of what's going on within and around the missile in flight: directional variances, atmospheric density, propulsion performance and so on.

Electronic computation, telemetering, high-speed read-out devices for airborne control or ground missile guidance . . . all are identified with Burroughs in today's vital defense contracts. From initial research to actual installation and field services Burroughs participation extends to instrumentation, control systems, communications and other facets of electronic computation.

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THE FOREMOST NAME IN COMPUTATION

We can't say too much about a book that makes people think seriously of the impact of global nuclear war. Such a book is Nevil Shute's *On the Beach* (W. R. Morrow, \$3.95), a current "must" on Capitol Hill and a national best seller. This frightening, realistic novel, from the pen which predicted the London blitz in *Ordeal*, is set in the post-World War III world.

It is a Russian-NATO war lasting less than thirty days and featuring an exchange of 4,700 (according to seismic records) atomic, hydrogen, and cobalt-center bombs, converting the northern half of the world's atmosphere into a radioactive mass. All life north of the equator quickly perishes with radiation sickness. Slowly this blanket of death drifts into the southern hemisphere. Shute sets his stage in Melbourne, Australia—last outpost of life on earth. The story begins in January 1963, and centers around four main characters—an American atomic sub commander, Dwight Towers, USN; Peter Holmes of the Royal Australian Navy; Mary, his wife; and Moira Davidson, a close friend of the Holmes'. With the gripping story of their last days on earth, Shute spins a weird pattern of realism and logic out of fact, imagination, and science fiction.

Here in Melbourne, the people adjust themselves to the inevitable—the arrival of the radioactive air, expected on September 1, and bringing a violent and fatal illness. There is no cure—no form of life survives, and death pills are available free. Everyone awaits death calmly, and with a sanity and purpose defying reason and experience.

For drama, suspense, and characterization, Shute's novel is formidable.

The Air Transport Command in southern China in World War II is the locale of a novel by former airman Eugene Brown, *The Locust Fire* (Doubleday, \$3.25). The book reads more like a personal narrative than a novel in its description of the life and duty of C-47 crews flying in support of Chiang Kai-shek's armies. Written with high realism in the first person, the plot is thin although the ending is suspenseful as a sergeant radio operator on a Gooney Bird struggles to bring home his ship and a load of Chinese soldiers on one sputtering engine.

Before he died in 1943 the poet Stephen Vincent Benet said, "If what I am writing today as propaganda

will hurt my reputation as a writer—very well, then let it. It seems to me that the government has as much right to call upon me to use such special abilities as I may have as it has to call upon a chemist to use his. Anyhow, I just can't sit on my integrity, like a hen on a china egg, for the duration. And maybe even if I did, nothing would hatch."

Benet's words spoke for many name authors who wrote about World War II both in and out of uniform, and

the variety, quality, and scope of World War II writing is more and more emerging in anthologies like Charles A. Fenton's *The Best Short Stories of World War II* (Viking, \$5.95). Fenton has collected here a body of largely "unrecognized fiction" that will delight and entertain.

Authors include William Faulkner, Mark Schorer, Ralph Ellison, Josephine Johnson, James Michener, Robert Lowry, Stephen Vincent Benet, Irwin
(Continued on following page)



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Shaw, and James Jones, just to mention a few. Airmen will find several stories of special interest, including Bert Stiles' "Leipzig," and Michener's "The Airstrip at Konora."

New in the Paperback Corner: *Serenade to the Big Bird*, by Bert Stiles (Ballantine, 35¢). The tenth in Ballantine's paperback publishing program, this diary of a thirty-five-mission World War II copilot has become an air classic. A special hard-bound edi-

tion is still available at \$2.75 from the original publisher, W. W. Norton.

Look of the Eagle, by Brig. Gen. Robert L. Scott, Jr. (Ace Books, 35¢). A novel of excitement and suspense about an AF jet pilot and his adventures in the Far East. This book is especially descriptive of modern jet flight.

We Die Alone, by David Howarth (Ace Books, 35¢). The incredible true escape story of a Norwegian air officer returning on a mission of subversion

into his Nazi-occupied homeland. Certainly the finest narrative adventure to come out of World War II.

Earth Satellites and the Race for Space Superiority, by G. Harry Shine (Ace Books, 35¢). A layman's glimpse into what we are doing in rocket and missile research and test and what must be expected in these areas if we are to begin the conquest of space in the next decade. The author is a rocket engineer at the White Sands Proving Ground.

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SWPA vets will enjoy the reminiscences in John Laffin's *Return to Glory* (Angus and Robertson, London and Sydney). Laffin, former Aussie infantryman whose misfortune it was to trudge with the Allied advance toward Japan in World War II, revisits the scenes of Allied air and ground action ten years later. His travels of more than 10,000 miles through Papua, New Guinea, New Britain, New Ireland, and the Solomons form a travelogue woven with names and places as familiar to many Americans as Coke and Coney Island.

While the names remain the same, the places have changed. Bougainville shows the fewest traces of the war, yet the scars remain everywhere, both on the people and the land. From New Guinea to the Philippines the vast quantity of war material left behind has largely disappeared. Acres of parked aircraft, vehicles, and weapons have vanished—reclaimed or taken over by the jungle.

Some of the hundreds of airstrips are still being used by commercial and bush pilots, but the jungle is gradually taking over.

To the natives (largely a new generation has appeared since the war) Japanese brutality and atrocity is as real today as it was ten years ago. There is still one enemy left in the world—the Japanese—and native and white predict he will return. It may be ten years from now, maybe fifty, they say, but the Japanese will return to conquer the Pacific.

Perhaps this is why signs of hate still hang on the trees. Caverns and tunnels which entombed alive the Japanese defenders remain unopened, and the word Japanese is a dirty one. Laffin's description of the Kokoda Trail, the Caves of Biak, Shaggy Ridge, Honiara, Wau, Rabaul, and his stories of the people of the area today, the planters, patrol officers, missionaries, jungle pilots, and expatriates makes an informative and interesting monograph.

—JAMES F. SUNDERMAN



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Torque Transmitter	CGC-8-A-7	26	.100	.5	11.8	206	8°	—	—	—	—	—	—	37	12	54 + j260	12 + j45	80 + j20	30	7		
Control Transmitter	CTC-8-A-1	—	—	—	—	—	—	11.8	.090	.2	23.5	410	9°	150	24	212 + j684	22 + j115	246 + j60	30	7		
Control Transformer	CTC-8-A-4	—	—	—	—	—	—	11.8	.029	.08	22.5	390	8°	389	64	560 + j1860	90 + j340	640 + j190	30	7		
Torque Receiver	CRC-8-A-1	26	.100	.5	11.8	206	8°	—	—	—	—	—	—	37	12	54 + j260	12 + j45	80 + j20	30	30 sp.		
Electrical Resolver	CSC-8-A-1	26	.038	.42	10.8	190	20°	11.8	.078	.26	23.2	400	11°	230	27	286 + j620	45 + j148	350 + j75	30	7		
Electrical Resolver	CSC-8-A-4	26	.038	.42	26	454	20°	26	.030	.23	21.5	375	12°	230	170	286 + j620	250 + j830	350 + j75	30	7		
Control Differential	CDC-8-A-1	—	—	—	—	—	—	11.8	.085	.21	11.8	206	9°	36	25	38 + j122	27 + j120	48 + j14	30	7		
Vector Resolver	CVC-8-A-1	26	.057	.34	11.8	206	10.2°	—	—	—	—	—	—	78	27	103 + j440	8 + j30		30	7		

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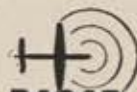
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Editorials

When is a Decision Not a Decision?

Answer: When Propaganda is Allowed to Masquerade as Operational Progress

... the case of Jupiter vs. Thor

SPINELESS bureaucratic indecision, wishy-washy rule by committee, and government by pressure and propaganda—all are exemplified in the controversy over this nation's entry in the Intermediate Range Ballistic Missile sweepstakes. As a result, the so-called "decision" between the Air Force Thor and the Army Jupiter—however that decision goes—will be relatively meaningless and of little lasting significance.

Yet, the issue is a great one. It concerns the means by which this nation will attempt to attain an operational capability in the field of ballistic missiles in the shortest possible time. The reason for concern is spelled out in the news from Moscow. Soviet progress in the ballistic missile field should allow us no choice.

This is no time for interservice feuds. Nor is it a time for hokum. The IRBM is but one of a long series of weapon systems concerning which even more momentous decisions must be made. The intercontinental ballistic missile, ballistic missile defense, submarine defense—all will require objective decisions based upon the facts. If these weapon systems are to be judged in the feverish atmosphere of service partisanship and parochial pressures, the American taxpayer is sure to be the loser.

The fact is that the departing Mr. Wilson, months ago, made a decision on this very question. He chose the Air Force Thor. But in the face of Army-inspired criticism and Jupiter propaganda, he backed off. As pressure mounted, he delayed. And since military security policy did not permit release of *bona fide* information, propaganda was permitted to masquerade as progress, until it became a key element in the action.

When he could delay no longer, and still leave a "clean desk" for his successor, Mr. Wilson resorted to a time-worn device for evading responsibility without compromising authority. He appointed an *ad hoc* committee.

The committee consists of W. M. Holaday, Assistant Secretary of Defense; Maj. Gen. Bernard A. Schriever, Commander, Ballistic Missile Division, Air Research and Development Command; and Maj. Gen. J. B. Medaris,

Commanding General, Army Ballistic Missile Agency. These gentlemen were under heavy pressure from retiring Secretary of Defense Wilson to arrive at a decision before Mr. Wilson leaves Washington in early October.

It is unfair to the members of this committee, each of whom must live with this decision long after Mr. Wilson has left his clean desk behind him, to be pressed for a decision in an atmosphere of haste and political expedience. Nor is it fair to Mr. Wilson's successor, Mr. Neil McElroy, who would be well-advised not to be deceived by the clean desk top. Perhaps a peek in the drawers, in the closet, and even under the rug, might be advisable.

The fact is that a competent and objective group, set up to advise the Secretary of Defense on just such matters, has been bypassed in this instance. It is the Scientific Advisory Committee, originally headed by the late Dr. John von Neumann, and presently chaired by Dr. C. B. Millikan. And if the process of multiple committees is to be followed to its logical conclusion, it would make sense to buttress any decision with the findings of a qualified group of production experts.

Otherwise, it is quite possible that haste in the quest for a decision might well result in dangerous delay in the quest for an operational capability. And regardless of which way the decision might go, there are certain factors in the IRBM case which have not been grasped by the American public.

First of all, one must consider the ultimate goal of any weapon system program. This is to attain, as quickly and as efficiently as the state of the art and the availability of funds permit, a truly operational capability in the full sense of this term. In the case of the IRBM, this means missiles in quantity, fully tested and proved reliable. It means the necessary maintenance facilities and equipment. It means ground handling equipment, launching sites. It means a training program to provide the crews to fire and maintain the missiles, and an administrative and logistic support system. It means a targeting system to include strategic

(Continued on page 35)

IN SUPPORT OF FREEDOM

Four Royal Canadian Air Force squadrons of CF-100s are now in service with NATO in Western Europe. Once again Canada has demonstrated its capability of meeting its commitments to its allies in defence of freedom, on schedule.

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reconnaissance and a practical method of target damage assessment. An additional factor, and a crucial one, is the need to mesh operational ballistic missiles into the manned-bomber operations of the Strategic Air Command, capitalizing on the capabilities of each system and minimizing the limitations of both.

The point is that it is a far cry from test-firing a missile "out of sight" from a launching pad at Cape Canaveral to an operational capability such as that outlined above. An analogy can be drawn which may serve to put the problem into perspective.

Suppose the rifle did not exist, but there was a body of technical knowledge which indicated that one could be built and produced in quantity. One could envisage a situation, in the distant past, whereby the first nation to achieve an operational capability in rifles could dominate its neighbors and thereby significantly tip the balance of power.

One way to approach the problem would be to concentrate one's effort on a hand-made model, carefully put together, with a six-foot barrel, meticulously rifled and balanced, with the powder charge carefully weighed out on jeweler's scales, and so on. Then one could train a marksman so that, firing from a bench rest, with a telescopic sight, on a clear day with no wind, he could put a round in the center of the bull at, say 600 yards, ninety-nine times out of 100.

And, if your goal was solely to hit a bull's eye at 600 yards, this would be a logical approach. But this would not be the problem. The problem would be to arm hundreds of thousands of men with rifles, organize them into trained combat units, mesh them into an existing organization in the shortest possible time.

So, one would go to the experts in the development and manufacture of gun powder (propulsion), metallurgy and woodworking (launcher), machine tooling for rifling (guidance), and so on. A theoretical design would be produced and each component tested. As these proved out, production and assembly lines would be set up, test firings instituted simultaneously with production, and work begun on organizing and training units to be equipped with the new weapon when it should become available.

Obviously the marksman with the hand-made muzzle-loader would look good on the rifle range, in the beginning. You could be getting red flags while he is scoring bulls. But in terms of operational capability on the battlefield, you would beat him by months, or even years.

Crude though the analogy may be, it serves to highlight a much misunderstood portion of the Thor-Jupiter controversy. The hand-made, hand-loaded, hand-fired muzzle-loader is the Army approach to the ballistic missile program, with Cape Canaveral as the modern-day rifle range. It represents the archaic, parochial, government-arsenal approach to weapons development, as exemplified in almost every piece of ordnance the Army currently possesses.

Ask any man who lugged a cumbersome, basically World War I design, automatic rifle through the Pacific jungles or over the Italian mountains during World War II. Or even consider the hash the Army Ordnance Department has made of aircraft armament over the years, in comparison with what the state of the art has permitted. As a matter of fact, the Army has not solved its own rifle problem to this day and it will never do so, so long as it prefers its in-bred arsenal approach instead of picking the best armament brains of the nation and utilizing the production know-how of the greatest industrial system in the world.

In contrast, the Air Force Ballistic Missile Program represents the most ambitious research and development program ever undertaken in this nation, far greater even than

the Manhattan Project which developed the atomic bomb.

The Air Force program draws on and integrates the best available human and material resources from the broad spectrum of science, industry, and government. Thousands of scientists and engineers, in universities, in laboratories, and on existing production lines are contributing their skills and knowledge. Almost every agency of the federal government is participating to some degree. Some 80,000 workers, seventeen major contractors, 200 subcontractors, and twenty-two industries are directly involved.

From the beginning, the Air Force Ballistic Missile Program has been organized into these major elements:

1. Study and analysis of the existing ballistic missile knowledge, particularly the problems to be encountered in guidance, airframe, nose cone, and propulsion.

2. Selecting, through competition, the best qualified contractors on the basis of both technical and management competence.

3. Assigning these contractors the development of large, liquid-rocket engines, guidance systems, nose cones, high-thrust propulsion, computers, etc.

4. Testing of computers and subsystems for reliability and producibility.

5. Flight testing, to include the launcher, the missile, ground support equipment, and all elements of a completely operational missile system.

6. Operational programming, including factory-training of launching crews, and setting up administrative and logistic support organizations.

Each phase is timed and coordinated with the other so as to progress simultaneously according to established schedules. Only thus can the pressures of time and cost possibly be overcome and operational lead time be trimmed in an effort to bring us abreast of and pass, if possible, the Soviets in this critical field.

Against this, how does the Army program stack up?

First, the Army depends for its study, analysis, and store of technical know-how almost entirely upon the group of German scientists under Werner von Braun. This same group has been responsible for the building of hand-made models at Redstone Arsenal and for the firing of these models at the Air Force Missile Test Center. For further progress, the Army must inevitably depend on the broader science-industry-government base which the Air Force is already drawing upon.

To do so, however, would go against the Army grain. For Army spokesmen flatly, cheerfully assert that "only a completely integrated group, working in one place," can develop a successful ballistic missile and that this can be done only "in government installations."

This is part of the Army propaganda concerning "successful" test flights.

The Army has loudly trumpeted claims that the Jupiter's "successful" test flights automatically make it a better bet to achieve an operational capability ahead of the Air Force Thor, as if the object were solely to fire a missile "out of sight." If, on the other hand, the achievement of a true operational capability is the goal, the leaks about the Army successes at Cape Canaveral are shown for what they actually are—a mish-mash of half-truths, outright fabrications, and deliberately misleading implications. (As expected, these leaks are plugged up as problems occur, as in the case of the recent Jupiter launching when the bird went straight up and came straight down in what was hardly a "successful" test flight.)

In the first place, no distinction has been made as to what can truly be called "Jupiter." Several Army firings, ostensibly termed Jupiter, were not really Jupiter at all

(Continued on following page)

but a souped-up version of the Redstone 200-mile missile which, in turn, is only a refined V-2. Every Thor tested has been a Thor, a true prototype, including the Thor that was fired recently in an eminently successful flight test.

All Jupiters have been hand-made models, with airframes that are certain to bear little or no resemblance to production models.

There have been vaunted claims of Jupiter's accuracy. In fact, newsmen have been led to believe that the Jupiter guidance system has unerringly directed the missile to its target. However, there has been no indication, as of this writing, that the guidance system of either Jupiter or Thor has undergone a missile flight test. A civilian highly respected in the guidance field was recently asked to explain how Jupiter reportedly came so close to its target some months ago. He laughed and said:

"That's easy. They picked the target after they found out where the missile landed. Where it lit, it hit. That's how simple it was."

Furthermore, little profitable data has been obtained from the Army's test firings, because they have been pointed primarily to firing "out of sight," instead of being geared to instrumented testing from which useful findings could be obtained. On the other hand, the Thor program is deliberately designed to provide data as a basis for progression regardless of which missile gets the nod.

Test firing becomes, then, only one part of one phase of the problem. The only realistic assessment can be made from an examination of all phases including (1) the technical status of the program; (2) the production problems solved in obtaining missiles in operational quantities, and (3) the operational problems to be solved before true combat readiness can be attained.

Measured against all of these factors, let us look at the possible consequences should the decision be in favor of Thor, in favor of Jupiter, or in favor of a hybrid version.

1. Should Thor be selected there would be no interruption in a program already under way and on schedule. The airframe, the guidance system, the engine, and the nose cone—all major subsystems are ready for production in operational quantities, as soon as tests have been completed.

2. Support equipment, in-plant test equipment, launching site instrumentation, are ready for phasing into the production scheme.

3. Major subsystems, and support and test equipment,

have already been subjected to exhaustive tests, beginning with laboratory bench tests of components and assemblies up to, and including, flight. Reliability is checked under conditions even more exacting than those encountered in flight. There have been many captive tests of propulsion and other systems, as well as of the complete missile.

Thor flight tests have shown that the propulsion system has produced the desired thrust and acceleration; that pre-flight preparation and launching procedures are satisfactory; and that the missile structure itself is sound.

4. A training program designed to provide skilled technicians in all required categories is in motion.

5. The Thor itself is, in all cases including flight, being tested in its operational configuration.

In short, production of the Thor in operational quantities can be started with a minimum of delay.

What if Jupiter gets the nod?

1. There should be no problem with propulsion. Both missiles use the same system, researched and developed by the Air Force with Air Force funds and manufactured by North American in Air Force-owned facilities.

2. The Jupiter airframe would require considerable modification and production engineering before it would be suitable for quantity manufacture. In fact, even Army experts agree that a production configuration would closely resemble that which Douglas now is turning out for the Thor program.

3. The Jupiter guidance system, to the best of our knowledge, has not been subjected to the gruelling sled tests, shock, vibration, and environmental testing which the Thor guidance system has already passed. Like its airframe, the Jupiter guidance system would have to be considerably modified for production, whereas the Thor guidance system is already being produced at AC Sparkplug's Milwaukee plant.

4. The problems of quantity production of the Jupiter outlined above likewise apply to such considerations as in-plant test equipment, ground support equipment, training, and administrative and logistic support.

If Jupiter is selected, estimates of the delay in the IRBM program, due to the factors outlined above, range from an optimistic eighteen months to a pessimistic three years.

It is quite possible that the same motives which led Mr. Wilson to seek the *ad hoc* committee as a way out of his dilemma may lead to an announced "merger" of the two missiles, regardless of what his committee may recommend. Such an announcement may serve as soothing syrup to quiet ruffled feelings, but from a technical point of view a true merger is a virtual impossibility.

What it all boils down to, apparently, is that, regardless of how the announced decision may be phrased, the nation's Intermediate Range Ballistic Missile will be the Thor, or something closely resembling it, at least by the time it reaches operational units in operational quantities.

This is why we said in the beginning that the decision in this particular instance would be relatively meaningless. But the fact that we must arrive at the inevitable through such tortuous channels does not augur well for the future.

This way of doing business, if applied to forthcoming weapon systems decisions, could lose us the race for survival.

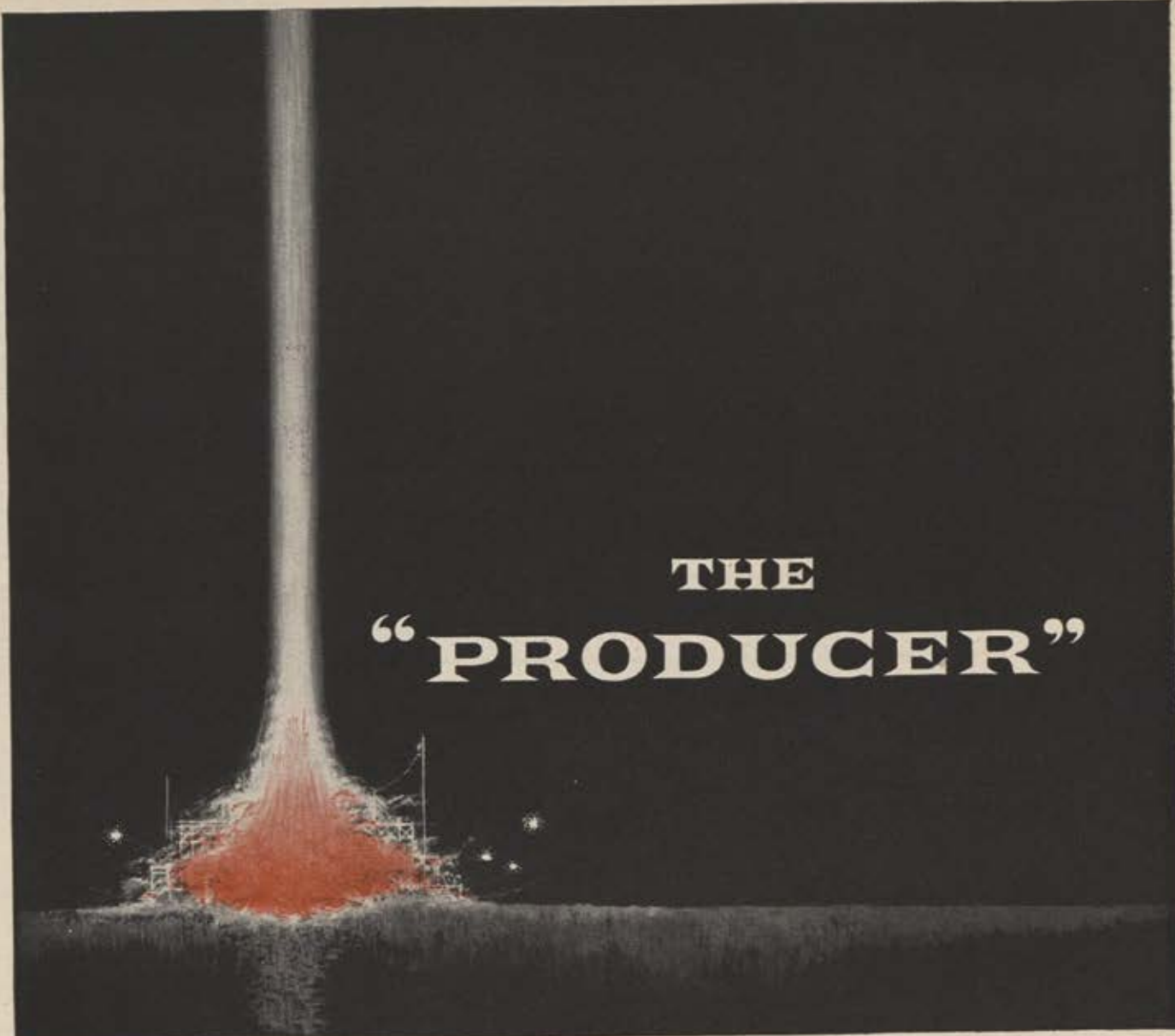
For this nation to survive in an age of ballistic missiles and megaton warheads will demand firm decisions and rapid action on the part of civilian shapers of our military policy as well as on the part of the military leaders charged with carrying out this policy.

Lack of these qualities in selecting our weapons today may deprive future leaders of the opportunity either to decide or to act.—END

RAISE IN DUES

Beginning January 1, the annual dues for active, service and associate members of the Air Force Association will be \$6.00 instead of \$5.00 as at present. The raise was voted by delegates to AFA's convention in Washington in August as a partial answer to constantly rising costs. Squadrons will benefit thereby, since each squadron will receive a refund of \$2.50 for each new member and renewal member who forwards his dues through a squadron. The squadron refund has been \$1.50. In addition, wing organizations will receive a refund of \$.50 for each member in their respective states, whether or not he belongs to a squadron.

Subscription rate likewise will go up on January 1, from \$4.00 to \$5.00. The cadet rate of \$3.00, for AF ROTC cadets and CAP cadets, was unchanged.—END



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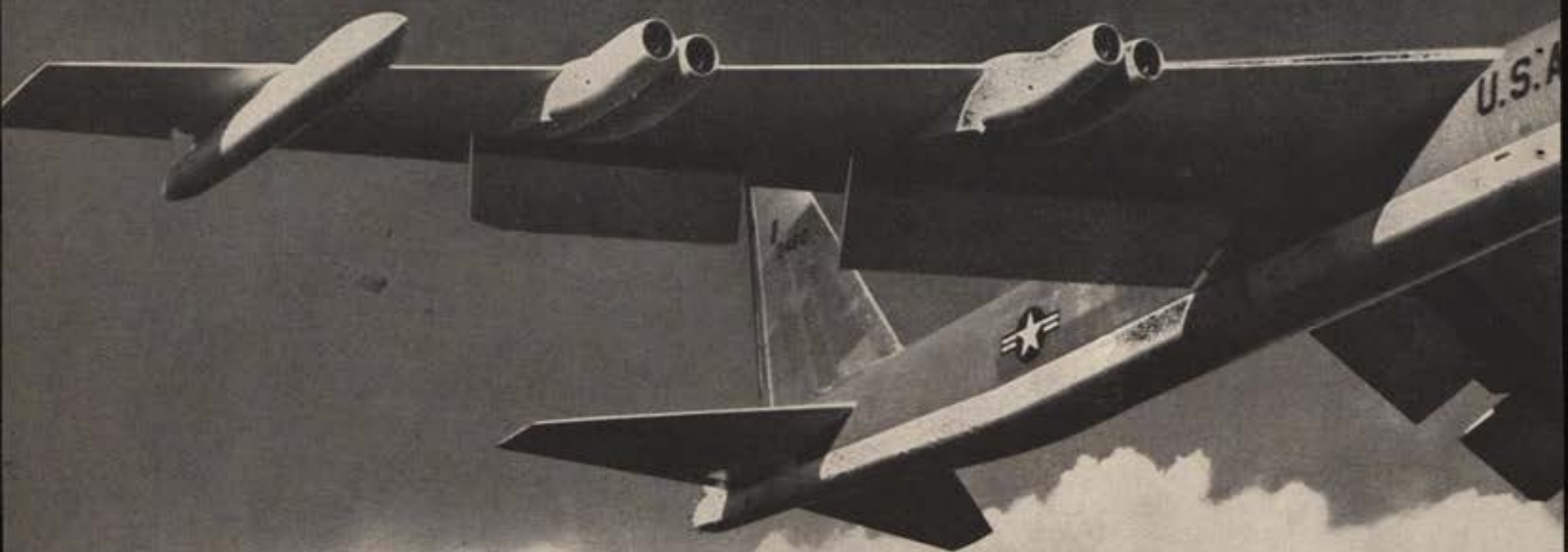
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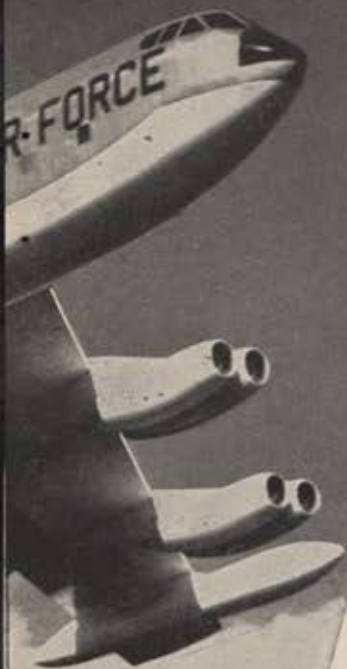
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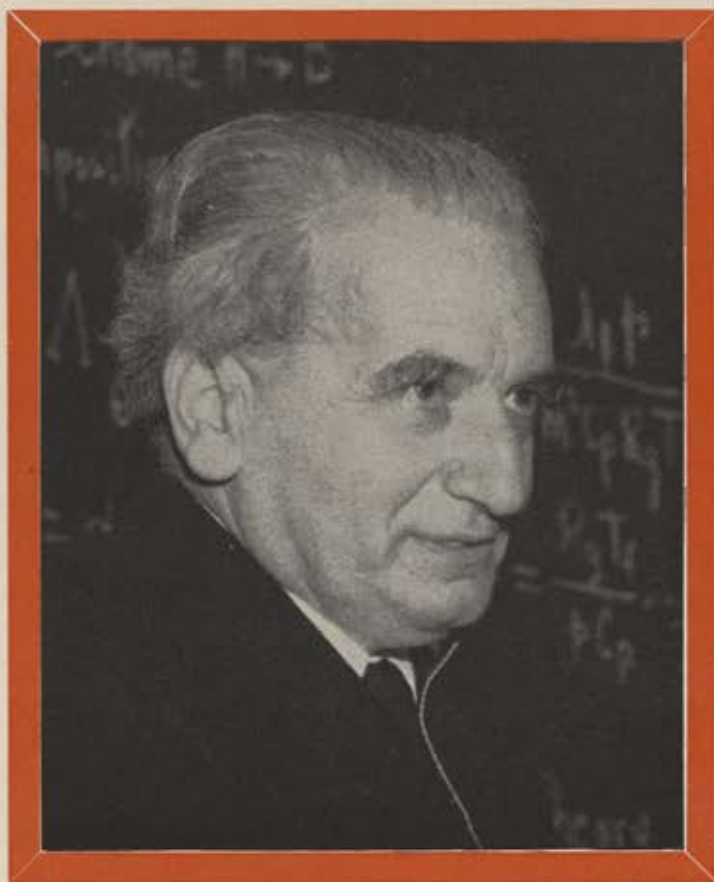


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Dr. Theodore von Kármán

Gemütlicher genius of aeronautics

By Robert Cahn

ON THE occasion of his seventy-fifth birthday last year, Dr. Theodore von Kármán received a note of greeting which read: "... You are to us and to a great many others, 'Mr. Aviation.'" It bore the signatures of Jacqueline Cochran and Floyd Odlum. Another letter said, "The Air Force will be forever grateful and shall always remember your outstanding service to its development and growth." It came from Lt. Gen. Donald L. Putt, in charge of Air Force research and development.

Still another letter, from a former

student at California Institute of Technology, said simply, "In the history of science the reputation of a man depends upon his recorded achievements. Yet the man is more important than the science he serves, and it is thus we regard Theodore von Kármán."

These letters, and hundreds more from scientists, industrialists, military men, and former students throughout the world (even from Communist China) were paying a unique kind of tribute. It was not—as might be expected for a man who had been a leading scientist for more than fifty

years—a swan song. Rather, it was a somewhat belated recognition at the peak of a career to a Hungarian-born scientist whose achievements are so many and varied that they almost defy accounting.

Von Kármán started the first jet propulsion laboratory in the United States, formed the first American company to manufacture rocket engines, and organized the Scientific Advisory Board to advise the Air Force on long-range planning. His many years of patient research in aerodynamics

(Continued on following page)

played a large part in breaking through the so-called sound barrier. Today, because of von Kármán-directed studies and von Kármán planning, our rockets and guided missiles go farther and faster and have greater accuracy. And some of the world's longest bridges resist buckling because of a von Kármán formula discovered forty years ago.

These, however, are only outward contributions. Like an iceberg, the greatest part of von Kármán's life work lies beneath the surface and probably will never be adequately measured. This is his influence on the lives of his colleagues, his students, and, in turn, their students, who permeate the world of aviation science and industry. Theodore von Kármán is a catalyst among men: prodding, inspiring, counseling, interpreting, and through it all, uniting the often-divergent paths of science, industry, and the military.

He is many things to many people. To the thousands of former college students at Caltech (where he actively taught aerodynamics for eighteen years) and at universities in Aachen, Tokyo, Cambridge, Paris, and Brussels, von Kármán is the revered teacher who is still consulted on problems. To hundreds of scientists and military planners in thirteen NATO countries, where since the age of seventy he has headed AGARD (Advisory Group for Aeronautical Research and Development, see "NATO Brain Bank," by Dr. von Kármán, *AIR FORCE*, May '54), von Kármán is a multilingual peacemaker and coordinator who somehow has the faculty for making even the French and Germans forget for a time their long-nurtured animosities.

To giants of American industry and to US military chiefs, he is adviser, sometimes father-confessor, and frequently close friend. And to those who most regularly drop in to sit around the dining room table at Sunday afternoon open house whenever he is home in Pasadena, he is just "Todor," the *gemütlicher* host who calmly rubs the neck of his large, shaggy poodle "Koko," when not needing both hands to tell a funny story or to explain some obscure theory.

For a man seventy-six years old, there is little evidence of any slackening of activity. It is true that his short, stocky frame shows somewhat the evidence of age. He walks with a slow shuffle, the once black hair and bushy brows have grayed, the kind, generous face is well lined, and the figure is no longer trim. Yet behind the heavy-



At his favorite stand—teaching, an opportunity, which by his own account, von Kármán gets all too rarely. He's pictured at 1953 lecture at Princeton.

lidded blue-green eyes which sometimes give the impression that the owner is far away, the mind of Theodore von Kármán is as quick and brilliant as ever, although the words emerge more slowly, tempered and mellowed with an ever growing patience for the mistakes or shortcomings of others.

After surviving a series of birthday banquets in Paris, New York, and Los Angeles, last year, von Kármán went right back to his regular activities. He summered and wintered in Pasadena, except for consulting and advising trips to San Diego, Washington, Fort Worth, and New York. While in Pasadena, he found time to spend two days a week at the Aerojet-General Corporation in Azusa, where he is chief consultant; give help to researchers, teachers, and students at Caltech, where he is Professor Emeritus of aerodynamics; prepare scientific papers and lectures; and do consulting for numerous Southern California aircraft, jet propulsion, and missile plants. In the spring he left for Europe, where he organized and conducted scientific conferences in Paris and the Hague and traveled throughout ten countries on AGARD business.

"Whenever you ask where is von Kármán," says one colleague, "You never find out where he is, but always where he is from to."

Dr. von Kármán's only regret at his busy schedule these days is that he cannot find enough time for active teaching. "I always wanted to be

professor," he says. Somehow, the Caltech grapevine magically passes down the word as soon as he returns to Pasadena, and his home becomes a mecca for graduates and undergraduates who have some theory or problem in physics, aerodynamics, or engineering to discuss. It does not matter that they have never even met the great scientist—it is enough that the student is able to reach a point where he can ask questions and pose problems.

"Von Kármán talks with any one of us as though we were von Kármán, and he, von Kármán, the one learning from the master," says Simon Ramo, a former Caltech student and now co-head of the Ramo-Wooldridge Corporation, directors of the nation's ballistic missiles program.

A few weeks ago, when he should have been summering in Pasadena and taking things a bit easy, von Kármán found himself involved in yet another project. The Air Force, under the sponsorship of the National Academy of Sciences, had asked him to gather some of the nation's leading scientists for a full assessment of the present state of airpower and to make recommendations as to what might be needed in the next ten to twenty years.

Late in June, von Kármán and 150 scientists and Air Force planners met at Woods Hole, Mass., to open a supersecret project, officially labeled "Technical Long Range Planning for the United States Air Force." If the



His old friend and World War II colleague, Gen. H. H. Arnold, awarded him a meritorious service emblem in 1945 for his numberless contributions to victory.

results are only half as good as a similar von Kármán-led project thirteen years ago, it will be considered highly successful.

In 1944, while the fighting in Europe and the Pacific was still going strong, von Kármán received a call from Gen. H. H. "Hap" Arnold asking the scientist to meet him at the New York airport early the next morning, as he was en route to Quebec. Von Kármán explained that he was in a health resort fifty miles from New York recovering from an operation, but Arnold insisted the matter was of vital importance. Before dawn the next day, an Army staff car whisked von Kármán away to La Guardia Airport for a rendezvous with General Arnold at the end of the runway.

"I want you to forget about the present war," Arnold told him. "Get together the best scientific brains in the country and tell us what airpower can do to prevent World War III."

"I will do it on one condition," replied von Kármán. "That I have to take orders from no one and give orders to no one."

During the next twelve months, von Kármán and thirty-one leading scientists, working together in the newly organized Scientific Advisory Group, investigated all phases of the problem. Their survey included trips overseas to study, in the wake of Allied advances, the progress of German and Japanese scientists and a tour of all USAF research and development centers. The von Kármán report, entitled *Toward New Horizons*,

which was issued late in 1945, has been a bible for Air Force planning during the past decade. Included in the report, with assessments of the scientific possibilities, were such things as an earth satellite, smaller size nuclear bombs using nuclear reactions other than fission, automatic celestial navigation, supersonic bombers and interceptors, intercontinental missiles and rockets, ejection cockpits with automatic opening devices for high-speed, high-altitude bailouts, antimissile defenses such as a rocket barrage with atomic warheads, and the application of jet propulsion to rotary-wing aircraft.

The survey, however, did not stop with recommendations for "things." It stressed especially the need for an independent and orderly Air Force research and development program and methods for the introduction of scientific ideas into a military system. It was suggested that there be a permanent air staff section for research and development; that the position and rank of officers responsible for research and development be made commensurate with the importance of their work and not dependent on the size of the organization under their command; that additional scientific training be given to officers; that adequate research centers be developed; that there be direct research contracts between the Air Force and scientific institutes; and that libraries of classified material be made available to cleared scientists.

"Unfortunately, it is not possible to

establish the necessary link between science and industry on the one side and the Air Force on the other, by establishing contact and agreement at the top level only," stated von Kármán in his summary report entitled *Science, the Key to Air Supremacy*. "Scientific results cannot be used efficiently by soldiers who have no understanding of them, and scientists cannot produce results useful for warfare without an understanding of the operations," he added.

Von Kármán also outlined the need for basic scientific research free from immediate specific goals and time-tables. "Wars are fought with weapons based on fundamentals discovered during the preceding years of peace," wrote von Kármán. "Government authorities, military or civilian, should foster, but not dictate, basic research. If free enterprise and initiative are necessary for maintaining a sound economy within a nation, certainly they are even more necessary in scientific life."

Von Kármán has at times been compared in brilliance with another European-born immigrant, the late Albert Einstein. Yet there probably never were two more dissimilar personalities than these two long-time friends. Where Einstein was completely a theoretical scientist, von Kármán works equally well in theory, engineering, industrial development, and military planning. Where Einstein occasionally entered the political arena, von Kármán has scrupulously kept to himself his personal opinions on politics and international relations. (Continued on following page)



Geniuses both, although dissimilar in many ways, von Kármán and the late Prof. Albert Einstein were good friends.



To colleagues and friends the world over, his trademark is a jaunty beret.

tions. But the chief difference between the two men was in their relationship with the world. Einstein was basically a shy man who lived virtually as a recluse. Von Kármán, while not actually gregarious, still manages to enjoy life to the hilt.

As he shuffles along throughout the world these days, his ever present beret set jauntily atop his bushy hair, von Kármán is one genius who actually looks and acts up to expectations. His Paris suite or his Pasadena home frequently resemble Grand Hotel, with scientists, students, generals, and occasional blondes dropping by for tea or cocktails, and always being warmly greeted, no matter how many are already on hand. His desk is usually piled high with papers in utter confusion. He is at times the absent-minded professor, forgetting appointments or looking for his black-rimmed glasses which are perched on his forehead.

Von Kármán has for years worn a hearing aid, and is occasionally suspected of pretending not to hear when it suits his convenience. His conversational English is heavily laden with Hungarian accent and European phrasing, although his written papers are models of clarity. Until his doctors put a stop to it a few years ago, he smoked powerful cigars one after another and drank large amounts of slivovitz (plum brandy) and other



During visit to Turkey in 1955, von Kármán had fun using one of the world's oldest telephones in the saloon of the Grand Vizier of the old Ottoman Empire in Istanbul. At left, Prof. Fahrettin K. Gökay, his host and Governor of Istanbul.

alcoholic beverages without apparent effect. He still engages in social exchanges of slivovitz, but has stopped smoking entirely. Although a bachelor, his eye for feminine charms, even at seventy-six, is undimmed. He will seek out the prettiest woman in a crowded room like a bear heading for honey, and no conversation is too important not to be interrupted by his fascination for a passing ankle.

Recently in London, von Kármán was invited to the home of one of England's leading aerodynamicists for

a conference preceded by a dinner to which the scientists' wives were also invited. After dinner, the wives retired to the drawing room to let the men have their conference. But to everyone's amazement, von Kármán went right along with the women. For half an hour the Englishmen waited for their honored guest to return and finally had to send a delegation to bring him back.

"Von Kármán has two great abilities," says an associate. "One is to leave those men with whom he has talked for a while with the certainty that they, too, are intelligent. The other is to leave those women with whom he has talked for a little longer, with the certainty that they are the most intelligent and attractive of women."

Among his students and colleagues, the rehashing of von Kármán anecdotes is a favorite pastime and most of the stories concern his rare sense of humor. Introduced to the famed British aviatrix, Amy Johnson, von Kármán found himself being asked to explain the theory of a tailspin. "A

tailspin is like falling in love," he told her. "You hardly notice how you get into it and to get out of it is very difficult."

Another story concerns a job done for a California industrial concern at a wind tunnel directed by von Kármán. In the course of working on the problem, some revolutionary discoveries worth thousands of dollars were made, although a specific answer to the industrialist's problem was not immediately forthcoming. The president of the company quibbled about

paying for the project because he had not gotten exactly what he had desired.

"By your reasoning," said von Kármán, "Columbus would have been a failure. You see, he did not discover a short route to India—which was what he had been hired to do."

The employer thought for a while, finally conceded the point and paid the bill.

"I was lucky he did not know better his history," von Kármán later told friends. "He could have said Columbus ended up in jail for not satisfying his employers."

Another time von Kármán got in a three-year hassle with military finance officers over payment for consulting fee. At General Arnold's request in 1941, he was hired to direct the building of a wind tunnel at a consultant's fee of \$50 a day. By the time von Kármán submitted a bill six months later, a law had been passed by Congress forbidding paying consultants more than \$25 a day. Von Kármán said, "Okay, make it \$25," but the finance officer replied that this

this is the time nor the Air Force the place." He was paid immediately.

Once at Wright Field a group of scientists and pilots were discussing the consequences of automation. "Automation can do many things, but you still need a human being in the cockpit," insisted a veteran test pilot. "For instance," he added, "where can you get a servomechanism that can react instantly, make decisions based on judgment, yet weigh only 150 pounds?"

Commented von Kármán. "Yet you must remember that there is a lead-time of twenty years or so before the servomechanism of which you speak can become operational. However," he added, suppressing a smile, "there are things in its favor. It can be created with unskilled labor."

Von Kármán frequently tells stories on himself. Once, after a five-hour delay before taking off at Dallas, he filled out a form letter which asked if he was satisfied with the trip. Von Kármán complained about the delay and suggested that the airline furnish rebates on fares if unable to meet

During a visit in China a number of years ago, he was asked by Madame Chiang Kai-shek, who was at that time deeply concerned with building up China's air force, to explain how a wind tunnel operates. "I talked for an hour," says von Kármán. "But when I finished she replied, 'I did not understand a word you said, but from the way you talked it must be very important, so China must have a wind tunnel.'"

Von Kármán also likes to recall his first newspaper interview on coming to America in 1926. "I told the young man I was coming to the United States to visit laboratories," recalls von Kármán. "But I happened to look down at his notes and saw he had written 'is visiting lavatories.' So I explained that although this, too, was sometimes necessary, it was not the purpose of my trip. I did not speak so well then—I do not speak so good now, but it is better, yes?" he adds.

While von Kármán may have difficulty sometimes with his enunciation, there is a deep respect throughout the scientific world for his ability to bring together men of different fields or diverse views. A famous mathematician tells of a conference at Langley Field a few years back where the morning session was devoted to highly complicated papers on special subjects which seemed understandable only to the authors. During the lunch hour, von Kármán talked with each of the specialists privately, then returned to the conference to explain what each man had really said.

Von Kármán's ability as a communicator has had its severest test the past five years working with representatives of the thirteen NATO nations in AGARD. While NATO was in its formative stage von Kármán urged that there be some provision to coordinate research and development in aeronautical sciences and to apply the findings to mutual defense problems. Although von Kármán did not particularly desire the job of chairman of AGARD when it was set up in 1952, no one else was even considered, and it is extremely doubtful if there is any other man in the world who could have made it work.

Von Kármán is aided in his AGARD work in that many of the scientists he is dealing with are former colleagues, students, or friends. He often will hold a conference in a sidewalk cafe on the Left Bank of the Seine where he will converse, if necessary, in assorted languages. ("Actually," von Kármán says, "I speak good Hun-")

(Continued on following page)



His AGARD activities keep the indefatigable von Kármán traveling to provide counsel to Free World defense planners. Shown at a meeting of the group, the Netherlands' Prince Bernhard, von Kármán, and colleague Dr. F. L. Wattendorf.

was impossible because the contract was for \$50 a day. Back and forth went the memoranda on various minor points and expense items. Finally in 1944, an officer at Wright Field wanted a certificate to show that something actually had been accomplished—because it was inconceivable that the great von Kármán would work for only \$25 a day. That was the last straw. On the stationery of the General of the Air Force, von Kármán replied, "I, too, am an admirer of Gilbert and Sullivan, but I do not think

scheduled arrivals, similar to a plan then being used by a western railroad. A few days after returning to Pasadena, he received a letter apologizing for the inconvenience, but not agreeing with his suggestion about rebates. Although the letter bore the signature of C. R. Smith, president of American Airlines and an acquaintance of von Kármán, it obviously had been written and signed by some underling, for it ended with the statement . . . "Obviously, Mr. von Kármán, you do not understand the basics of aviation."



Von Kármán studied under pioneer aerodynamicist Dr. Ludwig Prandtl, saw him again in Germany at war's end.

garian, fair German, bad English, French and Italian, some Spanish, and very little Yiddish. But," he adds, "I can tell good Jewish jokes.")

In addition to AGARD research and development programs in flight-testing, combustion, wind tunnels, aeromedicine, guided missiles, and documentation standardization, von Kármán has started a project to produce the first NATO airplane, a lightweight tactical strike fighter. The committee in charge of development of the new plane was formed by Col. John Driscoll of the USAF. Prototypes of one Italian and two French configurations are now being built, all with English engines.

As can be imagined, the problems of getting representatives of several countries to agree on a plane that all will use has been no easy problem. But differences have been settled or compromised, even the complaints of a six-foot-tall British officer concerning the size of the cockpit designed by a small Italian (the cockpit was enlarged). Von Kármán hopes to have the fighter operational in 1958.

Probably the greatest victory for von Kármán diplomacy, however, occurred last fall during an international scientific conference at Brussels which was attended by scientists from both sides of the Iron Curtain. During the opening session, four of von Kármán's former Caltech students who had returned to Communist China invited their former teacher to dinner. Von Kármán accepted but asked them to come to his hotel room first for cocktails. Later in the day, five Chinese who were former Caltech students but were now teaching in the United States or in Formosa asked von Kármán to dinner. Without batting an eye, he accepted, and asked them, too, to his room for cocktails at the same hour he had invited the Com-

munists. The Communists arrived first and were already having aperitifs when the other group arrived. All nine, together with von Kármán and a lady friend, went to dinner at a Chinese restaurant. The following day, the nine former students posed with von Kármán for a picture. One thing still perplexes von Kármán about the incident, however. "I do not know who picked up the check," he says.

Born in Budapest, May 11, 1881, the son of a noted philosopher, von Kármán received a mechanical engineering degree at the Royal Technical Institute in Budapest in 1902 and studied in Europe under such famed scientists as Madame Curie, Felix Klein, and Ludwig Prandtl. Von Kármán had his aviation baptism in 1907, and the year 1957 is for him as well as for military aviation a golden anniversary.

Characteristically, it was a young lady, a Hungarian newspaper woman working in Paris, who served to introduce him to the world of aviation by cajoling him into taking her out to the Issy-les-Moulineaux airdrome at five a.m. to witness the first scheduled sustained powered flight in France. Convinced beforehand that nothing was important enough to make getting up at that hour worthwhile, young von Kármán became fascinated, however, when the plane flew for more than a mile. He spent four hours talking with the pilot and other flying enthusiasts.

Until then, von Kármán had been doing graduate studies and working

as a research engineer for a Budapest machinery manufacturer. Now he wanted to investigate the forces that made the airplane fly, and soon started study at the University of Göttingen where aeronautical research was going on for semirigid dirigibles.

By 1912, von Kármán had been appointed director of Germany's newly established Aeronautical Institute of the University of Aachen and was swapping ground instruction to young pilots in return for flying lessons. On his first flight, after cruising at seventy miles per hour at 3,000 feet, the old singlewing plane crashlanded in a potato patch. "We were not injured," says von Kármán, "although the police came and fined us \$5 for trespassing in the farmer's field."

While at Aachen his ever-inquisitive nature led to the most famous of his scientific discoveries. By chance one day, von Kármán observed a young student who was stumped when he could not satisfactorily explain reasons for eddies or vortices created by water moving past a cylinder in a channel. Von Kármán spent the weekend thinking over the problem, and figured out certain mathematical formulae, which over the years since have become known as the Kármán Theory of Vortex Streets (in France, "Avenue de Kármán," in Germany, "Kármán Strasse"). The theoretical von Kármán explanations of turbulences are now pillars upon which modern aerodynamics is based. For many years, the application of the Kármán Vortex theory has been fundamental to predicting drag and



An historic moment for flight—the first jet-assisted takeoff in 1941. Checking plans at March Field, Calif., from left: Dr. C. B. Millikan, Dr. Martin Summerfield, von Kármán, Dr. J. F. Maline, Capt. H. A. Boushey, Jr.



First full meeting of the Scientific Advisory Board, in June 1946, at the Pentagon. Seated, from left: Dr. George E. Valley, Jr., Dr. Frank L. Wattendorf, Dr. George A. Morton, Dr. Nathan M. Newmark, Dr. Walter S. Hunter, Dr. Lee A. DuBridge, Dr. Detlev Bronk, Dr. Theodore von Kármán, Dr. Charles W. Bray, Dr. C. Richard Soderberg, Dr. Courtland D. Perkins, Dr. Charles S. Draper, Dr. Harold T. Friis, Dr. William R. Sears. Standing, from left: Dr. Pol E. Duwez, Dr. Hsue-shen Tsien, Dr. William H. Pickering, Dr. Ivan A. Gettings, Dr. W. J. Sweeney, Dr. W. Randolph Lovelace, II, Dr. Julius A. Stratton, Dr. Duncan P. MacDougall, Dr. Edward M. Purcell, Dr. Vladimir K. Zworykin, Dr. Fritz Zwicky, Dr. Robert H. Kent, Col. William S. Stone, and Col. Roscoe C. Wilson. The SAB members not present at this meeting were Prof. Enrico Fermi, Dr. George Gamow, Dr. Hugh L. Dryden, Dr. Walter A. MacNair, and Col. Benjamin C. Holzman.

has aided in the design of transonic and subsonic aircraft. Von Kármán became the world's leading authority on wind tunnels, and has advised on, or supervised construction of the most important wind tunnels in Europe, America, and Japan.

Before coming to the United States, von Kármán also pioneered in helicopter work in Europe, and during World War I headed a research department in the Austro-Hungarian Aviation Corps. He first visited America in 1926 under the sponsorship of the Guggenheim Fund for the Promotion of Aeronautics, to advise on wind tunnel facilities and to inspect Guggenheim laboratories.

On this trip, he had his only meeting with Orville Wright, who took great pride in showing von Kármán the wind tunnel in which he and Wilbur had logged 200 hours of model tests before attempting their historic flight. In 1928 von Kármán joined the Caltech faculty, although still dividing his time with the University of Aachen. But in 1930 he became director of Caltech's Guggenheim Aerodynamics Laboratory and settled down

permanently in Pasadena. Six years later he became an American citizen.

In the late 1930s von Kármán and some of his students started working with jet propulsion and rockets. ("We were called the Suicide Club because sometimes there were some unexpected explosions," says von Kármán.) In 1938 General Arnold asked the National Academy of Sciences to get a committee together to discuss current Air Force problems such as deicing aircraft windshields and assisting bomber takeoffs with booster rockets. A representative of Massachusetts Institute of Technology volunteered to tackle the deicing problem, adding, "Let von Kármán do the Buck Rogers stuff." Von Kármán accepted, and when the war broke out in 1941, was well on the way to completing a JATO (jet-assisted takeoff) unit. In 1942, he became founder and director of the Army Jet Propulsion Laboratory at Caltech, the first laboratory of its kind in the nation.

The previous year, von Kármán had tried unsuccessfully to persuade a number of American corporations to go into the rocket manufacturing

phases of work being carried on at Caltech. When no one was interested, von Kármán, four other Caltech faculty men, and a lawyer friend, Andrew Haley, each put up \$1,250 to form the Aerojet Engineering Corporation at Azusa, Calif. Von Kármán was the first president of the company, but turned over the reins to Haley so that he would have more time to develop rockets for the Air Force and Navy. By 1944, JATO units were being used by Navy PBYS in saving the lives of downed airmen in the Pacific, and shortly thereafter the Air Force had the units to help heavy bombers in short-strip takeoffs. Today, Aerojet-General (it was taken over by General Tire and Rubber Company in 1944) has 10,000 employees in three huge California plants and among other things is building engines for intercontinental and intermediate-range ballistic missiles, and for the Vanguard earth satellite project.

In 1944, von Kármán became the first chairman of the Air Force Scientific Advisory Group (later called

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the Scientific Advisory Board), and is still an active member of the board. He also has served as an adviser to the Navy, and to Army Ordnance.

The fact that von Kármán has never married is puzzling to many of his friends. Some attribute it to disillusionment in an early romance, while others hold to the theory that von Kármán applies his standards of diversification of interest to women as well as to science. Also, for many years his home was presided over by his sister, Josephine (Pipő), a handsome woman who held a Ph.D. from UCLA. When she passed away in 1951, the shock was almost fatal to von Kármán, but he buried his sorrows in the increased workload of starting AGARD. Von Kármán recently has set up a scholarship in his sister's name to provide for education and training of Europeans in America.

Von Kármán today has accumulated seventeen honorary degrees, is a member of twenty-six scientific societies throughout the world, and has received medals of honor from five countries and also the Air Force Association's Science Award, the Wright Brothers Award, the Franklin Medal, and the Lord Kelvin Award.

Over the years, von Kármán has engaged in countless projects, dividing his time among teaching, basic research, and consulting. Scientists and engineers throughout the world rely on his tangent modulus theory on buckling of columns, the Kármán theory of drag in supersonic flight, the Kármán-Tsien theory on compressible flow, and the Kármán-Born theory on specific heats of solids. Von Kármán was called in as a consultant to help investigate the crashes of the dirigibles *Akron* and *Macon*; he was employed to determine why the Tacoma Narrows Bridge broke up (and his suggestions have helped prevent

future disasters at other bridges); he was asked to help with design of the pumps for Grand Coulee Dam; and he computed the shape and thickness of the Mount Palomar Observatory's 200-inch mirror so it would not buckle. Once, to satisfy his own curiosity on the effect of wind movements on sand ripples, he spent several weeks in a tent in the Sahara desert.

It has been curiosity like this which has kept him in the forefront, and often far ahead, of the aviation industry throughout its entire history.

"I have found you should always question everything," says von Kármán. "We should not be inclined to accept that things cannot be done, but should investigate *how* they can be done," he adds.

Von Kármán today is sometimes cast in the role of elder statesman of aeronautics, a position he dislikes because it infers he is no longer a working scientist, and also because he is expected to make earthshaking pronouncements.

When asked if he thinks there will be a standoff in the missile race between Russia and the US he replies: "This is a political, not a technical question. You are asking what will a nation do. It is like the old Jewish story. A rabbi approached the house of a man who had a dog that barked viciously at him. The rabbi drew away, but the owner said, 'You don't have to be afraid of him. Don't you know that dogs that bark don't bite?' 'Yes, I know it,' replied the rabbi. 'But does the dog know it?'"

Or when asked about how fast commercial aircraft might go in the future, von Kármán points out that we have not yet solved the problems arising from the present speeds—congestion, distance of airports from cities, noise, baggage loading, customs, etc. "It has no sense to go with the flying speed higher until the air-



A rare moment of relaxation. Von Kármán, between trips, at his desk at his pleasant home in Pasadena, Calif.

craft has been civilized for human environment," he says.

Two letters received on his seventy-fifth birthday serve well to sum up the feeling of his worldwide friends toward von Kármán:

Wrote Adm. Arleigh Burke, Chief of Naval Operations, "The many naval officer students are grateful for the guidance and inspiration you have given them. They are proud to have been your students and the Navy is proud of them. Through them your influence on technology will continue to expand far into the future."

Scientist Frank Malina's letter ended with a benediction: "May you long continue to circle the sun so that those of us who have studied and struggled at your elbow may continue to be warmed by your own radiation." —END



ABOUT THE AUTHOR

Author Robert Cahn, who started his writing career as a reporter and sportswriter for the *Seattle Star* in his native Washington, was a senior editor of the old *Collier's* magazine, and from 1955 till its demise was head of the *Crowell-Collier* bureau in Los Angeles, from which spot he covered Southern California's aircraft and missile industries, movies, and television for *Collier's*, the *American Magazine*, and the *Woman's Home Companion*. A graduate of the University of Washington and a veteran of the US First Army in the ETO, he has also worked as staff correspondent for *Life* and as a reporter for the *Pasadena, Calif., Star-News*. His first national magazine article was a profile of actress Marilyn Monroe in 1951 for *Collier's*. Married and now living in Hollywood, he concentrates on freelance writing.



THE BIG STICK

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

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

"Speak softly and carry a big stick!"

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

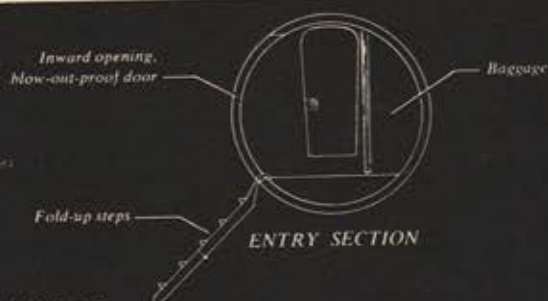
If you are on the watch for tomorrow, watch Martin today.

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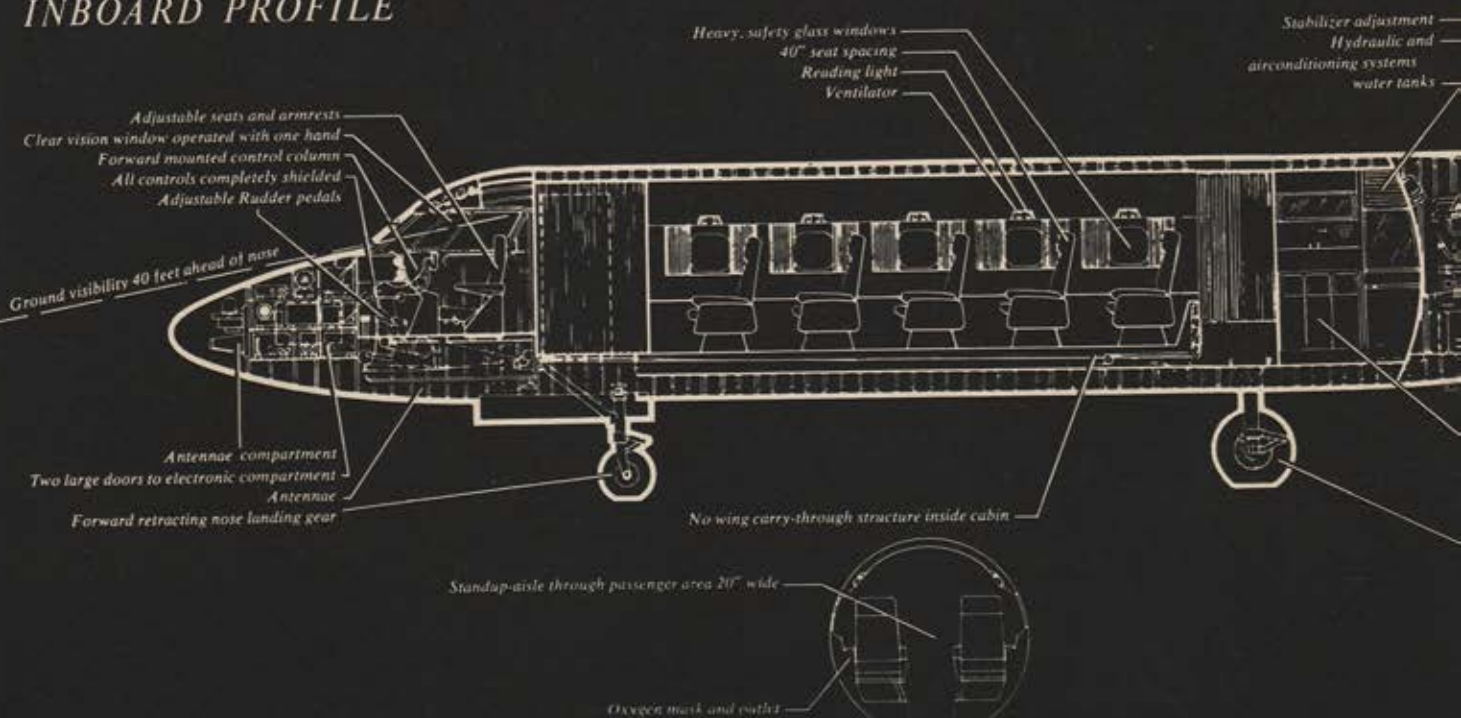


JETSTAR

THE LOCKHEED UTILITY JET TRANSPORT



INBOARD PROFILE



PASSENGER SECTION



ANNOUNCING THE NEW LOCKHEED **JETSTAR**

a 10-passenger utility jet transport with
4 engines, designed to perform a variety of
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Able to match the performance of large jet transports, but at a fraction of their costs, the new swept-wing Lockheed JETSTAR will cruise 500/550 mph at altitudes from 25,000 to 45,000 feet—for ranges of 2,000 statute miles and more.

Amazingly quiet (due to the aft fuselage mounting of engine jet pods) the JETSTAR is ideal for transition pilot training, heavy bomber crew training, and testing ground navigational aids. High-speed navigation training and gunnery practice, in-flight refueling indoctrination, and high-priority cargo carrying are

additional vital uses for which the JETSTAR was designed.

The JETSTAR carries a full complement of radio and navigation gear and is fully pressurized and air conditioned.

Like all Lockheed aircraft, the JETSTAR embodies simplicity of structure and functional systems—for high strength and reliability. Easy to maintain, economical to operate, the JETSTAR carries on the 25-year tradition of Lockheed's leadership in the design and manufacture of high-speed aircraft for the military, commerce and industry.

LOCKHEED means leadership

*Lockheed Aircraft Corporation
Georgia Division
Marietta, Georgia*



Penetration attempt begins with briefing of SAC "saboteur" team by leader, Capt. Ronald Sabold, in motel near the base.

Penetration Team . . .

SAC's SABOTEURS

By
Jim Winchester

PHOTOS BY GEORGE BURNS

IN THE dimly-lit cafe in Fairview, Mass., Mary Ann Hickey, a pretty blonde in a tight-fitting dress, had no trouble at all striking up a conversation with an off-duty airman from nearby Westover Air Force Base.

As the evening progressed, she skillfully encouraged her new-found friend to talk about himself, and he did his best to impress her, boasting of his importance.

In a few hours, Mary Ann knew practically everything the young airman knew of the inner workings at Westover, which is home base for one of SAC's three B-52 jet bomber wings

and headquarters for the US Eighth Air Force.

Later, Mary Ann tapped lightly at the door of a nearby motel cabin and was quickly admitted. A half dozen men awaited her.

For them and for Mary Ann—that is her real name, and she is a WAF A/3C—this was serious business. She and the men were members of a SAC "penetration team," and their mission was to try to enter Westover by any means they could devise, infiltrate the inner ring of security defense, and reach the flight line or other sensitive areas to carry out hypothetical sabotage on planes and facilities.



Left, WAF team member shows how vital security can be breached by careless talk with curious strangers.

Below, team member attempts entry through ruse of hitching ride into base in an officer's automobile.



Left, just one second off guard by the AP allows this pair of penetrators visible in background to slip by gate without showing credentials.

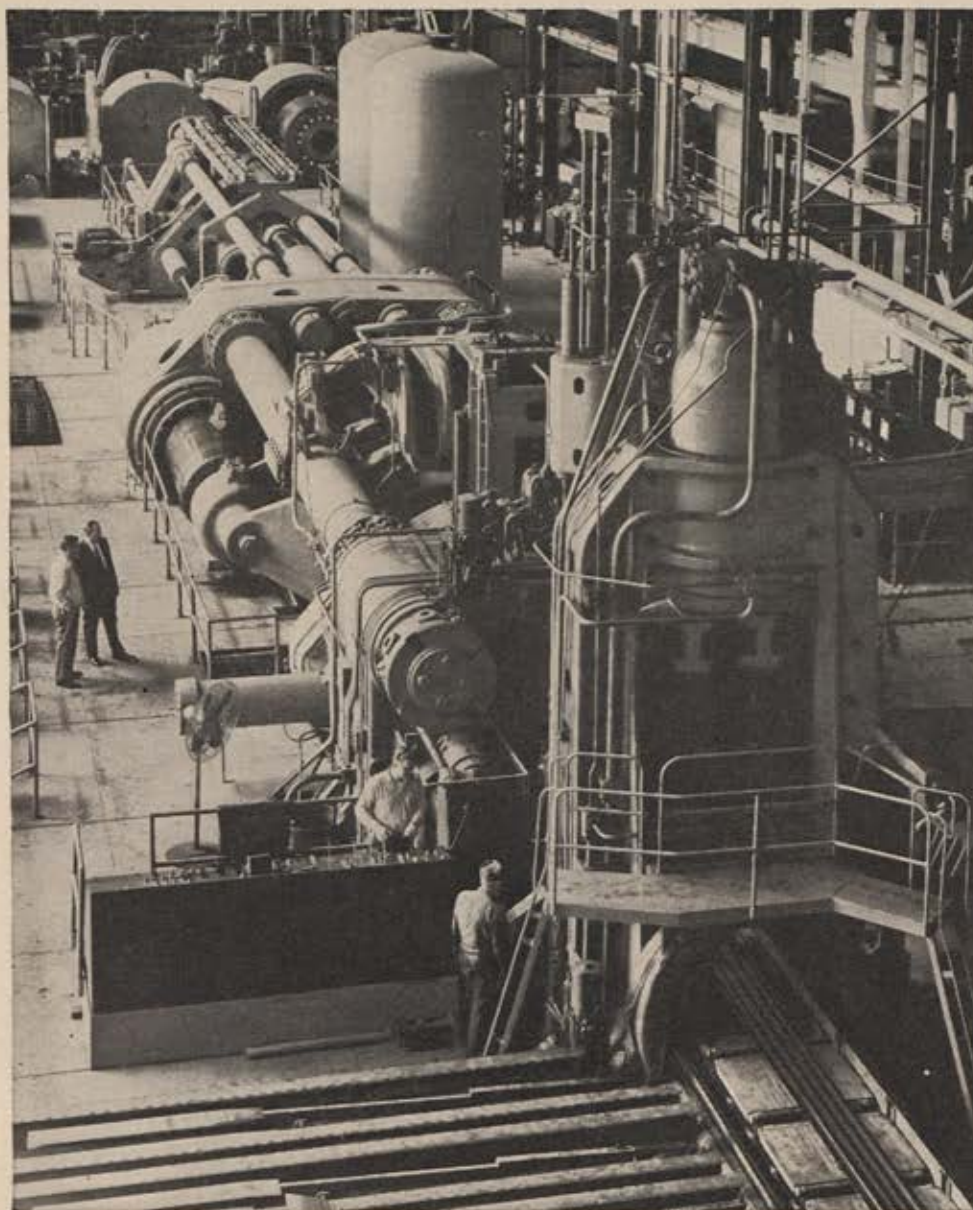
Below, over the fence and into the SAC base is an old, but still sometimes-useful, method of penetrating security ring. It doesn't always work.



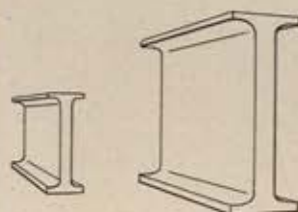
No one on the base—except the commander—knew of their presence.

The idea of this penetration team, and others like it, first operated by SAC in 1953, is to test base security vulnerability and defense. Composed of several enlisted men, usually under an officer, the teams employ every ruse to throw base defenses off guard. They remain in towns near the base for several days, gathering information—as Mary Ann did—before attempting penetration. Forging orders, stealing passes, posing as workmen, scaling fences, they try anything in their effort to reach sensitive areas to

(Continued on page 55)

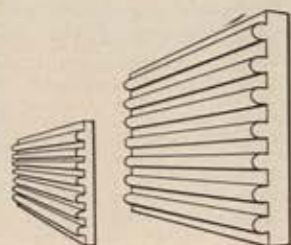


HOW THE 13,200-TON PRESS BOOSTS EXTRUSION CAPACITY



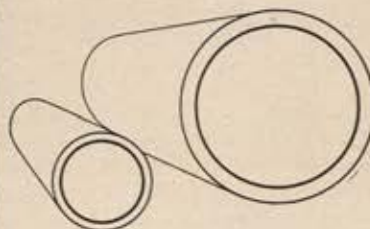
FROM 11" TO 28"

STRUCTURAL SHAPES



FROM 9" TO 20"

STIFFENED SECTIONS



FROM 10" TO 24" O. D.

TUBING

DOW'S NEW EXTRUSION PRESS PACKS 13,200-TON PUNCH

Here's a whole new range of large magnesium extrusions:
24-inch O. D. Tubing 28-inch I-Beams 80-foot-long sections

This mammoth press, newest addition to The Dow Chemical Company's rolling and extrusion mill at Madison, Illinois, is the world's largest magnesium extrusion facility. Its vastly increased capacities afford new opportunities for designers working with light metals. A wide variety of new magnesium applications for aircraft, missile, military and general industrial use are now possible and practical. In addition to extruding magnesium, the press is also available for large aluminum extrusions.

Here's how the big press will increase maximum dimensions of representative magnesium extrusions: Integrally

stiffened sections, from 9 to 20 inches wide; I-Beams from 11 to 28 inches high; round tubing from 10 to 24 inches outside diameter; and maximum lengths of 80 feet. A large number of shapes and forms can be produced, limited only by the design of the die through which the metal is extruded. Many complex shapes that formerly required separate operations can now be formed in one operation.

If your design calls for large magnesium or aluminum extrusions, contact the nearest Dow Sales Office or write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Department MA 1406E.

YOU CAN DEPEND ON





Above, perpetual vigilance against penetration: security and air police are inspected by base Provost Marshal, Lt. Col. Jack Murphy.

Left, penetrator steals an ID badge he'll use in a restricted area.



Above, everyone's identity is checked. Here civilian workers show credentials.

Below, security ring spots and scotches another attempt at a "bomb" planting.



wreak simulated havoc on the base.

Here's how the team works. A few days before the actual penetration is to start, the team leader phones the base commander that his team is in position and gives the commander a code name and phone number for the team command post, which is manned as long as the team operates. This is necessary to prevent enemy agents from posing as teams and playing for

real. Air police and security forces are never informed. SAC plays the game in earnest.

On the other side of the coin, SAC air police and security forces are constantly on alert for all penetration attempts, simulated or real. At Westover, this antisabotage force, composed of several hundred airmen under six officers, is headed directly by the base Provost Marshal, Lt. Col.

Jack Murphy of Fort Worth, Tex.

They are divided into two groups: air police, who man gates, run traffic, check identifications, and issue badges; and the special, larger group assigned directly to security—protecting aircraft, weapons, fuel, supplies, and combat crews—in a word, combat capability.

Together, they comprise a defense
(Continued on following page)



Always ready to take on trouble are roving radio security patrols, on duty as part of SAC antisabotage efforts.



Guard and dog stand watch together as dusk settles over Westover, auguring night and demanding greater vigilance.



Flare device gives away a penetrator who has sneaked onto the field and tripped over wire, trapping himself.

in depth, the first ring of which includes fences and entry gates, where improper credentials are weeded out. On the field itself, vital areas—flight line and fuel and ammunition areas—are protected by additional fences and guard gates. Special restricted area passes are needed to enter and leave these areas. To trap penetrators who might break through the rings, walking guards with sentry dogs and roving radio patrols are used. Around extremely sensitive areas there are trip wires attached to flares, which when gently touched will light up the area and trap intruders.

Says Colonel Murphy: "Every corner of the security setup is linked by phone or radio to Central Security Control Center, where a highly trained, sabotage-alert team is on duty twenty-four hours a day. Any call for help from sensitive areas and this team responds in its special vehicle . . . like firemen answering an alarm."

Ready for all contingencies, including such problems as stalled vehicles, jammed radios, busy telephone lines,

or even capture of Central Control, Colonel Murphy's forces, like those at other SAC bases, operate on two assumptions:

1. That "it can happen here."
2. That, as the colonel puts it, "One man with a rifle, arriving in time, is far more effective than fifty with machine guns who get there just five minutes too late."—END

ABOUT THE AUTHOR

Author Jim Winchester, remembered by readers for his "Milt Caniff's Air Force" in the July 1957 *AIR FORCE*, is a feature writer with *King Features Syndicate*, and has contributed several other articles to this magazine. Photographer George Burns, whose pictures, specially posed, illustrate this piece, is a former *Yank* contributor, now of Schenectady, N. Y. He worked with Jim on "WAF in Paris" and other articles which have appeared here. He specializes in documentary photography and his work has appeared in a number of national publications.



After the exercise, the penetration team members meet with base security chief, Colonel Murphy, to talk over mission. Discussed are areas where penetrations were made and where even stronger security is needed for added base defense.



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Engineers, Scientists—Perhaps you, too, can work with America's *first* rocket family. You'll find the problems challenging, the rewards great.



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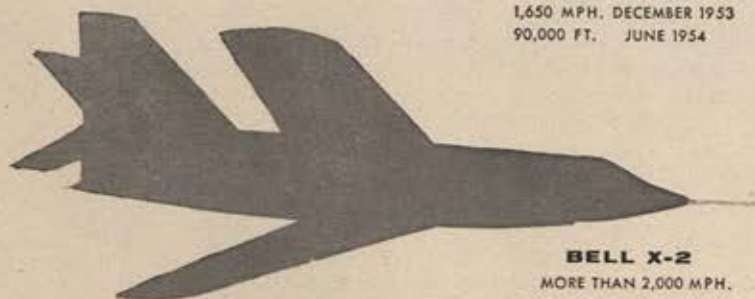
A MEMBER OF THE OMAR TEAM



BELL X-1
NEARLY 700 MPH. OCTOBER 14, 1947



BELL X-1A
1,650 MPH. DECEMBER 1953
90,000 FT. JUNE 1954



BELL X-2
MORE THAN 2,000 MPH.
and 126,200 FT. SEPTEMBER 1956

10 YEARS BEYOND THE SONIC BARRIER



...AND INTO THE SECOND DECADE
OF SUPERSONIC FLIGHT

Aviation history was made on October 14, 1947 when the Bell X-1 reached a speed of nearly 700 mph. Man had broken the sound barrier for the first time!

The rocket-powered X-1 thus opened the door to a decade of significant advances in high-speed, high-altitude flight. A few years later the Bell X-1A, successor to the X-1, set a new speed record of 1,650 mph and a new altitude record of 90,000 feet.

Then, still working in conjunction with the U. S. Air Force and the National Advisory Committee for Aeronautics, Bell produced the X-2 which reached more than 2,000 mph and 126,200 feet...the fastest and highest that man has ever flown.

Never intended for tactical operation, these experimental aircraft made invaluable contributions to aerodynamic design and the art of supersonic flight. They left their marks on the airplanes of today and tomorrow and blazed the trail to the supersonic age.

Today, ten years after the first flight beyond the sonic barrier, the team of Bell engineers responsible for the famous series of X-airplanes, is working on even more advanced aeronautical concepts. One of the more challenging of these is an aircraft which will combine the ability to take off and land vertically with the high speed and performance of a conventional jet.



Aircraft Division
BUFFALO, N. Y.



Food service airmen ready freshly baked home-style raisin cookies to top off meal.

AIR FORCE CAREERS

NO. 10 OF A SERIES

Food Service—New Look

By Flint O. DuPre

JOE'S Messkit Beanery is an unlamented thing of the past as Food Service—like the rest of the jet-age Air Force—keeps pace with latest development and techniques. In the Beanery's place is a highly skilled culinary art approaching the French school of fine eating.

Imagination, thoughtful preparation, improved quality, liberal use of seasonings, as well as the newest methods of serving, are largely responsible for revolutionary changes in this all-important career field—changes that would cause an old-line sergeant coming in for another hitch to rub his eyes (and his stomach) in pleasant wonder.

The improvements stem from ac-

tions by Air Force personnel officials to better career service for individuals. A basic approach, they reasoned, would be via hungry airmen's stomachs.

First step in the program was elimination, where possible, of dreaded KP, with civilian firms providing complete food-handling service so that airmen might devote full time to military duties. Another change was substitution of colorful glass dishes for the traditional steel trays, giving a much more appetizing and homelike atmosphere to what are now called "dining halls" instead of "mess halls." Incidentally, that old expression "chow" is rarely used now.

In the attractive new-style dining

halls that are making better meals even more palatable, some airmen now eat at four-man tables with place settings, hear music during the meal, and glance at pleasant murals.

Menus like the following are more and more usual throughout the Air Force: Grilled steaks, French fries, buttered peas, salad with choice of dressing, garlic toast, chilled watermelon, cupcakes, ice cream, iced tea or hot coffee. And the food is kept at proper temperatures with the latest techniques.

To an old-timer like T/Sgt. John H. Shrunk, who has eaten his way from Alaska to the Philippines to Korea and back to the States in twenty-two

(Continued on following page)



Expert preparation of steaks assures gustatory pleasure in AF dining halls.

service years, the new-style food service is the "mostest."

Sergeant Shrunk and dozens of other Air Force food service careerists are attending classes at the Portsmouth AFB Food Service Academy, N.H., where eighty hours of classroom and field trip instruction emphasize good management and development of more attractive dining facilities. Some of the instructors are drawn from Air Materiel Command, which is responsible for many of the improvements in this career field.

There is competition throughout the Air Force for culinary achievement, and this year the competition was underscored by the race for the newly established Hennessy Trophy, a civilian award to the best food service unit, given by the International Stewards and Caterers Association.

First winner of the trophy was the 1608th Food Service Squadron, MATS, Charleston AFB, S. C., commanded by Maj. Louis D. DeFelice, with four dining halls supervised by M/Sgt. Ernest P. Jackson.

In contrast to military yesteryear, food service today is a science of applied food technology, nutrition, and dietetics. Food is prepared from

a master menu sent down from Air Force Headquarters, and although a squadron may add to the master menu, it may never lessen it. An airman, wherever he is stationed, is entitled to 4,000 calories per day—and he gets them in the most palatable and attractive portions possible under highest sanitation conditions.

The airmen who make this possible are holders of AFSC 62000 and its variations in the Food Service career field. At the superintendent level, they are warrant officers, while baking, food service, and dining hall supervisors are generally master sergeants. Other airmen have varied grades, including bakers, cooks, meatcutters, and helpers. There are also apprentice cooks and bakers learning their skills in special training schools.

These careerists are experts in storage, preparation, and serving of foods. They know kitchen and dining hall organization and maintenance, and keep abreast of new methods.

And their vital role in the Air Force is dramatically underscored every time a crowd of hungry airmen pours into the new-style dining rooms for healthy portions of good food, well prepared.—END



Airmen at Lincoln AFB, Neb., enjoy tasty meals in new-style dining hall, pleasantly decorated to add pleasure to eating.

AROUND THE WORLD WITH SIKORSKY HELICOPTERS



HEAVY HAULING—Big Sikorsky S-56-type helicopters (Army H-37) have demonstrated many uses, carrying troops, supplies, vehicles and weapons. A big H-37, above,

carries a heavy Army truck during recent demonstrations for The Army Aviation Board. H-37s are undergoing rigorous field testing at Ft. Rucker, Alabama.



TURBINE-POWERED S-58—This turbine-powered Sikorsky S-58 has been flying since the beginning of the year. Built under an experimental Navy program, the test bed is equipped with two General Electric T-58 gas turbines, each rated in excess of 1000 hp. Performance is classified.



SIKORSKYS TO CHILE—With the delivery of four S-55 helicopters, Chile becomes the 23rd nation to operate Sikorsky helicopters. The Chilean Air Force will fly these versatile helicopters in air-sea rescue duty, service in which the S-55 has been conspicuously successful.



SIKORSKY AIRCRAFT

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The General Motors Matched Team of Allison Prop-Jet Engines and AeroProducts Turbo-Propellers is Proving Itself Every Day as a Versatile and Dependable Power Plant for Military and Commercial Air Transportation



EXPERIENCE WHERE IT COUNTS MOST—IN THE AIR. The Allison Turbo-Liner, a modernized commercial cargo-transport (top), a YC-131C military transport (center), and the famed Lockheed C-130 Hercules combat-cargo transport—all powered by Allison Prop-Jet engines and AeroProducts Turbo-Propellers—are making aviation power-plant history. Flying from the Allison Flight Test Research Facility at Indianapolis, these planes are accumulating power-plant data in a round-the-clock accelerated flight-test program unsurpassed in the field of modern Prop-Jet engine and Turbo-Propeller operations.

ALLISON DIVISION OF GENERAL MOTORS, Indianapolis, Indiana



ALLISON PROP-JET POWER



The PACIFIC AIR FORCES

*The story of the Air Force's newest
major command and its role in the streamlined
military setup in the Pacific*

NEW PACIFIC COMMAND STRUCTURE

By Gen. Laurence S. Kuter

COMMANDER IN CHIEF, PACIFIC AIR FORCES

AT 0001, July 1, 1957, when the new Headquarters Pacific Air Forces was inaugurated, a long-sought objective of the USAF was attained. For the first time in its history all USAF fighting forces assigned to the Pacific and the Far East areas were consolidated under a single commander in the field.

The disastrous consequences of divided commands were brought vividly to light at Pearl Harbor on December 7, 1941, and a day later in the Philippines. Arbitrary divisions between over-all American commands existed in varied degrees until July 1, 1957.

Only a month after Pearl Harbor, command of air units was divided four ways under the loose confederation of Gen. Archibald P. Wavell's over-all command of the armed forces of four nations—American, British, Dutch, and Australian. ABDA was urged to employ its available air forces to secure control of the air. ABDA used the limited air forces that were available in a piecemeal manner. ABDA was defeated piecemeal and was driven out of existence by a vigorous Japanese offensive after only six weeks.

After ABDA, in the Pacific and Far East, elements of American air forces were parceled out to several commands.

(Continued on page 66)

COMPONENT COMMANDERS



Commander in Chief, Pacific
Adm. Felix B. Stump,
US Navy



Commander in Chief,
US Army, Pacific
Gen. Isaac D. White,
US Army



Chief of Staff
Vice Adm. George W. Anderson Jr.,
US Navy



Deputy Commander in
Chief, US Pacific Fleet
Adm. Maurice E. Curtis,
US Navy



Deputy Chief of Staff,
Plans and Operations
Maj. Gen. Hunter
Harris, Jr.,
US Air Force



Deputy Chief of Staff, Foreign
Military and Civil Affairs,
Logistics and Administration
Maj. Gen. Edwin J. Messinger,
US Army



Commander in
Chief, Pacific Air Forces
Gen. Laurence S. Kuter,
US Air Force

*Admiral Stump retains the title of Commander in Chief, US Pacific Fleet, acting on matters of major fleet policy.

THE PACIFIC AIR FORCES

Hq. Pacific Air Forces
Hickam AFB, Oahu, T.H.



Commander in Chief
Gen. Laurence S.
Kuter



Chief of Staff and
Vice Commander
Maj. Gen.
Emery S. Wetzel

Deputy Chief of Staff,
Administration and
Logistics
Maj. Gen. Matthew
K. Deichmann



Secretariat
Col. Robert P.
Riordan



Assistant Chief of Staff,
Personnel (A-1)
Col. William H. Leach



Assistant Chief of Staff,
Comptroller (A-8)
Brig. Gen.
Robert S. Macrum



Assistant Chief of Staff,
Material (A-4)
Brig. Gen.
Harry C. Porter



Assistant Chief of Staff,
Installations (A-7)
Col. Howard E.
Webster



Protocol
Maj. Oliver M.
Noland



Assistant for Safety
Col. Ira F.
Wintermute



Inspector General
Col. Raymond L.
Curtice



Command Surgeon
Maj. Gen.
Oliver K. Niess

Hq. Fifth Air Force, Fuchu



Commander
Lt. Gen. Fredrick H.
Smith, Jr.

Hq. Thirteenth Air Force,



Commander
Maj. Gen.
John B. Ackerman



Assistant Chief of Staff,
Plans (A-5)
Brig. Gen. Lawson
S. Moseley, Jr.



Staff Judge Advocate
Brig. Gen.
Frank P. Corbin, Jr.



Deputy Chief of Staff,
Plans and Operations
Maj. Gen.
John S. Hardy



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Intelligence (A-2)
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Command Adjutant
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Coleman



Commander
Brig. Gen. Kurt M. Landon



Assistant Chief of Staff,
Operations (A-3)
Brig. Gen.
Ralph E. Koon



Staff Chaplain
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Commander
Brig. Gen. Charles H. Pottenger



Information Services
Col. Chauncey B.
Whitehead



Commander
Brig. Gen.
Kurt M. Landon

An AIR FORCE Magazine Photochart

(Corrected as of September 15, 1957)



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Deputy for Intelligence
Col. William S. Boyd



Deputy for Operations
Col. Thomas K. McGehee



Deputy for Materiel
Col. Lawrence F. Carlberg



Deputy for Comptroller
Col. Dean B. Yount



Deputy for Installations
Col. Ralph F. Schmidt



Inspector General
Col. Junius W. Dennison

Air Station, Japan



Chief of Staff and
Vice Commander
Maj. Gen.
Kenneth B. Hobson



Assistant for Safety
Col. William A. Bowie



Adjutant
Maj. Stephen Celoc



Chaplain
Col. Stanley M. Powers



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Col. Lewis B. Arnoldi



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Col. Willis L. Heimentoler



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39th Air Division
Brig. Gen.
James O. Guthrie



Commander,
41st Air Division
Brig. Gen.
Cecil P. Lessig



Commander,
43d Air Division
Col. Ladson G.
Eskridge, Jr.



Commander,
313th Air Division
Brig. Gen.
William G. Hipps



Commander,
314th Air Division
Brig. Gen.
Thomas J. Gent, Jr.



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Deputy for Intelligence
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Deputy for Operations
Col. John E. Atkinson



Deputy for Materiel
Col. William D. Campbell



Deputy for Comptroller
Col. Ralph C. Embrey



Inspector General
Maj. William E. Mayo

Clark AFB, P.I.



Chief of Staff and
Vice Commander
Col. Kermit D.
Stevens



Assistant for Safety
Maj. Jack P. Kern



Adjutant
Lt. Col. Earl D. Seal



Chaplain
Lt. Col.
Thadieth E. Son



Surgeon
Col. James W.
Humphreys, Jr.



Staff Judge Advocate
Lt. Col.
Stanley S. Butt



Information Services
Lt. Col.
Edward I. Kandel



Commander, Marianas
Air Defense Division
Col. William R.
Cameron



Commander,
ATF 13 (Prov.)
Brig. Gen.
Fred M. Dean

Division, Wheeler AFB, Oahu, T.H.



Chief of Staff and Vice Commander
Col. Clayton B. Claassen



Deputy for Personnel
and Administration
Lt. Col. Elmer G. Carlson



Deputy for Materiel
Lt. Col.
Benjamin Norcia



Deputy for Operations
Col. Hallock P. K.
Walmsley



Air National Guard
Adviser
Lt. Col.
John C. Giraud

Cargo, Tachikawa AFB, Japan



Chief of Staff and Vice Commander
Col. William M. Brown



Deputy for Personnel
Col. Willard A. West



Deputy for Operations
Col. William C.
Lindley



Deputy for Materiel
Col. Russell W. Gray

Command, Hickam AFB, Oahu, T.H.



Deputy Commander
Col. Joseph B.
Stanley



Director for Personnel
Lt. Col.
Herbert L. Fleischer



Director for Operations
Lt. Col.
Carl V. Schott



Director for Comptroller
Lt. Col.
Keith I. Wiese



Director for Materiel
Lt. Col.
Lewis A. Winkle

Under MacArthur's command was the Fifth Air Force. In the southwest Pacific under a succession of admirals was the Thirteenth Air Force. In the central Pacific under different admirals was the Seventh Air Force, and toward the end of the war there was, in addition, a US Strategic Air Force in the Pacific under Gen. Carl A. Spaatz, operating directly under Gen. H. H. Arnold as a member of the Joint Chiefs of Staff.

It was even more complicated in the China-Burma-India theater. The US Strategic Bombing Survey reported that by the end of 1943, "There evolved the most fantastic and involved military organization the world had ever seen. Five colors of ink in solid, broken, and dotted lines were required to depict the various relationships" in the Southeast Asia Command.

Then in June 1944 the Far East Air Forces command was established under Gen. Douglas MacArthur's control and Gen. George C. Kenney's command. For the final attack of the home islands of Japan, FEAF controlled the Fifth, Thirteenth, and Seventh Air Forces.

After Japan's surrender, the Strategic Bombing Survey presented these conclusions: Control of the air was essential; greater economy of force was possible; and, "the lessons strongly support . . . organization which provides unity of command. . . ."

Finally, just prior to July 1, 1957, there had been the Seventh and the Thirteenth Air Forces assigned to the Pacific Command and operating under the command of Adm. Felix B. Stump, Commander in Chief. At the same time, the Fifth and other USAF combat units based in the Far East had operated under the command of Army Gen. Lyman L. Lemnitzer, Commander in Chief, within an arbitrary boundary including Okinawa, Korea, and Japan called the Far East Command.

As a result of the lesson at Pearl Harbor, the Air Force has continually endeavored to consolidate the command of all of its combat units based in the Pacific-Far East in a single command shorn of committees in the Pentagon. The overriding reason for consolidation has been the Air Force's desire that one military commander on the spot should have capability to move instantly any or all elements of the USAF wherever they might be needed to meet emergencies.

When it was necessary to move USAF combat units from the Thirteenth Air Force from the Pacific Command to Japan and Korea in the Far East Command to meet Communist military aggression in Korea, the mobility inherent in the flying units in the Thirteenth Air Force could not be exploited adequately. The units could fly in a matter of hours from their base in the Philippines across the arbitrary boundary between the Pacific and the Far East areas of command to fight in Korea. However, days were consumed by securing agreement and coordination between the many commands involved and authority from the Joint Chiefs of Staff committee in the Pentagon to direct the move. The mobility of the combat units and the flexibility of airpower were limited not by capabilities of combat air units but by command, administration, and logistics arrangements.

In 1955 when Communist pressure was forcing the evacuation of Nationalist Chinese forces from the Tachen Islands, FEAF's 18th Fighter-Bomber Wing was ordered from Okinawa across the arbitrary command boundary into Taiwan.

It took twelve hours for this powerful fighting force to transfer itself along the China Sea. Twenty minutes after landing, the unit was flying scheduled missions.

The execution of this maneuver was near perfect, and a tribute to the men who planned and performed it. However, the delay in getting this unit orders to move was a

serious flaw which might very well have caused it to fail.

This delay can in no way be called the fault of any individual. It was the failure of the system. Authority to move our air units from one command area to the other was vested only in the Joint Chiefs of Staff in Washington. This caused delays that worked against a quick transfer in emergencies such as the Tachen maneuver and the Korean War. The command concept and administrative setup of the Pacific was not geared to jet-age mobility.

Rapid movement to meet potential air threats is a basic essential of the jet age, but it is especially an acute problem in the vast reaches of the Pacific-Far East. Recently a replacement pilot was taken for an orientation flight at Chitose, the most northern air base in Japan. As the T-33 circled the tip of Hokkaido the pilot banked and pointed to a hazy land mass to their left. He spoke into the intercom and the newcomer heard these words:

"That is Russian-held territory. And it is just three minutes away by jet!"

This story underlines what each newcomer to the Far East quickly learns. With a potential enemy only three jet minutes away, there is no time to get ready. You have to be ready.

There are over 100 major air bases in the Communist Far East capable of striking at Japan, or at Korea, or Taiwan. Some of the bases were on one side of the arbitrary line and some on the other. Under the divided command system, we could not marshal our full retaliatory force where and when needed. Those stationed in the other area would require permission from Washington to move to the threatened command.

Now this dangerous handicap to the mobility of our Far East-based airpower has been removed by the activation of the new Pacific Command with the Pacific Air Forces as its air component. Over-all executive authority now rests in the Commander in Chief, Pacific—one man—not only in a committee several thousand miles away.

The new Pacific Air Forces and its predecessor, FEAF, are proud of having helped to bring about this new organization. It ranks as one of FEAF's major accomplishments.

The consolidation of forces has been an Air Force goal since 1944. At that time General Arnold recommended to Gen. George C. Marshall that an air commander should be appointed in the Pacific on the same level as General MacArthur and Adm. Chester W. Nimitz. He would be responsible to a single theater commander. This formal proposal was disapproved by the War Department General Staff.

FEAF's long-term policies and objections to the divided command system have been expressed many times. In November 1954 they were registered in a formal recommendation to the Chief of Staff, USAF.

This study recommended establishment of a single air component to provide centralized direction of airpower. It recommended establishment of clear and effective targeting and delivery responsibilities in connection with JCS atomic directives.

It also called for major redeployment of FEAF's air forces and for establishment of wide dispersal and protective facilities. Finally, it recommended a greater cooperation with the national air forces of our Free World friends in this area.

This FEAF study was approved by the Air Force Council and used as the USAF position before the Joint Chiefs. Then, in June 1955, the Secretary of Defense initiated a review of the command structures with a view to simplifying, reducing, and consolidating them.

The existing command structure was found adequate; (Continued on page 69)

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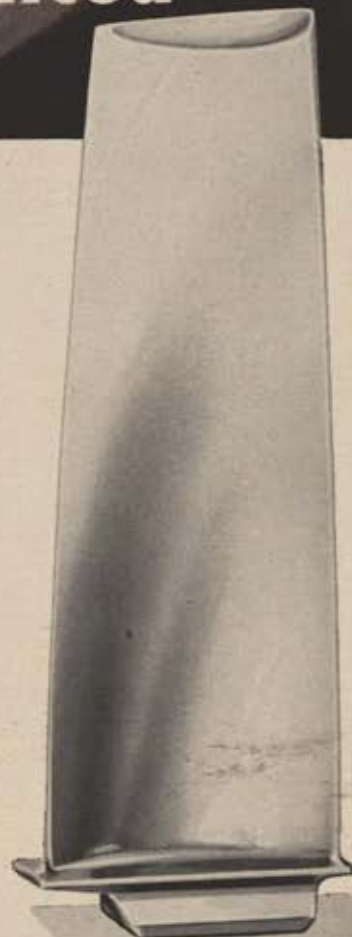
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studies submitted by the two Pacific area commands were considered in reaching this decision.

Finally, on June 21, 1956, a new Unified Command plan was approved by the Secretary of Defense. Planning began at once for the organization to permit smooth transfer of responsibilities to the expanded Pacific Command. An outline plan was submitted to the JCS.

FEAF immediately presented its strongly held views to Headquarters USAF, listing five exceptions to the plan as presented, and making three recommendations.

The first of these recommendations was that all combat forces be under command and operational control of component commanders. Thus, the air commander attached to Pacific Command would have operational control of Air Force units.

The second recommendation urged that the air component commander for CINCPAC have general responsibility for air defense.

The final recommendation was that the senior air service commander in Japan be made the coordinating authority for joint service matters and that the establishment of a subordinate joint command in Japan thus be avoided.

These recommendations were utilized in an Air Force position paper submitted on November 6. After receipt of papers from the Army and Navy, an ad hoc committee was appointed to bring the divergent views into line.

On December 28, 1956, the JCS issued their outline plan for the disestablishment of the Far East Command and movement of the United Nations Command to Korea.

This plan called for dissolving the Far East Command, relocation of the UNC in Korea, establishing a subordinate Unified Command in Japan, and required CINCPAC to submit by January 1, 1958, recommendations for further consolidating subordinate unified commands of the Pacific Command. It also called for normal exercise of unified command of major combatant forces through the service component commanders, desired CINCPAC to disassociate himself as soon as possible from direct command of the Pacific fleet, and stated that the Navy would become the executive agency for the United Nations Command by July 1, 1958. The Commander, Fifth Air Force, was designated as head of the subordinate Unified Command in Japan.

The consolidation of the Pacific Command and the expansion of FEAF into the Pacific Air Forces has achieved the unity of command so long sought and so essential to the proper use of airpower. FEAF should properly take pride in its part in bringing this about. It is a major achievement.

Within FEAF there have been other accomplishments, some of even greater caliber. It is unnecessary to recall the vital role played by FEAF in World War II and in Korea. Today the accomplishments of FEAF are important only inasmuch as they lay the foundation for the Pacific Air Forces and guide the new organization in its future course.

What then is the future course of Pacific Air Forces?

Primarily, to follow the advice George Washington once stated to Congress: "To be prepared for war is one of the most effective means of preserving peace."

This has always been the guiding spirit of the Air Force in the Pacific-Far East. We have helped to preserve the peace by intense preparation. With the constant reminder before us that a potential enemy is only three jet minutes away, we have had an urgent incentive. But there has been more than just maintaining and increasing our own combat potential. There has been our assistance to the other free nations of Asia—Japan, Nationalist China, the Philippines, the Republic of Korea, Thailand, and the others. Through

the Military Assistance Program and the hard work of a lot of Air Force people, these countries have built up more than fifty squadrons of combat aircraft among them—and more are planned.

Our future depends upon our ability to maintain the friendship and support of Free Asia.

No one of these nations' forces, nor our own, can match the Communist air forces arrayed against us. We all must strengthen our lines of cooperation with the other national air forces of the Far Eastern allies to prevent the piecemealing of units which destroyed the American-British-Dutch-Australian command in the early days of World War II.

We in the new Pacific Air Forces must continue FEAF's roles of diplomats, economists, teachers, and businessmen. Making friends is a basic and vital part of our work. Each of our bases has its own community-relations program. Here good community relations automatically become good foreign relations.

An interesting example of friendly association was the Free Asian Air Force commanders get-together at Baguio, Luzon, P. I., in May 1956. This important meeting brought together the top air commanders of Australia, Nationalist China, the Republic of Korea, the Philippines, Thailand, Vietnam, Cambodia, Taiwan, Great Britain's RAF from Hong Kong and Singapore, and our own Far East Air Forces.

Those of us who attended were interested by a story about the meeting which appeared in the Hong Kong newspaper. It was called "The Secret Confab That Never Was."

After the meeting was announced, reporters refused to believe that this was simply an occasion for senior air force officers of friendly nations to get to know each other on a "first-name basis." But it was just that.

Robin Hutcheson summed it up in his Hong Kong story like this: "The idea of Operation Roundup was that the new American commander of the Far East Air Forces simply wanted to get to know some of his friends in the same line of business. . . ."

"From these meetings valuable contacts should be formed and liaison between friendly air forces improved."

"The idea of these gatherings is certainly one that corresponds to the present trend in Western policy—to consolidate friendship by quiet unspectacular diplomacy."

In 1954, FEAF actions were directed on a major scale to supporting the French and Vietnamese in their fight against

(Continued on following page)

ABOUT THE AUTHOR



An airman since 1930, when he transferred to the Air Corps from the Field Artillery, General Kuter is a 1927 West Point graduate and a frequent writer on military aviation matters. Author of a plan for airpower techniques later used during World War II, he was staff assistant for war plans to Gen. H. H. Arnold during the war and later participated in the organization of the Strategic Air Forces in the Pacific. Named first commander of MATS after its organization in 1948, he served later, from 1953 to 1955, as commander of the Air University, Maxwell AFB, Ala., and represented the US, with rank of minister, at the council of the International Civil Aviation Organization. He was named FEAF Commander in 1955, the post he held prior to his new assignment in the PAF. He holds the DSM, Legion of Merit, and many other honors.

Communist aggression. There FEAF had an opportunity to test the effectiveness of its training and proved the methods which we are carrying forward into Pacific Air Forces.

During these operations, some twenty C-119s proved our ability to provide material, maintenance, and other support with commendable speed, over great distances and in large quantities. The pipeline from Ashiya Air Base, Kyushu, Japan, to Indochina was more than 2,000 miles long.

In August of 1956, FEAF C-124s also demonstrated their ability to fly long-distance supply missions. This was a mercy mission to East Pakistan, then suffering the worst floods in its history.

Two years ago FEAF pilots were flying F-94s, F-86s, F-84s, B-29s, and B-26s. Today in Pacific Air Forces we have F-100s, F-84Gs, and B-57s. For better reconnaissance we are now equipped with RF-84Fs, RB-50s, and RB-66s.

The Air Materiel Command's Pacific logistic support system deserves much of the credit for the smoothness of our changeover in aircraft. Particularly noteworthy is the weapon system support concept as applied to the introduction of the F-100s. This enabled us to phase in these complex aircraft and, at the same time, establish AOCP (aircraft out of commission for parts) rates several times smaller than those reported from ZI bases.

With the accomplishments of FEAF as its solid foundation, the Pacific Air Forces, operating under its new and more logical command system, is entering an area of more effective utilization of airpower. Despite the accomplishment of many of our objectives, many important tasks and objectives still face us in the Far East.

Our airmen, at radar warning posts in Japan, Korea, and Taiwan, are watching radar scopes and seeing more Communist aircraft flying higher and faster, and flying from new Communist bases. This military buildup is driving ahead at the same time that the Communists talk of disarmament.

We have the delicate task of making sure that the beguiling tactics of sweet persuasion do not obscure the avowed Communist objective of domination of the natural resources, industrial capacities, and the vast populations of Asia. Complacency will be fatal. We must continue to recognize the need for common defense—both militarily and psychologically—against tyranny in its current guise. While the Pacific Air Forces is improving its combat potential qualitatively and quantitatively, we must not forget that the airpower situation in the Far East cannot be viewed in exclusively military terms. Air Force doctrine divides national power into four basic elements, defined as the political, the economic, the military, and the psychological. The latter includes the moral force that a nation can exert.

In the Far East, all of these instruments of power are being used: offensively by the Communists, and in a counteroffensive by the Free World. We have the continuing task of finding the correct solutions for each new facet of the changing problem of meeting Communism's challenge, militarily and psychologically, as it relates to and threatens the Pacific area.

I am confident that we can generate the skills and effort to keep this problem solved. Communist airpower, stronger than its opposition in the local area, has not been used offensively since Korea. The problem of keeping the peace has been solved to date. It can be kept solved.—END

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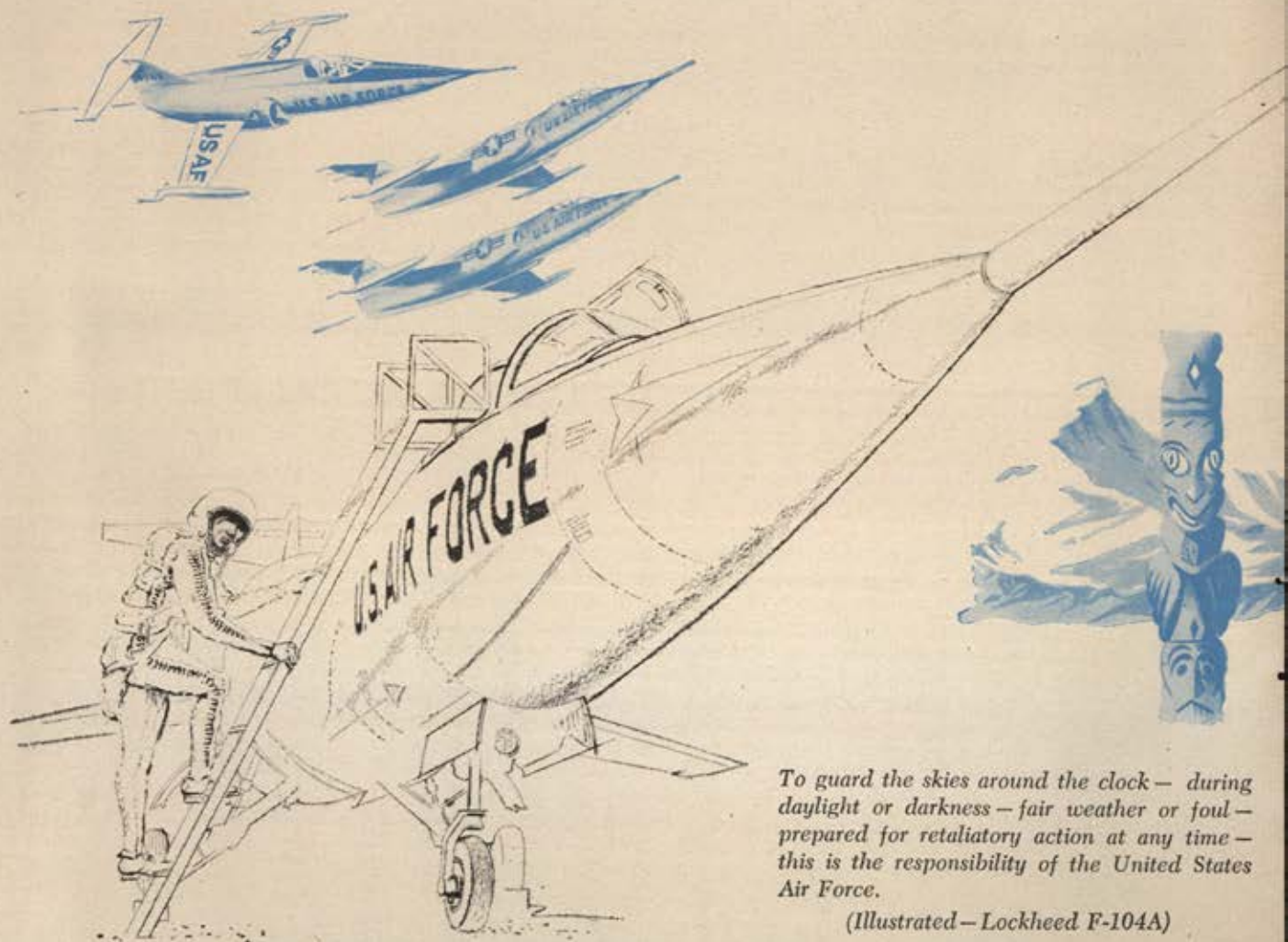
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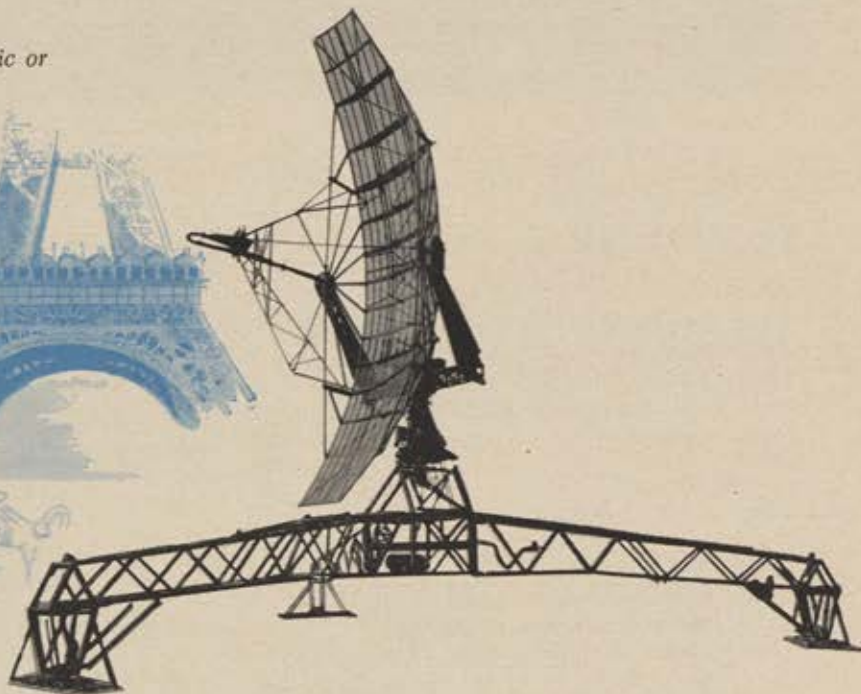
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Home of the Air Force Nomad

Spokane . . . Plattsburg . . . El Paso . . . Montgomery . . . and Caribou. To these add a generous portion of overseas duty and you have some of the homes of the Air Force man. This man is a nomad. Though he has changed the baggy dress for the Air Force blues, the camel for the B-52, and the desert for the sky, he, like his ancient cousin, is destined to "wander" from oasis to oasis.

Before World War II the airman stayed pretty close to his base and was able to obtain most of his social, academic, and recreational needs from the base. However, since World War II the USAF has outgrown these bases, and the airman must depend on the communities for his housing, schools, church, and many social activities.

On the air base everyone is military and everyone understands the problems common to nomadic life. Here it is not difficult for new arrivals to meet people. Choice of schools and housing is limited and rents are firmly set. Doctors are available at the base hospital. Youth programs in most cases are already established. Social entertainment is provided by service, noncommissioned officers' and officers' clubs. All these facilities make it easier for the Air Force nomad to join in and participate in his new setting.

But moving into a civilian community is more difficult.

As a nomad officer with fourteen years of service, my homes have been in Africa, England, Japan, Korea, and at least seven of our forty-eight states. Taking part in community activities has given me a personal satisfaction and an important sense of belonging. This feeling has enriched my life and has helped my family, not only to accept this nomadic life, but to take advantage of the opportunities it offers.

Fellow nomads have often argued the point of participation in community life. Their most frequent comments: "Why get all involved? We are transients." "Civilians just don't understand our problems." Many civilians think the peacetime military life is a plush one of many benefits, no medical bills, and no taxes. The men who make these statements are only looking at one side of the picture. Civilian-military relations are important to our country and if the civilians do not understand us it may be because we

have not taken time to know these civilians nor given them the chance to know us. Because these relations are so vital to our country's welfare, civilian and military alike, we, as Air Force personnel are obligated to be good-will ambassadors.

How do we become ambassadors? What approach can we take in order to become accepted in the community and how do we make this community our community? The answers to these questions are important. Interviews with some of the civic leaders in Montgomery, Ala., proved enlightening and gave me some constructive advice.

Every community offers you at least three avenues of approach: the church, the school, and the Chamber of Commerce. Most churches have some plan for welcoming you. Members may call on you and extend an invitation for you to attend their Bible class, Sunday School, or regular church service.

The Rev. Alfred Bixler, pastor of the Memorial Presbyterian Church of Montgomery, and former president of the Montgomery Ministerial Association, said that there were many Air Force personnel in his church. His church welcomes all Air Force families. (Continued on following page)

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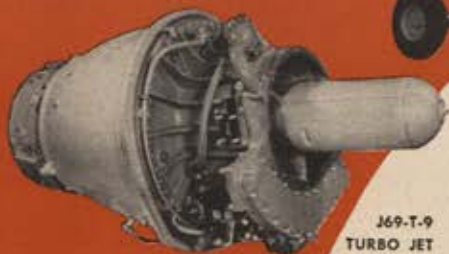
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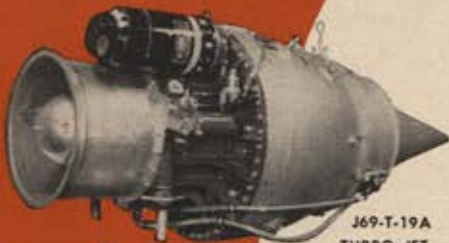
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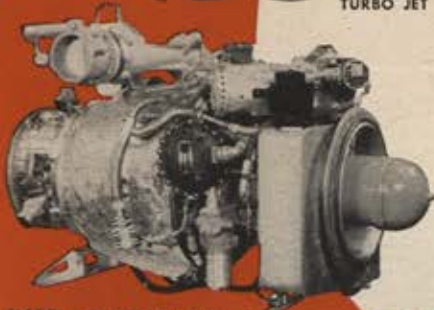
RYAN Q2 FIREBEE
TARGET DRONE



J69-T-9
TURBO JET



J69-T-19A
TURBO JET



MODEL 141 GAS TURBINE
AIR COMPRESSOR

CAE power chalked up another record recently, when a Ryan XQ-2B Firebee jet target drone set unofficial world's records of 53,000 feet altitude and 104½ minutes of flight at Holloman Air Force Base.

The J69-T-19A is one of three gas turbines now in production at CAE. A second version, the J69-T-9, powers Cessna and Temco jet trainers for Air Force and Navy respectively, while the Model 141 air compressor is the heart of the TC-106 mobile starting unit for jet aircraft.

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lies and he assured me that churches throughout the city are equally eager to welcome you. Reverend Bixler told an interesting story about a lieutenant colonel who was attending his church. The colonel took no active part in the church functions until his wife started teaching a Sunday School class and his children joined in some of the social groups. This was the spark the colonel needed, and he plunged into things so actively that the congregation elected him a deacon. Later, he became president of his men's Bible class. This officer made so many friends in Montgomery and liked the community so well that he decided to return when he retired. Through this one avenue of community service, this man found the deep sense of belonging that is so important to all USAF nomads. Letters from many other Air Force personnel have told a similar story. Once they became a living part of the community, they found this feeling of belonging.

Schools offer the second avenue of approach to your community. Besides the pressing need of the Parent-Teacher Association for parent participation, there are numerous other contributions you can make. Teachers scratch their heads trying to figure out novel ways to spend recess time on rainy days. Offer your collection of foreign stamps, rocks, jewelry, or pictures. Learn what part of the world your children are studying, and if you've been there, offer to go to the school and tell the children simple stories of how foreign children live. You will find your contribution more than welcome and appreciated by the teachers as well as the children. Base film libraries have many interesting films that you may borrow and make available to school classes. You can contribute in many ways to the institutions that exist only to educate your children.

Through the schools your children will meet friends and want to join them in their scouting, athletic, and social groups. Adult leadership is needed in all these groups. Be one of these adults. Many athletic teams, such as basketball and baseball, are sponsored by the YMCA and the YWCA. The best of these teams represent their town in intercity tournaments. Any child would feel he "belonged" if he made one of these teams. Not all children can make a team, but if dad or mother is making a contribution, it will make the child feel more secure in the group. Chaperoning or

(Continued on page 81)

HOW WE WORK STEEL TO MAKE STEEL WORK FOR YOU



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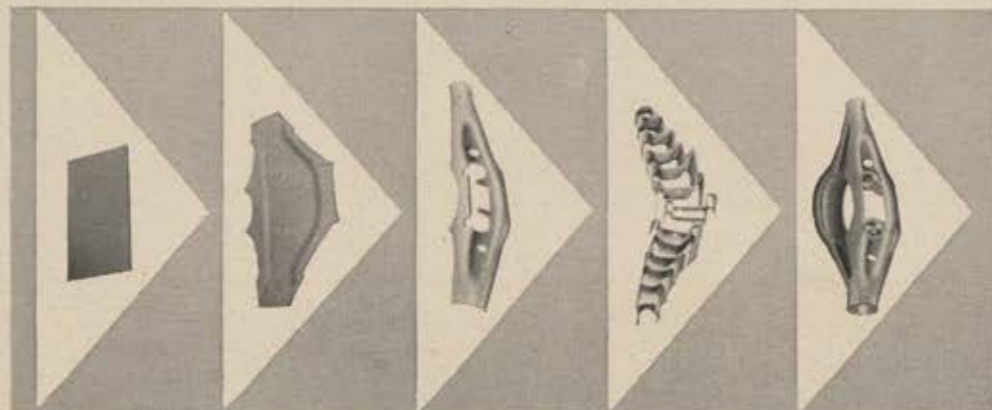
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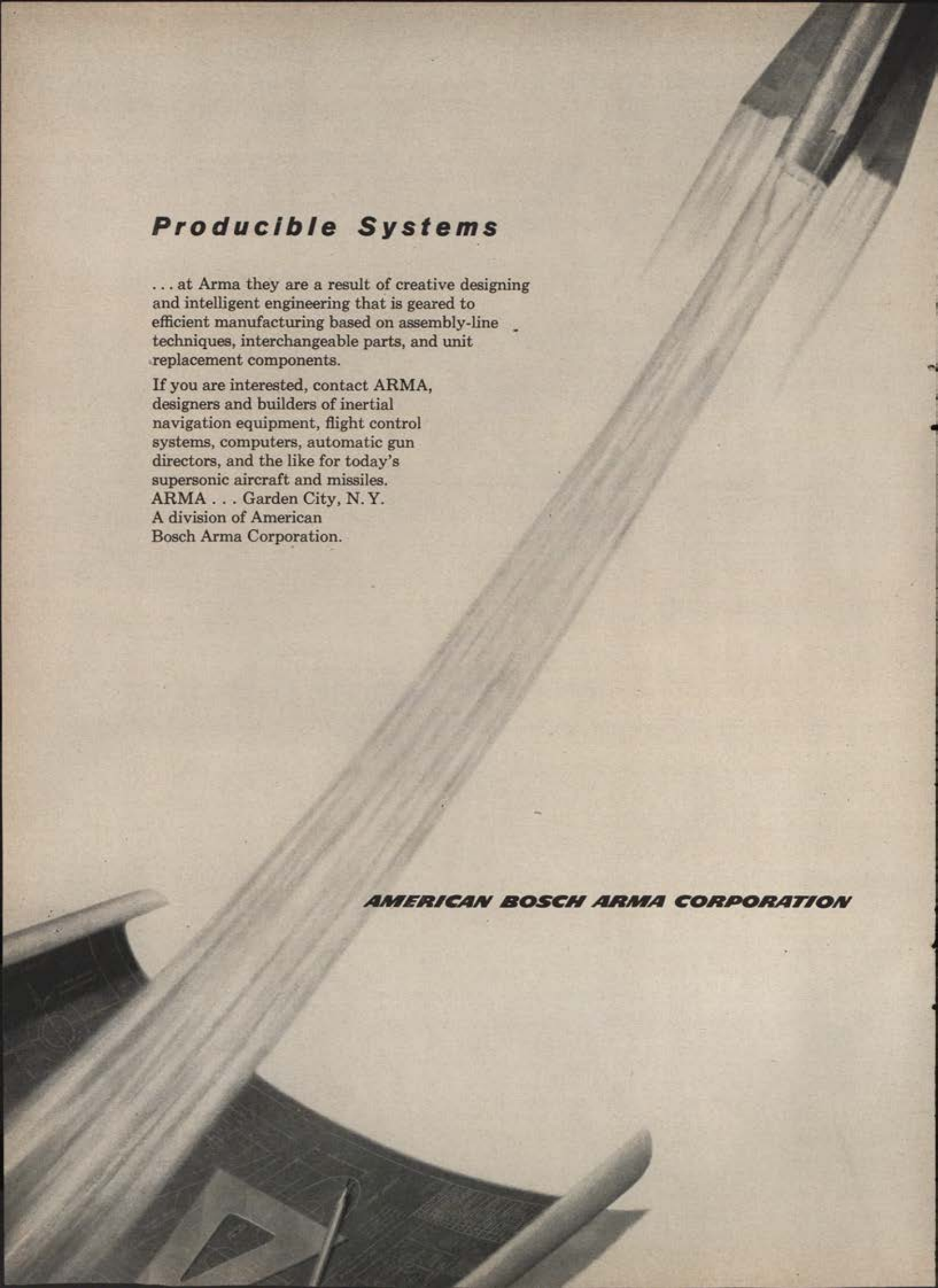
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JET BLASTS ————— CONTINUED

transporting the children is another way the parents can help. This type of work does not take much time, yet it is rewarding and worthwhile.

Scouting is another activity in which adults are desperately needed. Some communities cannot have a scout program, not for lack of children, but because of the lack of adults. These are the words of a Kilby Prison official: "I have never known an inmate who had been a Boy Scout. Show me an Eagle Scout and I will show you a future leader in the community." You need not be a Daniel Boone to be active in scouting. If you do go on one of the overnights with the boys, you will come back tired, but with a deeper understanding of all boys, your own being no exception. However, if you don't like knot-tying or camping, you can be of great assistance in the administrative end of scouting. The need for mothers in the scouting program is also great. As den mothers they play an important role in the Cub Scouts. In the Girl Scout and Brownies programs they are the primary leaders, both in administrative and troop activities.

A visit to your local Chamber of Commerce will open another avenue to your community. Here is a group of men dedicated to the progress of their city. A trip to your Chamber of Commerce is well worth the time and effort. No matter what your interests are they will find something for you to do that will help your community and will give you a feeling of accomplishment and belonging.

Membership in national organizations, lodges, college fraternities, alumni groups, or professional groups can be most helpful to you. A visit or call to the local chapter of your affiliation will give you an opportunity to make new friends in your community. The American Red Cross is another national organization which can help you get acquainted. In many communities they offer courses in Nurses' Aid and Grey Ladies. Hospitals throughout the country are desperately short of nurses and they welcome these volunteers.

Time is a big problem for all of us; however, do not let the lack of it be an excuse. Many important jobs can be done by giving as little as an hour a week. By giving this time you will become a real part of the community. Once the Air Force nomad has achieved this sense of belonging he will make a home in any community, whether it is Spokane, Plattsburg, El Paso, Montgomery, or Caribou.

MAJ. PAUL G. MCARTHUR
Maxwell AFB, Ala.



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The READY ROOM

RESERVE AND AIR GUARD NEWS

A New York stockbroker and the commander of New Jersey's 108th Air National Guard Fighter-Interceptor Wing will head up the Air Force Association's National Air Reserve and Air National Guard Councils for the next year.

AFA President Peter J. Schenk last month named Paul S. Zuckerman to head the Reserve Council and Donald J. Strait to act as chairman of the Air Guard group. In military status, both are brigadier generals.

Named to serve with General Zuckerman on the Reserve Council were:

Brig. Gen. John R. Alison of Hawthorne, Calif.; Col. Joseph T. Benedict of Worcester, Mass.; Brig. Gen. John O. Bradshaw of West Lafayette, Ind.; Brig. Gen. Jerry W.



At an open house conducted by the 8500th Air Reserve Squadron (Navigation Training), Hamilton AFB, Calif., active reservist Capt. Arthur Gutowski shows C-47 radio equipment to his wife and three children, Gale, Gregg, and Glenn.

Davidson of Fort Worth, Tex.; Brig. Gen. Daniel DeBrier of Atlantic City, N. J.; Maj. Gen. T. B. Herndon of Baton Rouge, La.; Col. Ben W. Fridge of San Jose, Calif.; Lt. Col. William P. Gilson of Sacramento, Calif.; Maj. Sanford Swerdlin of Miami, Fla.; Brig. Gen. Ramsay D. Potts, Jr. of Washington, D. C.; and Lt. Col. Frank Ward of Battle Creek, Mich.

Nominated to serve with General Strait on the Air Guard group were:

Lt. Col. Robert D. Campbell of Los Angeles, Calif.; Lt. Col. Roy E. Cooper of Cheyenne, Wyo.; Lt. Col. Staryl C. Austin of Portland Ore.; Col. Bernard M. Davey of Atlanta, Ga.; Capt. John T. Guice of Tucson, Ariz.; Maj. Douglass N. Presley of Dallas, Tex.; Lt. Col. Curtis J. Irwin of Syracuse, N. Y.; Lt. Col. Robert P. Knight of St. Paul, Minn.; Col. Howard T. Markey of Chicago; Brig. Gen. William W. Spruance of Wilmington, Del.; Brig. Gen. Charles W. Sweeney of Boston, Mass.; and Col. Philip E. Tukey, Jr., of Bangor, Me.

General Zuckerman, who has established a national reputation as a leader in reserve affairs, holds a mobilization assignment at First Air Force. He succeeds General Herndon as Reserve Council chairman.

General Strait, one of the leading aces in Europe in World War II, recently returned to New Jersey after serving for two years as Deputy Assistant Secretary of the

Air Force for Reserve and ROTC Affairs. He succeeds Col. Alfred C. Schwab, Jr., of St. Paul, as Guard Council chairman.

The councils consider airpower matters directly affecting the Guard and Reserve and make recommendations to the Association president and board of directors. The two groups will hold their first meeting on November 1 at Colorado Springs, Colo.

Air Force also last month announced the composition of its Air Staff Committees on Air National Guard and Air Reserve Policy. These committees are referred to principally as the Section Five Committees, the designation stemming from Section Five of the National Defense Act, which establishes the groups.

There are, in fact, three committees, each having six regular members and two alternates. One is composed of Air National Guardsmen, another of Air Force Reservists, and the third of Regular Air Force officers. When convened, the three groups merge into a single committee for policy deliberations.

The Air National Guard group is headed by Brig. Gen. G. Robert Dodson of Portland, Ore. Other members are:

Brig. Gen. Allison Maxwell of Indianapolis; Brig. Gen. William W. Spruance of Wilmington, Del.; Col. Bernard M. Davey of Atlanta; Col. James M. Trail of Boise, Idaho; and Col. Philip E. Tukey, Jr., of Bangor, Me. Alternates are Col. John R. Dolny of St. Paul and Col. Frank Bailey of Little Rock.

The Air Force Reserve group is headed by Maj. Gen. John P. Henebry of Chicago, chairman of the board of AFA; Brig. Gen. John H. Foster of San Antonio; Brig. Gen. John O. Bradshaw of West Lafayette, Ind.; Col. Russell Tarvin of Rocky Ford, Colo.; and Col. Roger L. Zeller of Arlington, Va. Alternates are Brig. Gen. Ramsay D. Potts, Jr., Washington, D. C.; and Col. Asa W. Candler of Atlanta.

Chairman of the Regular group is Maj. Gen. Robert B. Landry, former commander of Fourth Air Force and now Assistant Deputy Chief of Staff for Personnel. Other members are:

Maj. Gen. Richard H. Carmichael, director of personnel procurement; Maj. Gen. Joseph J. Nazzaro, director of personnel planning; Maj. Gen. Maurice A. Preston, deputy director of operations; Maj. Gen. Benjamin J. Webster, director of programs; and Brig. Gen. William E. Rentz, deputy director of installations. Alternates are Col. James L. Tarr and Col. Harry R. Page.

The committees will meet this month to discuss policies affecting the Guard and Reserve, including Air Reserve Technician plan, mobilization assignments under the "match-merge" program, and funds for the support of the reserve program.

Notes on the back of a Form 175. . . Increasing numbers of new aircraft entering the ANG program have created a need for accelerated transition training. National Guard Bureau has authorized eight additional training days for tactical pilots in the current fiscal year to help speed the transition program. . . Air Force has allocated sixty spaces to the ANG in the coming year for the jet qualification course. Classes start every two weeks, beginning this month. . . Air University has given the Guard fifteen spaces in the Squadron Officer School at Maxwell AFB. Three classes are scheduled, the next opening on January 6.—EDMUND F. HOGAN

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FICo ASN-6 Present Position Computer System — indicator and control are shown.

No missile systems can be illustrated because of the level of classification. FICo is doing extensive work in ABMA's Redstone and Jupiter programs, in the Navy's Tartar and Terrier programs, and in other projects.



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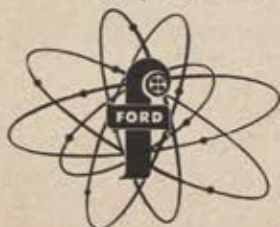
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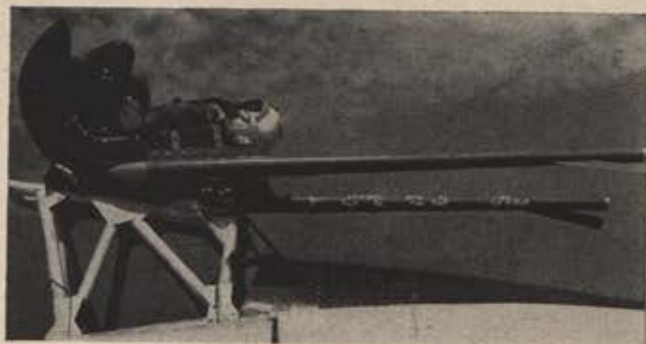
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Tech Talk

By Bob Strobell



Poised on its launching platform atop a supersonic rocket sled at ARDC's sled track at Hurricane Mesa, Utah, the "B" ejection seat (*above*) being developed and tested by the Industry Crew Escape System Committee is positioned for ejection at supersonic speed. The seat projects the dummy feet-first into the windstream. Twin booms that extend almost five feet behind the seat back stabilize its flight. Folding fins at the end of the booms increase the seat's stability on its rocket-propelled trajectory away from the sled. Technicians (*left*) load JATO propulsion bottles into the F-102 rocket sled in preparation for a supersonic test of the new twin-boom ejection seat configuration being developed for Century Series aircraft.

An electronic altimeter, accurate to within forty feet at 60,000 feet altitude, has been developed for the Air Force by the Air Research and Development Command. It will replace electronic altimeters now being used by the Air Force. Designed for navigation, the altimeter also will be useful in aerial reconnaissance, and for other applications where exact altitude is necessary. Test models, manufactured by the Radio Corporation of America, Victor Division, Camden, N. J., have successfully passed a year of flight testing.

The new altimeter works by sending a radar signal to the ground and measuring the time it takes to return. This time then is transposed into feet, and servomechanisms display the altitude on a standard altimeter dial. Present electronic altimeters require an operator to read a cathode ray scope to determine altitude.

The US Air Force Academy has accepted delivery of the first of several sailplanes (*see cut*), a Schweizer 2-22A trainer and a 1-26B high-performance sailplane, at the Schweizer Aircraft Corp., Elmira, N. Y. The sailplanes will be used to introduce cadets to motorless flight at the Academy both as part of the curriculum and as a sport. Soaring began at the Academy last year when a group of officers formed the Falcon Glider Club and purchased a Schweizer 2-22.

The new 1-26B is the latest Schweizer design, especially equipped with oxygen for high-altitude soaring, and includes a two-way radio. It is a single-place sailplane with a forty-foot wingspan practical for soaring under light thermal conditions. The 2-22A is a two-place sailplane intended for dual training or sport flying and can be launched by either auto, winch, or airplane tow.



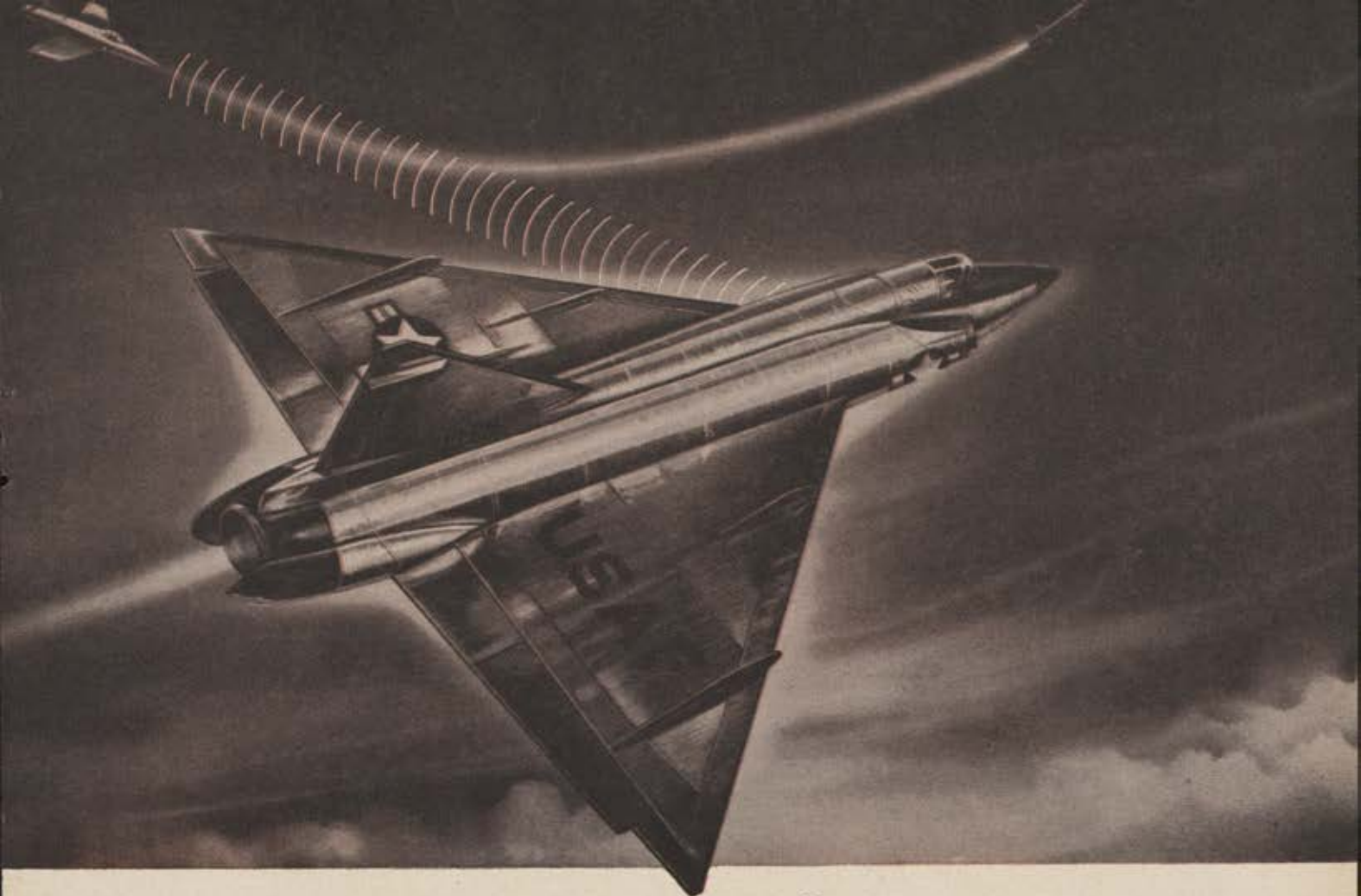
Schweizer 1-26B high-performance sailplane accepted at Elmira, N. Y., by the Air Force Academy for use at the Academy to introduce cadets to soaring flight.

Bell Aircraft Corporation's X-14 jet-powered VTOL has successfully completed initial flight testing. Powered by two British-made Armstrong-Siddeley jet engines, the X-14 flies like a helicopter. It is designed to take off vertically in a conventional horizontal position, shift to forward flight, and land vertically, eliminating the need for a runway. The X-14 differs from the so-called "tail-sitter" VTOL airplanes because it can operate without the help of ground-handling equipment to position it for takeoff.

Thrust diverters or vanes located behind the engines direct the powerful jet blast toward the ground to lift the airplane. For forward flight, the pilot redirects the thrust toward the rear. Because normal control surfaces, such as elevators, rudder, and ailerons, have no effect during hovering and at slow forward speeds, the X-14 has compressed air nozzles at wing tips and tail to provide necessary directional control.

The X-14 has a wingspan of thirty-four feet and a length of twenty-five. It is eight feet tall at the tail. The wings, ailerons, and landing gear are parts of the Beech Bonanza, and the empennage parts are from the Beech Mentor.

The Martin Company has announced that it has developed an airborne cooling system which it says will protect electronic equipment inside air-
(Continued on page 89)



taking the **homing** out of enemy pigeons

In today's concept of modern weapons our defenses must be many, varied and impregnable. Much has been said about our physical resources — our defense aircraft and our guided missiles — but there is another area — the area of counter measure—a defense system that has been kept as quiet as the operation of the equipment itself.

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Close observation of jet or piston engine test performance.



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Observation of danger areas, where exposure would involve danger to personnel.

Brand new! RCA "Telemite" (model JTV-1) a 1-pound ultra-miniature television camera, makes possible direct observation of sites and events never before accessible by TV

It fits lightly into the hand; it can be carried in a pocket; it weighs about a pound; it will go places too small for ordinary cameras, too dangerous for man; it will observe without being conspicuous; it may be mounted on a tripod, fastened to wall or bulkhead, hand-held by a pistol grip. Size: 1 $\frac{3}{8}$ " x 2 $\frac{3}{8}$ " x 4 $\frac{3}{4}$ ".

By means of a transistorized circuit and the new RCA half-inch Vidicon, the "Telemite" actually surpasses

standard Vidicon-type industrial TV cameras in sensitivity. It produces clear, contrasty pictures with a scene illumination of 10-foot candles or less.

The "Telemite" operates with up to 200 feet of cable between it and the control monitor, and this distance can be further extended by using a repeater amplifier. This is the first TV camera to employ photoelectric sensitivity control, which provides automatic adaptation to widely varying scene illumination.



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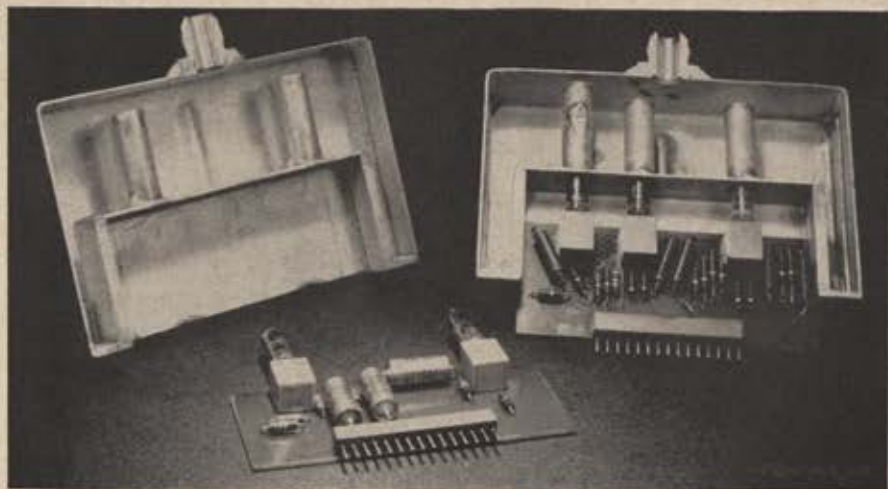
planes or missiles from the 800 degree Fahrenheit temperatures of Mach five flight. The method is based on the high heat absorption quality of water. A can of water is mated mechanically to an electronic chassis. The water is vaporized by the external heat and dumped overboard as steam. Internal heat generated by the electronic equipment is conducted directly into the boiling water.

The results, proved in a year of testing, are essentially constant temperatures for the components despite aerodynamic heating conditions equivalent to those encountered at Mach two to 4.5. While outside temperatures raised from 150 degrees centigrade to 400 degrees, components protected by this system climbed less than ten degrees centigrade. The cooling effect can be maintained indefinitely depending on the amount of water employed. A quarter pint of water will take care of a one-tube amplifier for fifteen minutes at temperatures encountered at Mach 4.5.

The new "Super T-6" (see cut) is hardly recognizable as the famous North American T-6 of the Korean War or the AT-6 of World War II. The Erle L. Bacon Corp., Santa Monica, Calif., recently completed the conversion of the Texan. Performance figures developed in the initial phases of the flight-test program show that the cruising speed is 216 mph TAS at 10,000 feet using sixty-four percent power, as compared to 170 mph for the standard T-6. Rate of climb has been increased to more than 1,750



Republic Aviation's aerial refueling system converts fighters to tankers and back again in minutes. RF-84F Thunderflash (bottom) refuels from a F-84F.



Martin Company's cooling system for electronic equipment uses boiling water to protect components from supersonic aerodynamic heating at Mach five flights.



Bell X-14 (above) uses system of vanes controlling direction of thrust from engines to rise and land vertically while plane maintains horizontal attitude during flight.

"Super T-6" conversion of famed North American T-6 (right) by Bacon Corp. has shorter wings, tricycle landing gear.



fpm, and range is up twenty percent.

The conversion includes retractable tricycle landing gear; modernized power package with the standard R-1340 engine, with pressure cowl and jet stacks; one-piece plastic

canopy; new lightweight Goodyear wheels with spot-type, single-disk brakes; four-foot shorter wing with tip tanks; modernized "jet-type" cockpit and instrumentation; and general airframe "cleanup" for drag end

weight reduction. The "Super T-6" conversion has been developed for production in kit form to enable some thirty-two other countries now actively using the T-6 to modernize their planes.—END

AFA NEWS

SQUADRON OF THE MONTH

The Squadrons of the Illinois Wing, Cited for their achievements in the field of aviation education, particularly for their accomplishment in furnishing a scholarship to a chosen teacher to attend Teacher's Workshops.



Gill Robb Wilson addresses the first meeting of the new Denver Airpower Council. At table, Gwynn Robinson, Rocky Mountain vice president; Palmer Hoyt, Denver Post publisher; and Ted Stell, Denver Squadron Commander, serving as Council secretary. Luncheon was held in June.



Present at the glittering farewell dinner for Gen. Curtis LeMay were, left to right, Nebraska's Gov. Victor E. Anderson, Chairman Arthur C. Storz, Air Force Secretary James H. Douglas, the guest of honor, and Homer Gruenther, Special Assistant to the President and an Omahan.

Honoring Gen. Curtis LeMay as he left SAC to take over as AF Vice Chief of Staff, the Omaha Ak-Sar-Ben Squadron sponsored a packed farewell testimonial dinner at Omaha's Sheraton-Fontenelle Hotel, the scene of the 1954 AFA convention. More than 400, including top figures such as AF Secretary Douglas and other representatives from government and the aircraft industry, were on hand at the fete, which was planned chiefly by Arthur C. Storz, national director of AFA and AFA's 1955 Man of the Year.

With space satellites and flight so much in the news now, the Cleveland, Ohio, Squadron took recent advantage of strong public interest and sponsored a well-attended Outer Space Symposium, featuring a panel of six experts. Heading the speaker list was Earle Gregg, Case Institute professor, who talked on radiation effects today and in the coming age of space flight. Also featured were Capt. R. J. Laws, USMC Reserve (ground support of guided missiles); Dr. I. M. Levitt, Director of Philadelphia's Fels Planetarium (space travel); Col. William H. Bowers, AF Office of Scientific Research (general problems of space flight); Col. Paul Campbell, also of AFOSR (specific problems of aeronautics); Dr. Victor Blanco, Case Institute (astronomy); and Donald R.

Snoke, Thompson Products (space satellites and stations). Squadron Commander Willard Dougherty headed the planning, and moderators included Kenneth Vetter and Maj. Erwin Cooper.

The rejuvenated Phoenix, Ariz., Squadron, now called the Sky Harbor Squadron, is aiming at national leadership with its busy programming pace. An event-filled summer was topped off by a week-long Golden Anniversary tribute in July, with a highlighting dinner attended by more than 1,000 persons, who heard a panel including Maj. Gen. Orval A. Anderson, USAF (Ret.), (Continued on page 93)



Will Dougherty, right, presents Ohio Wing Airpower Award to Charles Tracy, Cleveland Press aviator editor, for his 1957 contributions to aviation.



These teachers attended Miami University Workshop this summer under combined sponsorship of Maryland AFA, industry, and CAP. A. Paul Fonda, Maryland Wing Commander, is in center of group, in uniform. The sponsors assumed all expenses.

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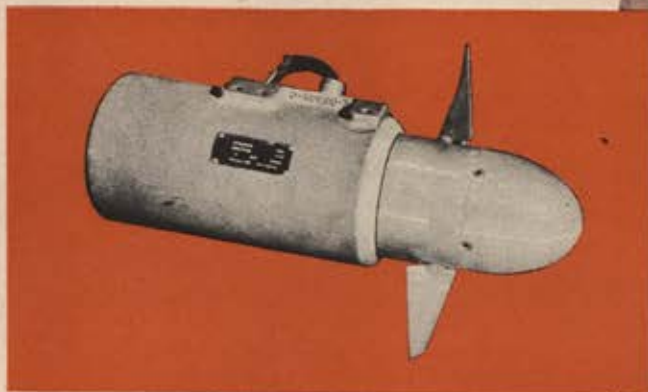
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Feature of the Minneapolis Golden Anniversary celebration was this display of an AF "Golden Jet" installed in a downtown square. AFA sponsored observance.

Executive Director of the Air Force Historical Foundation. Squadron Commander Sam Maxcy was program chairman and enlisted co-sponsorship of Rotary, Kiwanis, and Optimist clubs.

AFA's Twin-City Squadron, serving St. Paul and Minneapolis, held two Golden Anniversary programs during the summer, to provide both communities an opportunity to see airpower in action. Minneapolis' celebration in June was built around the "Golden Jet"—an AF F-80 painted gold, on display in the city—and a followup feature was a conducted tour of the Air Defense Command facilities at the Colorado headquarters for twenty-two leading Minneapolis citizens. Ed Kube, Squadron Commander, headed the program.

St. Paul marked the anniversary in July with an indoor program built around an ice revue carrying out the theme, and attracting more than 7,000. The show also included display of industrial aviation. WAFs served as usherettes, and cosponsor of the program was the St. Paul Trades and Labor Council.

The Oklahoma Wing's anniversary observance, also marking the fiftieth year of Oklahoma's statehood, featured civil and military aviation displays and dedication of the art glass window in the base chapel of Tinker AFB, Oklahoma City. The window's cost had been met by funds contributed by local AFA squadron membership. Heading the program was AFA director Hardin W. Masters, and an additional feature was a luncheon at the Tinker officers' club for more than 200 guests. Guest speaker was Maj. Gen. Charles J. Bondley, Jr., Director of Supply and

Services, Hq. USAF. Native Oklahoman Maj. James R. Risner, AF pilot who on the anniversary of Lindbergh's transatlantic flight duplicated it in a jet F-100, was among the guests.

New York Wing's Hap Arnold Squadron, winner of 1957 President's trophy as AFA's outstanding squadron, already has plans to make next year even more successful. First item on the program is the "Classroom in the Sky," planned for October 11-12 at MacArthur Airport on Long Island, aimed at the high school teachers of Nassau and Suffolk counties. The teachers will be taken for flights and shown demonstrations of the importance of aviation to their communities. An open house afterward will be held at the airport. Other plans of the squadron include a huge Golden Anniversary program on Veterans' Day, November 11.

CROSS COUNTRY. . . The Des
(Continued on following page)



Nick Schwall, left, hands Illinois Wing check to Mrs. J. E. Anderson for Aviation Workshop. Present at ceremony was Dr. K. R. Johnson, NAEC president.



Mrs. Jo Doolittle accepts Honorary Commandership from NYC WAF Squadron's Helen Chingos. New York Commissioner Edward F. Cavanaugh beams.



Mrs. Carl Brinke presents California Wing Auxiliary Achievement Award to Air Harbor unit's Mrs. James F. Czach.



North Bay Squadron cake is cut by Mrs. Lucian Powell, as dinner chairman Elliott Hancock, Tom McCaffrey, and Donald Strait watch with pride in their unit.

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AFA NEWS

CONTINUED



Planning meeting of Harrisburg Anniversary committee kept these Keystoneers busy. Left to right, Maj. Gen. George Acheson, Middletown Air Materiel Area CO, Gov. George Leader, Jack Gross, AFA treasurer, and Steve Yednock, Olmsted Squadron Commander. The program was held at Olmsted AFB, September 20.

Moines, Iowa, Squadron observed the Golden Anniversary with a dinner meeting at which past Board Chairman Gill Robb Wilson spoke. Joel Johnson was chairman, and some 150 attended. . . . The California Wing announces two important dates: November 9, Santa Barbara, for the annual Mid-Year Conference; and April 24-26, Los Angeles, for the 1958 Wing Convention. . . . Colorado holds its Wing Convention at the Broadmoor Hotel, Colorado Springs, again this year—November 2 is the date. AFA's Board of Directors will meet there the same weekend, and will attend the Wing banquet. . . . The Illinois Wing's Flying Minutemen Squadron, composed of Reservists in the 437th Troop Carrier Wing, took their AFA interests along with them on their summer encampment at Bakalar AFB, Ind., and held a regular squadron meeting there. . . . Air Harbor Squadron, Calif., sponsored a benefit program last month and turned

over the proceeds to HOPE, Inc.—Col. Dean Hess's foundation to raise funds for Korean orphans. . . . The Queens Squadron, N. Y., holds its annual anniversary dinner October 26 at the Brass Rail, Idlewild Airport. Gill Robb Wilson will address the dinner. . . . The New Jersey Wing's convention will be held at Asbury Park, October 11-12. Details may be obtained from Ken Hamler, Commander, Overlook Road, Millington, N. J. . . . President Pete Schenk spent a week in Washington in September, and during that time made national committee appointments. They will be announced in the AFA Newsletter. . . . The New York Wing Executive Council met at Mitchel AFB September 12. Dinner followed the business session. Lou Davis, Arnold Squadron Commander, outlined plans for the November anniversary program. Lt. Gen. William E. Hall, new CONAC commander, was introduced to the wing.

—GUS DUDA



Pennsylvania Wing convention guests included regional vice president, Leonard Work; Mrs. Work, Wing Auxiliary president; the Rev. W. H. Anderson; Brig. Gen. Ben Webster, CO, 30th AD; Carl J. Long; Pittsburgh councilman David Olbum; retiring commander Bob Cox; and the new commander, Robert L. Carr.



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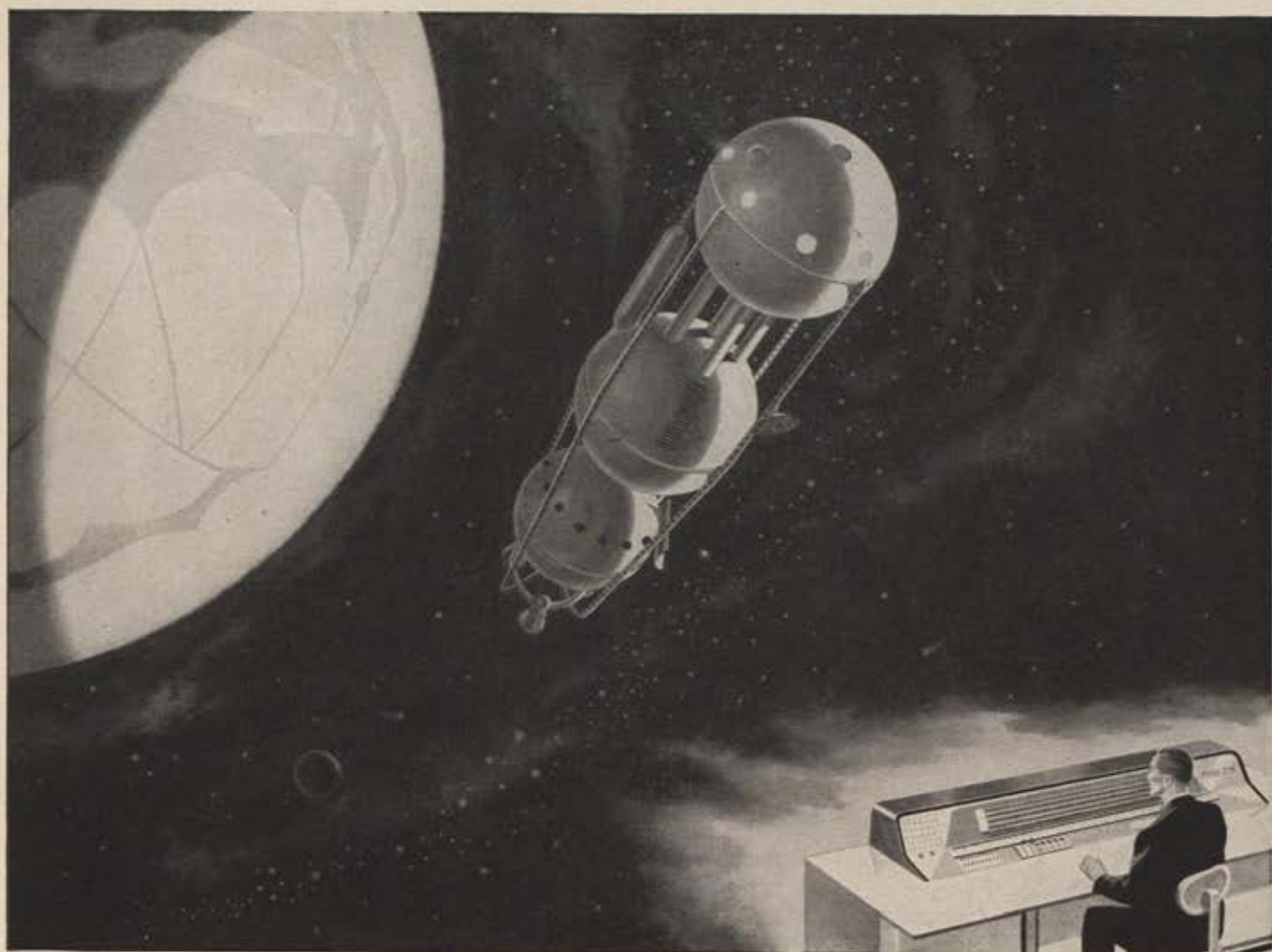
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The signal rocket burst, making a sharp pinpoint of red against the background of dirty, white fog.

LOCKS OF DEATH

By W. F. Tolar

FRED BOX released the brakes and our C-47 rolled forward. At the absolute end of the runway, we turned into wind, lining up with the runway lights. I had no worries. Fred was an excellent pilot. He could taxi a C-47 anywhere, anytime, with perfect control, and never touch anything in the "front office" but his throttles. Without looking, he raised his right hand above his head and snapped on the tailwheel lock. Then he jockeyed the throttles wide open.

The armrest of my seat gave off a steady, increasing vibration, transmitting a message of power from the two Pratt & Whitneys to my elbow. A quick glance at the instrument panel told me everything was functioning properly.

Seconds later, I sat straight up in my seat. We had used three-quarters of the runway, were past the point where even our overloaded aircraft

should have come off the deck. I noticed Fred working frantically with the trim-tab controls. His face was chalk white. Then, I knew we had troubles. I thought of the red notations on our freight manifests, each representing high explosives. But before I could think further, we had bought ourselves some air space and were slowly climbing.

It was a perfectly calm morning. There wasn't a ripple in the C-47 as she continued the climb-out. Fred made a small adjustment with the trim. "Take her for a minute!" I could just hear his voice above the engine noise. He looked sick.

Once I had the control column, I wanted to drop it as you would a hot potato. Twice I tried to move the controls. No luck. I tried the ailerons and rudder, getting the same results. Then the truth hit me like a sledge

(Continued on following page)

hammer. We had taken off with all the control locks still in position on the exterior controls!

At that time, Fred and I were flying with 221 Group Communications Squadron, operating out of Kalembo, in Burma. The Allies were busy pushing opposition south toward Rangoon, retaking Burma as fast as they could advance. With a communications outfit, this sort of advance called for pilots to fly six, eight, and ten hours a day—seven days a week.

On the day before, I had flown into Kalembo after seven hours of flying a Twin Beech, and had found Fred

gets a fair shake. But not this time! I gave Fred an "all clear," after a quick glance out my side window, then relaxed. It was Fred's baby, from then on. Or so I thought! How wrong can you be?

Once in the air, we must have sat looking at one another for a full two minutes, while the aircraft continued to chug through the sky with an indicated rate of climb of about 200 feet per minute. Then we both grabbed the controls and tried everything in the books to loosen them. Still, the craft purred like a kitten, continuing her climb. There wasn't a ripple in the

first turbulent air. Flying on reverse trim was an awkward and confusing movement at first, but we finally worked out a system where Fred handled throttles and elevator, while I worked with aileron and rudder trim. We were fighting to keep the plane on an even keel—fighting for our lives. It wasn't the type of flying you do between Tulsa and Dallas on a clear summer day. It was the kind of flying you do when you've used up all the mistakes you're allowed.

We staggered through the rough spot and continued to climb. Probably the only reason for continuing toward Kalembo, 400 or so miles away, was that our heading during takeoff equaled our course for home. That meant a straight climb-out. Had we attempted to turn and land again at Dum-Dum, we would be pushing up daisies in India today. As it happened, we leveled at 14,000 feet, a safe height over the mountains, and tried to think of some way to get those control locks off.

"Can I get at the locks on the elevators and rudder by chopping through the rear of the fuselage?" one of our mechanics asked. I handed him an axe and said something about "anything being better than nothing," but at that second, we hit a slight bump. Automatically, as my hands had been resting on the control column, I corrected for the slight movement. The elevator responded! A yell from Fred and he grabbed the controls. With elevators, our chances of landing in one piece were improved one hundred percent.

As dawn crawled up from the horizon ahead, I peered anxiously at the wings and saw the large red locks on the ailerons. Until the actual moment that I could see those locks, I had not fully accepted the fact that they were there. But in that first light of dawn, the locks loomed as large as the wings themselves. For the first time, I had the feeling that we would end up, nose first, on the ground 14,000 feet below.

As I looked at the clamp on our right wing, a sudden blur of red flashed backward in the slipstream, and I knew we had lost another lock. Then I was wishing for a parachute, thinking that the men trapped in their submarine, so long ago, must have gone through hell during their final seconds of life. I wondered what it felt like, to have the ground smash you in the face at better than 300 miles an hour. If the old gal should slide off on one wing, I would know.

(Continued on page 101)

ABOUT THE AUTHOR

The plane in this true story was flown by RAF Flight Sgt. Frederick S. Box, while the author, then a pilot officer in the Royal Canadian Air Force, was second pilot on the flight from Calcutta to a wartime field in India. Mr. Tolar joined the RCAF in 1941 and served in England, Burma, and India. After the war he stayed in civil aviation and, more recently, has worked on such construction projects as the DEW Line in the Arctic. Married and the father of four, Mr. Tolar lives in Port Credit, Ontario, Canada. This is his first offering in AIR FORCE.



searching for a second pilot. He had a trip into Calcutta. After one solid month of forward-area jungle flying, a trip to the bright lights looked good. I had only three hours' second-pilot time on C-47s plus one hour of dual, but as the only qualified twin pilot available, I got the flip.

Three hours and twenty minutes later, we touched down at Calcutta's Dum-Dum airport. From then, until our takeoff at four in the morning, we had a great time.

After checking the weather, filing a flight plan and our freight manifests, we caught a truck to the aircraft. Two sleepy mechanics met us at the cargo door. It was a cool morning, without a breath of wind, and held promise of turning out to be a beautiful day. I noticed that the old gal rode very low on her shocks, but let it go at that. Fred and I stood by the tail, yacking with the two mechanics for several minutes, then all four of us climbed aboard. All this on the assumption that our two mechanics had carried out an inspection.

If ever two pilots forgot the entire rule book, it certainly happened with us. We left everything up to the C-47!

Fred dropped into his seat and fumbled with his seat belt, while I made myself comfortable. As a rule, I keep a close eye on first pilots, just to make sure Mrs. Tolar's oldest son

air outside. It felt like we were riding in a slow elevator. I kept waiting for a bump or air pocket, but it never came.

About that time, we started experimenting with the trim-tab controls. The rudder, ailerons, and elevators on a C-47 are large-surface controls. On each of these controls is situated a small secondary control that works in reverse to the movement of the main controls, when operated manually from the cockpit. They are used as boosters, or trims, and take a great deal of physical effort out of controlling an aircraft. With all controls of our aircraft locked in a straight-and-level, or neutral, position, Fred was flying our C-47 on these small secondary controls alone.

"What's wrong?" One of the mechanics had come forward to ask.

"We've taken off with our control locks still in place." I had to marvel at Fred's controlled roar. I hadn't managed to open my mouth.

"Christ! NO!" The expression on his face was one of horror. "And no parachutes!"

I could remember a radio drama of many years before about a submarine crew diving on a shakedown cruise and not being able to surface again. Drama? I suddenly knew how each of those men must have felt.

At the 5,000-foot level, we got our

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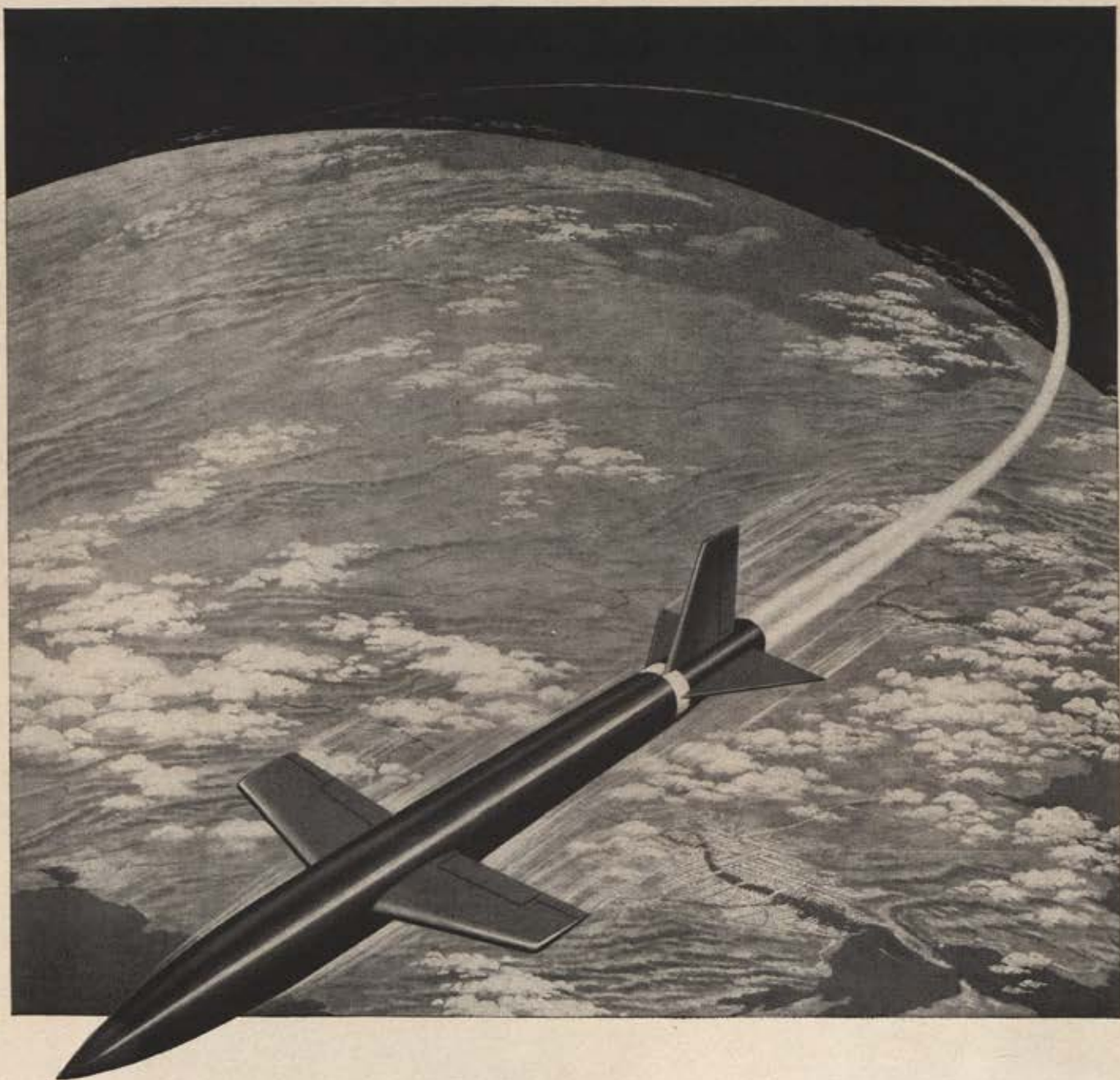
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LOCKS OF DEATH—CONTINUED

Any movement of the right aileron had to be a careful and studied movement, but with one aileron and the elevator free, we were really living! It was a case of combining what control we could manage from the free surfaces with control from our trim tabs and throttles. Complicated? You bet. However, we still had our hopes.

Over the mountains our luck held. There was very little turbulence. We had been in the air for three hours, and in that time, we figured we had learned enough about the controls to get our old babe near the ground.

Above the valley that sheltered Kalemio, we got another cute surprise. Broken but extremely large patches of fog covered the Burmese countryside. I grabbed the radio, hoping against hope that someone would be at a radio in one of the L-5s on the ground—there was no radio control tower at Kalemio. Seconds later, I was yakking at a voice on the ground. Reception was very bad and any talking that he did, I couldn't catch. But I explained the situation and asked for a flare path on the runway.

In the Imphal Valley, some one hundred miles to the north, lay seven thousand feet of the most beautiful concrete runway you've ever seen. Why were we passing that up for the dinky little single dirt strip hacked out of the jungle below us? The answer to that one was fog. When the valley at Kalemio had fog, the Imphal Valley usually had fog. It could hang on until noon. We couldn't.

By easy stages, we let down to 3,000 feet. Our letdown was in very large circles, doing gentle turns. It was the first time we had turned the aircraft since takeoff. We were quite surprised at our new control.

The earphones were still screeching at me, but my reception hadn't improved. I told the voice below to fire a rocket, if he was receiving me and understood the situation. Seconds later, a sharp pinpoint of red, outlined against a background of dirty, white fog, gave me an answer. I instructed the voice to clear all dispersal pens at the end of the landing strip, in case we fell short while grabbing for the ground. I asked for another rocket, if there were indications that the fog was clearing. A burst of red light off to our left was his reply.

At 2,000 feet, we decided that an extra large circuit would put us on the final approach, and I informed the ground that we were committing ourselves to a final. We knew exactly where we were, in relation to the air-
(Continued on following page)



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LOCKS OF DEATH—CONTINUED

field. I asked for a rocket, if the flare path was in position and the end of the strip was clear. I got another burst of red fireworks.

All this time, I had been helping with the trim tabs. Fred was busy with the throttles and control column. Another few hundred feet of altitude would be our point of no return to the clear sky above us. Once below that point, and lining ourselves up with the runway below, it was extremely doubtful we could ever gain enough altitude to clear the mountains a half mile away, should we try to go around the circuit again. Fred pointed down and I nodded. What else could we do?

The fog was going, but so was our gas. We spotted one end of the runway, although fog still covered our approach end. At 900 feet, we could see that there were maybe 200 feet of space between the fog and the ground. On the downwind leg of our circuit, I noticed a slight drift. That meant a final approach with the left wing into wind. That was the wing with the control lock still in place. Anything to make us really sweat it out!

At 500 feet, we started a gentle turn to the left, counting on stretching it out until we were lined up on the runway. Then we got the first patch of broken fog head on. Bit by bit, Fred coaxed the C-47 onto her final path, sweat streaking his face and staining his shirt. The sky would be clear one minute and then change to that murky darkness typical of fog clouds. For what seemed hours, we chugged toward the end of the runway. With 200 feet of breathing space left, flying straight and level, Fred seemed to lower the aircraft by sheer force and determination.

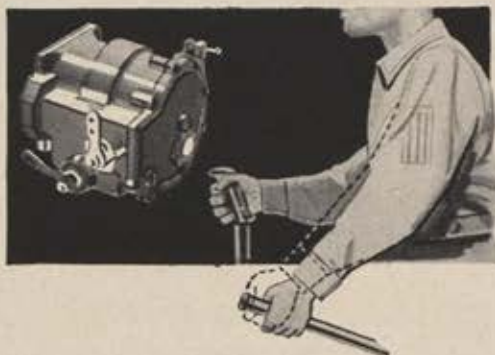
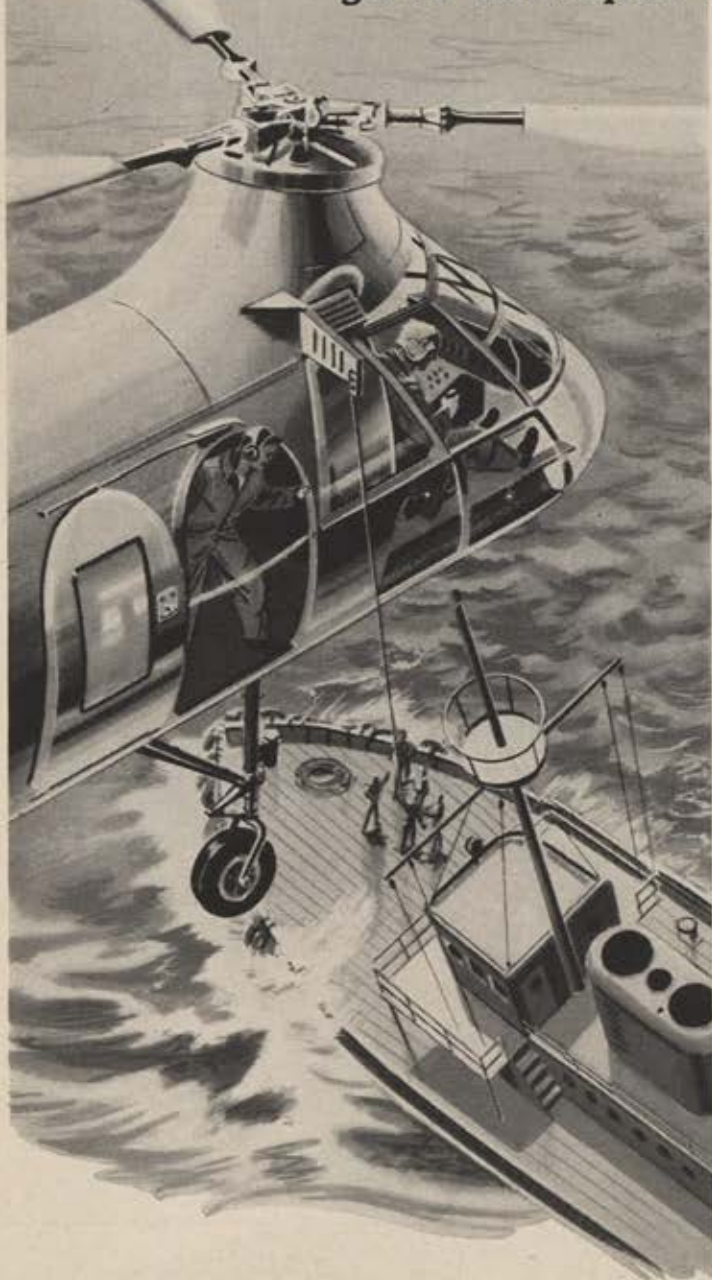
Suddenly, directly ahead and burning brightly, the twin rows of flare pots jumped out at us, their reflection making a weird light on the overhanging patch of fog. We had hit the runway dead center. Fred, flying and praying, now fought the old gal down to the last inch of space. All I could do was grip the armrest of my seat and hang on. If a wing dropped, there wasn't time or space to try picking it up again. If a wing dropped, so did we!

Before I could think further, I felt the wheels touch and we were on the ground. By some superhuman effort, Fred had gotten the plane down! How he had corrected for that bit of crosswind, I'll never know. It actually seemed that for a split second

(Continued on page 105)

The CURTISS-WRIGHT Automatic THROTTLE CONTROL

gives helicopter pilots a "Third Hand"



Many times a helicopter pilot wishes he had three hands . . . one to govern direction, another to control the up, down or hover movement, and a third to regulate the throttle. Now, Curtiss-Wright, in cooperation with the U. S. Army and the U. S. Navy, answers this need for a "third hand" with the all-mechanical Automatic Throttle Control.

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On re-entering the earth's atmosphere, air friction heats the missile causing portions to burn—appearing like a shooting star to ground observers.

Powering the huge X-17 are five solid propellant rocket engines developed and produced by Thiokol Chemical Corporation at the Redstone Division, Huntsville, Ala.

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LOCKS OF DEATH—CONTINUED

before touching down, there had been no locks on the controls at all.

Once the tail dropped onto the ground, it was a cinch to keep the plane rolling straight down the strip. At the end of the runway, we taxied clear and shut off the engines. All four of us climbed out of the aircraft and fell flat on the ground. It felt very good!

Seconds later, a jeep pulled up. The driver and several passengers, once they could see that we were still alive, didn't bother us. We didn't move for another three minutes, satisfied to feel the damp earth beneath us. Meanwhile, quite a few people gathered around our C-47, gawking at the two remaining control locks.

Did we catch hell? That's a silly question. Of course we did. But they also acknowledged the great job that Fred had done. I've never heard of another case where an aircraft has taken off with all control locks in place and then landed with half of them still in place, the crew walking away to tell their tale. On the other hand, I've heard of a number of such takeoffs where the crew didn't live to tell the tale!

True, there were other things we could have done, once we discovered the control locks were in place—like pulling up the wheels and bellying along to a rest among the trees at the end of the strip. But when you are used to operating overloaded aircraft, day after day, when you get used to using three-quarters of the takeoff strip before your aircraft gets into the air, then you've run out of runway before you are sure of trouble. And the explosives in the rear of our C-47 would have added fuel to the fire. Why lower trees at the end of the strip for the next guy?

When we examined the remaining locks on our aircraft, we found that the elastic cables were almost worn through. Another hour in the air and they would have gone like the other two. Constant exposure to pressure created by the slipstream had worn them down.

Three hours after landing, Fred was off again, flying freight into the forward areas. I was flying another C-47, as first pilot, on a mail run. Me and my one hour of dual and seven hours as second pilot! This last trip, I counted as worth 100 hours flying time on any type of aircraft!

And by the way, before I climbed aboard for that mail run, I made sure that the control locks were out! In fact, every time I flew, after that trip, I made VERY sure.—END

Conservative dynamics

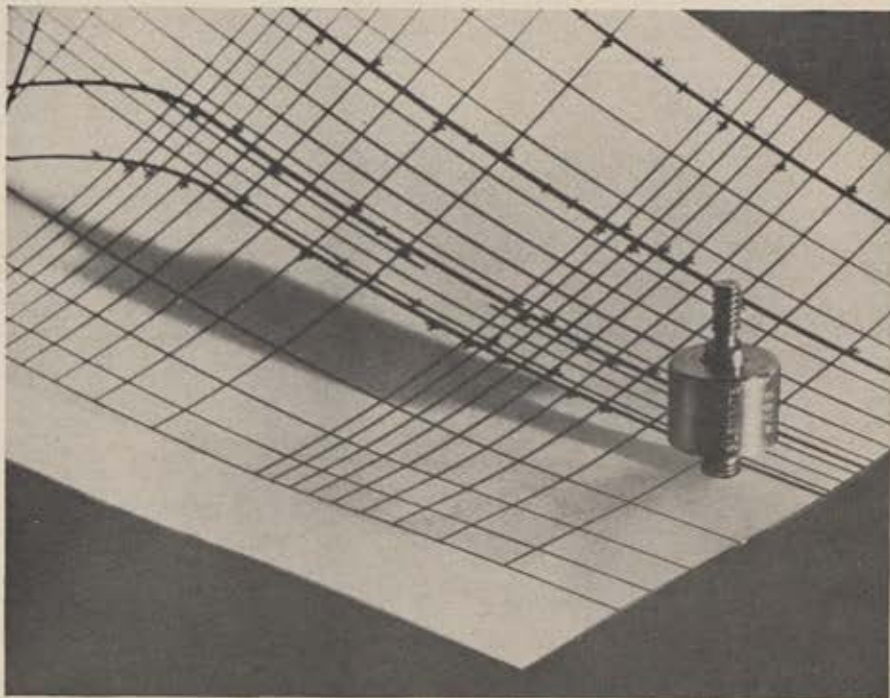
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This particular miniaturized unit had a linearity rating of 10% and was advertised and sold under this specification.

Recently, in a report published by the Bureau of Standards, the accelerometer received a tested linearity rating of 2% . . . a considerable improvement over our own claim.

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• 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 personnel of the United States Air Force.

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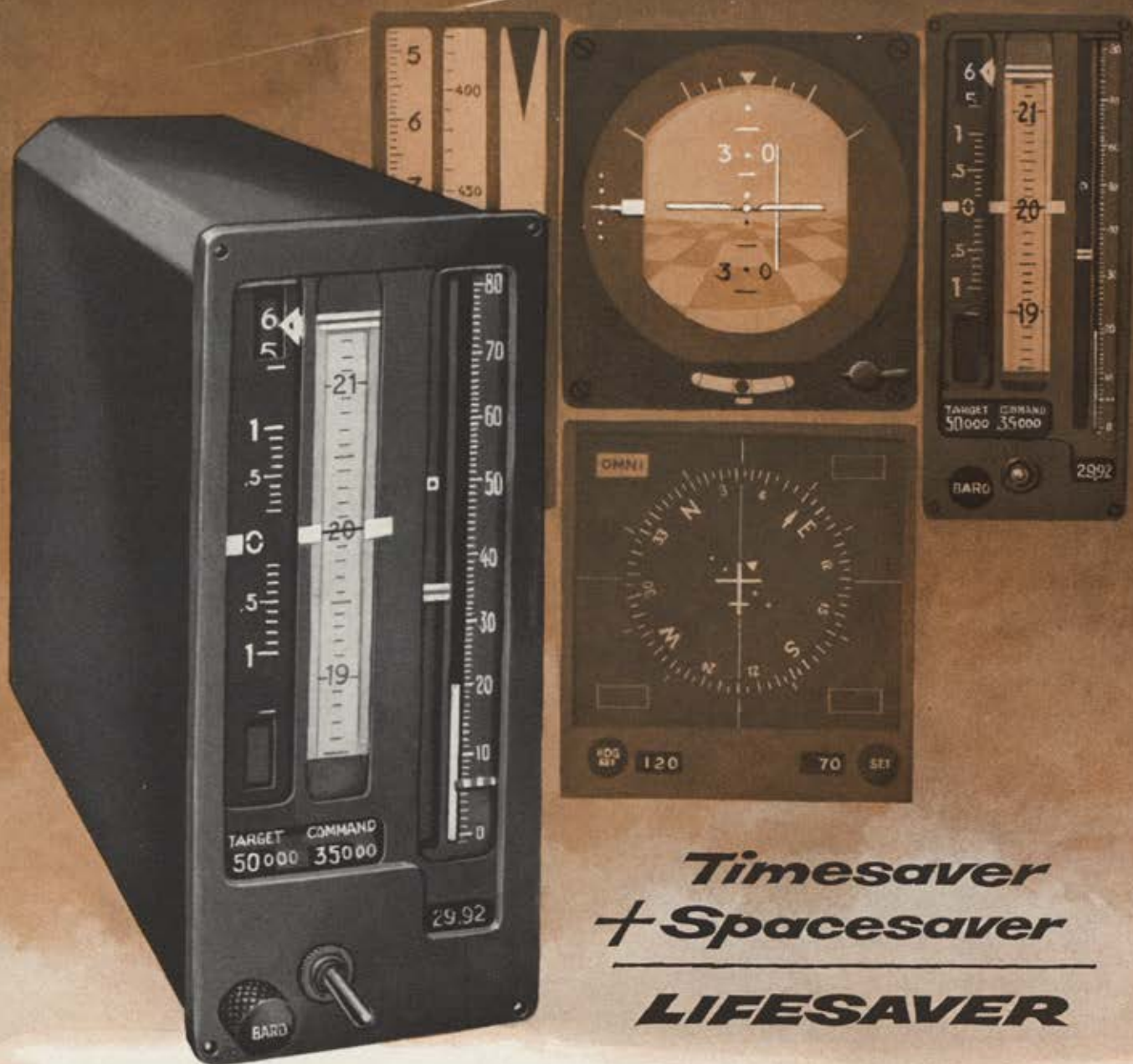
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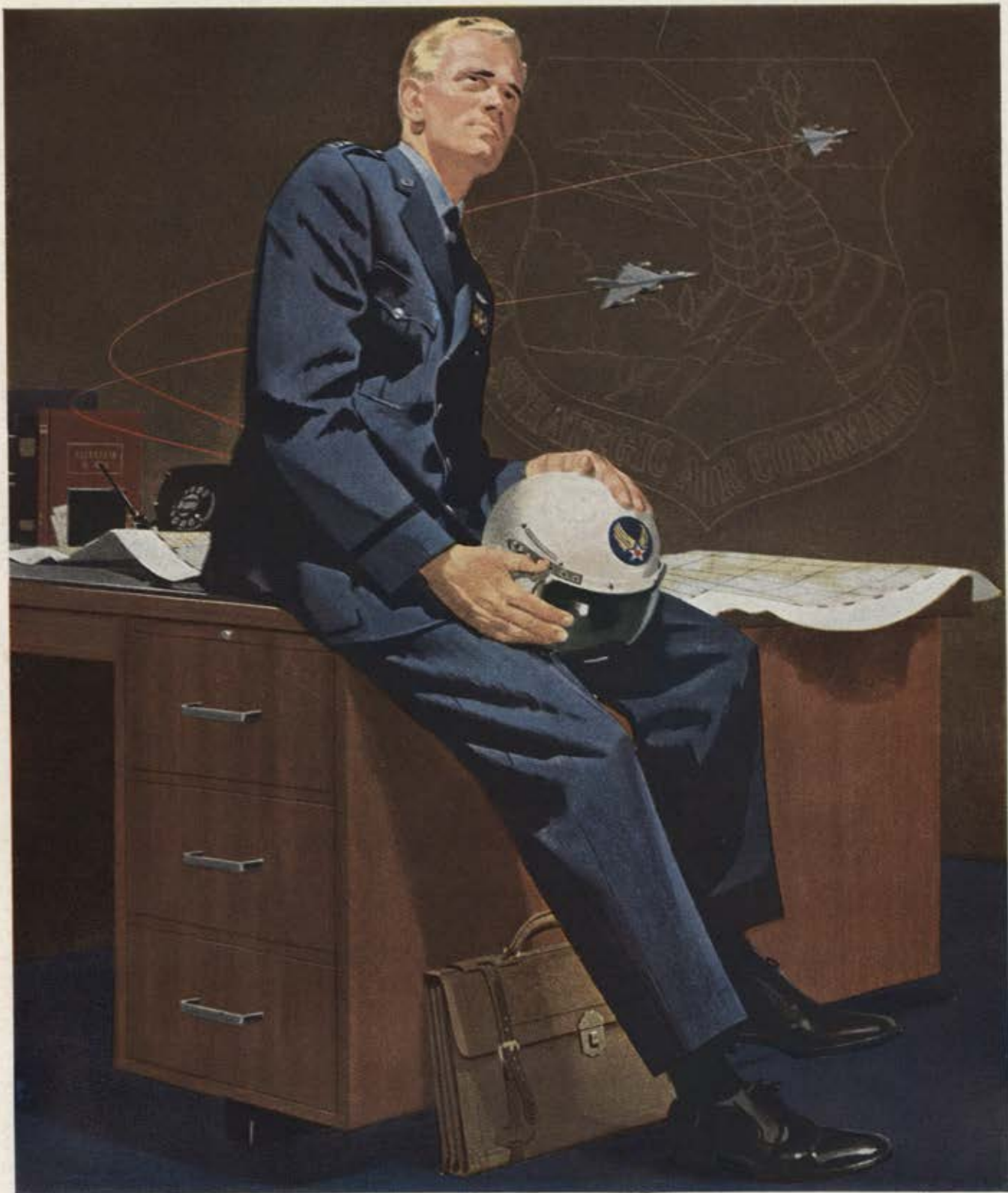
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