AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

June 1955 • 35c

Just a Second, Lieutenant

What Every New Officer Should Know

Are We Abandoning Our Captured Flyers?

Have Parachute . . . Will Travel

Quiz Kids of the Air Force

AIR CONDITIONING systems designed and built by Hamilton Standard are being supplied for such outstanding jet aircraft as the Air Force's Northrop F-89D Scorpion. Years of pioneering aviation experience, the highest engineering skills and unsurpassed modern facilities lie behind these air conditioning systems and other *basic lines** of aeronautical equipment which Hamilton Standard is producing for 38 different types of turbine-powered aircraft.

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Propellers * Starters * Air Conditioning Systems * Fuel Controls * Valves * Pumps

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Above: B-52 bombers on flight line at Boeing Seattle plant

Left: B-52 during a test flight

America's big jet bombers are meeting all schedules

Boeing B-52 global jet bombers are now well into the advanced stages of their flight test program—while production airplanes are coming from the factory on schedule. The airplanes assigned to this continuing test program are averaging nearly twice as many flight hours per month as any previous high-performance aircraft.

This record, in part, is a measure of the success of the B-52 design. It is also a reflection of the huge engineering resources of Boeing's new Flight Test Center—the largest, most complete facility of its kind in the country. This Center enables Boeing to achieve a higher percentage of productive flight test time than was possible before. Programs are planned far ahead, and so organized that on each flight, tests begin the moment the aircraft's wheels leave the ground.

Another part of the B-52's success stems from the earlier experience Boeing gained designing and test-flying the six-jet B-47. The high-altitude frontline B-47 today is the backbone of Strategic Air Command's striking force. It has logged hundreds of thousands of hours of pressurized flight at extreme altitude.

Boeing's experience in this field is unique. For in addition to building more high-altitude, multi-jet aircraft than any other company, Boeing 19 years ago developed the world's first pressurized transport, the Boeing Stratoliner, and the world's first pressurized bomber, the B-29, mighty air weapon of World War II.

Out of this Boeing background grows America's dominant position in the field of pressurized, high-altitude, multi-jet aircraft. It is a position backed by one of the country's largest pools of engineering manpower, by advanced research facilities, and by the Boeing tradition of creating airplanes that open new eras of military and commercial flight.

BOEING

TOMORROW'S AIRCRAFT: *One step closer*

At Air Arm...
flight testing
is FIGHT testing

Air Arm has what it takes to develop and produce the best in airborne electronics equipment. A key factor is the Flight Test facility that puts systems through actual tactical situations . . . a facility that is second to none in the industry.

Far from being a fledgling in this activity, Air Arm's Electronic Flight Test Center is three years matured and still expanding. This unique facility is at the main plant and connected by taxi strip to Baltimore's modern Friendship International Airport. Westinghouse owned and operated, it consists of 48,000 square feet of hangar area, electronic test and administrative sections.

FIGHT Testing airborne systems is the job of Air Arm's Flight Test Center. Here, eight former military pilots, men with aviation backgrounds which total over a century of flying experience, keep as many as 16 prop and jet aircraft on the go. They subject equipment to every possible airborne rigor *before* it goes into operational aircraft. 110 highly trained and experienced Flight Test personnel—engineers, technicians, mechanics, armorers and aerologists are working hand in hand to insure that pilot, aircraft and airborne system form a perfectly matched combination for peak efficiency and performance.

Air Arm Flight Test is one of the many specialized facilities which enable us to produce the best in airborne electronics equipment and . . . to help you bring tomorrow's aircraft . . . One Step Closer. Westinghouse Electric Corporation, Air Arm Division, Friendship International Airport, Baltimore 27, Maryland. J-91030-B

Chief Project Pilots, Tom Lloyd and Fred Hughes, join on the ground, prior to debriefing, following an afternoon air-to-air gunnery check on a fighter armament system.

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- Bomber Defense
- Flight Control
- Missile Guidance
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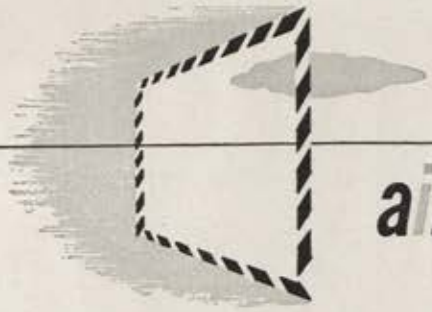

air mail

Civilian Security

Gentlemen: The Federal Civil Defense Administration has reproduced, with the permission of AIR FORCE Magazine, the two articles on Civil Defense [February '55 issue]. One was written by Maj. Ken Blank, USAF, the other by Brig. Gen. Dale O. Smith, USAF.

The Federal Civil Defense Administration distributed these reproductions as part of Public Affairs Bulletin #170 dated 25 February 1955.

The last paragraph on the introduction to Public Affairs #170 stated in part, "Publication of this material is further indication of the seriousness with which the US Air Force—an outfit which should know—takes these key steps," etc.

Before I take issue with portions of Major Blank's article, I want to assure you that we think there is much to be gained by reading such articles and on the whole these two articles are very well done. Nevertheless, there are, in our opinion, statements which are in error and should be brought to your attention.

In the fourth paragraph of Major Blank's article, as reproduced, there is a description of some type of warning. Both the United States and Canada use only two signals on the sirens to denote specific actions to be taken in Civil Defense. The paragraph in question states that there were three one-minute wails on sirens separated by silent periods. The signal was designated as "Air Alert." In the interests of uniformity, and also in the interest of easy comprehension, we feel that the standard siren signals should be used.

The second item in question in Major Blank's article states: "Closing the gas main shut-off valve and pulling the electrical fuse blocks is part of the routine to prevent fire or secondary explosions." The recommendations of the National Association of Gas Producers and Suppliers are not to shut off the main valve but only to shut down the service at the thermostat so that the pilot light will remain burning. Various power companies have recommended that no main fuse blocks be pulled but that electrical appliances should be shut off instead.

There is also a statement: "Each family is briefed on weather, with particular emphasis on the direction of the wind. They know how to avoid the downwind areas from the atomic blast since radioactive fall-out from the atomic cloud creates a new danger." We feel that this may leave a false impression of security to the average citizen due to the fact that no weather briefing would be correct unless it was given immediately after a bomb was exploded. In the event of a warning being sounded, we do not believe that anyone would wait for a weather briefing before evacuating.

Again I want to reiterate, we believe that both articles were very good and much will be gained by the general public reading such well written articles.

Kenneth Pinnon, PIO
Disaster Relief and Civil Defense
Portland, Ore.

NCO Academy

Gentlemen: The forthright story of the Strategic Air Command's Second Air Force Non-Commissioned Officer Academy, written by M/Sgt. Frank J. Clifford, in your April issue, is a fine bit of journalism. He covered the major aspects of our Academy program in a professional manner. We regard the wearers of the Blue Loop as the finest non-commissioned leaders in the Air Force, and, I am glad to say, it is a growing fraternity.

Please express to Sergeant Clifford our appreciation for this excellent report.

Brig. Gen. R. M. Montgomery
Chief of Staff, SAC
Offutt AFB, Nebr.

Gentlemen: The story covering the SAC Second Air Force NCO Academy was of special interest to me since it was written by a "disinterested" party. M/Sgt. Frank J. Clifford has done a fine job in presenting all aspects of our academy program in an honest and interesting manner.

Although Sergeant Clifford mentioned the other SAC NCO schools, I would like to point out that we have central control of the curriculum and operating procedures so that we achieve standardization. We refer to a particular school as THE SAC NCO ACADEMY, Second Air Force Branch, Fifteenth Air Force Branch, etc.

Another point which I believe needs clarification is our selection of NCOs to attend the Academy. Only the very top NCOs are enrolled as students. At the present time they are mainly master sergeants, but the other NCOs will participate after all the top master sergeant supervisors have attended. The wearers of the blue epaulet loop in SAC are members of a fraternity of SAC's finest non-commissioned leaders.

I congratulate you and your staff on presenting such straightforward articles which are of key importance to our maturing Air Force.

Col. Stephen D. McElroy
Director of Personnel, SAC
Offutt AFB, Nebr.

Words of Praise

Gentlemen: Ed Mack Miller's story, "Seventy-Nine Hours" (May '55), was a first-rate piece of writing. Every issue of AIR FORCE should contain a similar story about our peacetime Regulars who brave the hazards to keep our defenses strong. Too often stories like "Seventy-Nine Hours" are given a small blurb in the daily newspapers and we never learn the identity of the intrepid fly guys who have been trapped by the fickle finger of fate, or their rescuers. Recognition of indi-

(Continued on page 7)

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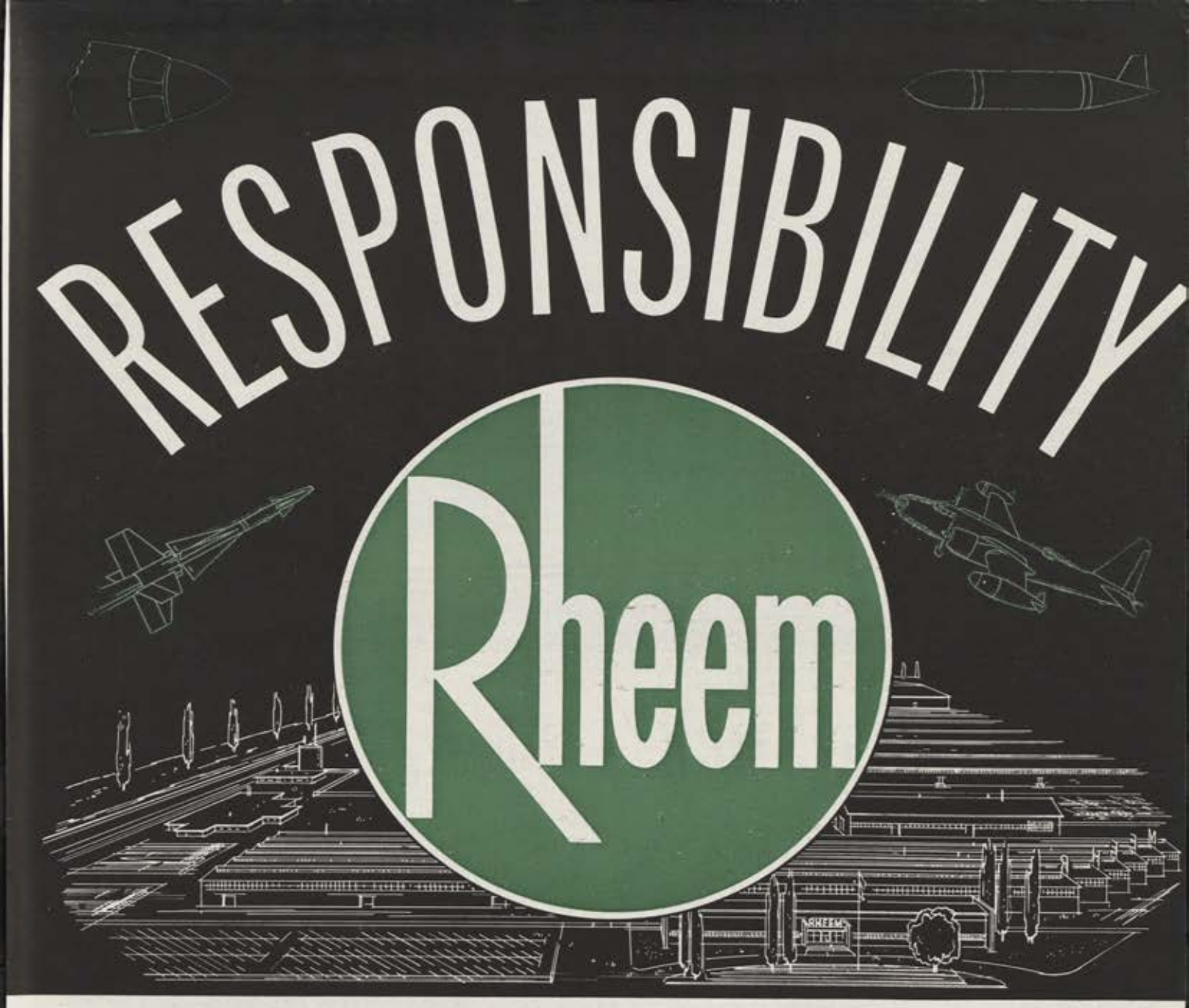

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"Big Stick" . . . jet age version

TEMCO HELPS BOEING BUILD B-52 "RETALIATION" FLEET

Thunder of the Stratofort's eight jet engines is heard clearly at conference tables today, for this sleek giant can, by refueling in flight, strike with an H-bomb load at any point on earth. The threat of this fearful retaliation is impossible for an aggressor to ignore. The Air Force has ordered a fleet of these planes and they will have performed their mission to perfection if they never have to drop a bomb in combat.

Producing planes fine enough to preserve the peace is an awesome responsibility for our aircraft industry. Boeing-Wichita, in starting second source production, called confidently upon TEMCO to produce a major component of the vital B-52, for previous Boeing subcontracts on the B-47 Stratojet had firmly established TEMCO's reputation for producing a quality product, on schedule, at the lowest possible cost.

Tooling up for the B-52 job, these TEMCO workers are building the huge jigs in which major fuselage sections will be fabricated.

ENGINEERS . . . If you are interested in a position with a *growing weapon systems organization*, write full particulars to E. J. Horton, Jr., Engineering Personnel, TEMCO Aircraft Corporation, P. O. Box 6191, Dallas 2, Texas.

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viduals and tactical units for deeds of bravery in line of duty is a fine way of building *esprit de corps* in the finest fighting outfit in the world.

The close cooperation between USAF and RCAF rescue units deserves a few words of praise. My Bancroft Flighter is doffed to Lt. Col. William L. Gibson, 44th ARS, and Squadron Leader Jack Hudson, 111th CRS RCAF, who were most instrumental in effecting the rescue. And bouquets to that angel of mercy, Nursing Sister MacDonald, who had the fortitude to parachute down to our injured flyers in the northern wasteland. How long has the RCAF been dropping Tender Loving Care via the nylon? It's no wonder the RCAF isn't having recruiting troubles with that kind of treatment!

More of the same, gentlemen. You're making AIR FORCE live in the wild blue yonder once again!

Maj. David F. McCallister
Del. ANG
Folsom, Penna.

One More Weapon

Gentlemen: I am a military man on active duty. Naturally I am constantly looking for any weakness in our potential enemy. Even a shooting war could not have a more disastrous end than the present engulfing war which, over the past thirty-seven years, has drawn almost half the world's people behind the Iron Curtain of godless Communism. If our children and the children of the world are to remain free, the Communist onslaught must be halted.

The rejection of God by the leaders of the Kremlin is built on atheistic Marxism. This is their greatest weakness and our greatest strength; a strength as yet unused, a strength that can and should be built into a spiritual dam against the spreading tide of engulfment.

I attended the first National Conference of the Spiritual Foundation of American Democracy. To me, as a layman, these meetings proved that a real united effort by all that have spiritual belief can in the end defeat the stated aims of Communism.

The clergymen who have given their lives to bringing man closer to God are qualified by life-long training to develop this effective weapon against atheistic Communism. It is not necessary to become a member of the foundation unless you so desire. A contribution from you or your organization will substantially strengthen the structure of the dam against Communism that these fine men are now building. The Foundation for Religious Action is at 1346 Connecticut Ave., N. W., Washington, D. C.

Col. A. C. McKinley
Washington, D. C.

Permission Requested

Gentlemen: This headquarters is responsible for the conduct and operation of the Air Force ROTC Program in more than two hundred American colleges and universities. This program is designed to prepare the prospective college graduate for duty as a commissioned officer in the USAF.

Our staff is presently engaged in the preparation of the manuscript for a work to be published for defense purposes as an AF-ROTC Cadet Handbook for a course entitled "Principles of Leadership and Management."

Permission is requested to include in the above-identified work the following material, to wit: "How a Non-Com Sizes Up His Officers," by M/Sgt. Norman Winfield, AIR FORCE Magazine, March 1954 issue.

Col. Henry Dittman
Chief of Staff
Air University
Hq, AF-ROTC
Montgomery, Ala.

Permission granted.—The Editors.

(Continued on following page)

AIR MAIL——CONTINUED

One of the Troupe

Gentlemen: I am writing you regarding the article which ran in the March '55 edition of AIR FORCE Magazine, about the Third Air Force's I&E show in England.

The article, entitled "On Target," is of great interest to me—for I have been connected with the unit since its beginning and would like to thank you for myself and the others mentioned in the article. Much, of course, has been left unsaid and many of the things said perhaps would have been better unsaid. But then everything can't be told and what has been covers the unit well.

George M. Lehr
Middlesex, England

Where Credit is Due

Gentlemen: In reference to your article "School for Zebras" in the April issue, the author, M/Sgt. Frank Clifford, is in error.

The Strategic Air Command *did not* pioneer the NCO Academy idea. The credit should go to the late Gen. John K. Cannon and to Maj. Gen. Charles F. Born, who initiated an Air Force NCO Academy in Weisbaden, Germany, in *1950*.

In proof of the above, I enclose a certified true copy of orders assigning me to the faculty.

Maj. Lawrence Thornton Butterfield
Fort Worth, Tex.

Attack Alarm Inventor

Gentlemen: Our local newspaper recently carried an article entitled "Common-Sense Steps Against the H-Attack." It was taken from the February '55 issue of your magazine.

I would like to have about ten copies to give to my salesmen, if you would mail them to me C.O.D.

The article was written by Maj. Kenneth Blank, USAF, outlining the steps being taken by service families at those bases which are likely first-priority targets.

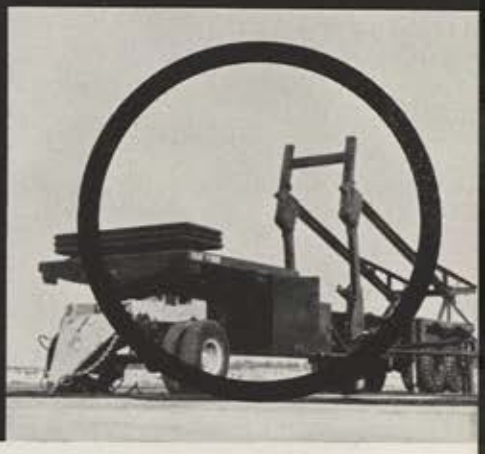
Alfred B. Stranberg
Radio Controlled Enemy Attack Alarm
So. San Gabriel, Calif.

Reprint

Gentlemen: We have reprinted Lee Klein's article entitled "What's a Sonic Boom?" [January '55] in the March 1955 issue of our company magazine. We had many favorable comments on this article and wish to thank you for granting us permission to reprint it.

E. H. Numrich
Western Adjustment and Inspection Company
Chicago, Ill.

tic 'tac' toe!



In the event of surprise attack, today's new and more powerful USAF Tactical Air Command can now carry war to the enemy anywhere in the world—around the clock and in any weather.

Here at a glance are some of the elements that might be used in such an attack and which are contributing to Tac Air's new mobility and striking power.

In modern warfare, major fixed bases are certain to become targets for initial enemy action. The Martin zero-length launcher makes possible swift mobility and advance-area operation of the TM-61 Matador tactical missile and—if need be—of piloted jet fighters.

In addition, new versions of U.S. Air Force's B-57 bomber, a major tactical weapon, are now being developed for service.

And for tomorrow's Tactical Air Command arsenal, new and more powerful Martin weapons systems are on the way.

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TACAN is the result of a series of development programs sponsored by the U. S. Navy and the U. S. Air Force at Federal Telecommunication Laboratories, a division of IT&T. It is another of the outstanding IT&T research and engineering "firsts," and major contributions to safer, more dependable flying.

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AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

Volume 38, No. 6 • June 1955

FEATURES

DEPARTMENTS

THE COVER

The AF-ROTC cadets lined up for a familiarization flight are typical of the 10,200 cadets who will become new AF officers in the current year. M/Sgt. Frank Clifford, an ROTC instructor at the University of Pennsylvania, says most of them have been briefed to make the transition from "campus to camp" gracefully. However, because he feels there may still be some unanswered questions, his advice to new second lieutenants begins on page 90.

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wing tips

By Wilfred Owen

The number of take-offs and landings at Chicago's Midway Airport last year made it the nation's busiest airport. Los Angeles was in second place, followed by Miami and Honolulu. Other cities among the big ten in total civil and military aircraft operations were New York's LaGuardia, Denver, Cleveland, Dallas, Atlanta, and Louisville.

° ° °

Excluding purely local flights, Chicago still had the most traffic, with LaGuardia in second place, Washington, D. C., third, and Los Angeles fourth. Next in order were Dallas, San Francisco, Cleveland, Miami, St. Louis, and Atlanta.

° ° °

More than 600,000 air travelers use charge accounts when they purchase airline transportation. A world-wide credit plan, with seventy-seven airlines participating, provides airline users with credit cards honored by practically all the world's airlines.

° ° °

Colonial Airlines has operated since 1930 without any accident involving a fatality or serious injury to either passenger or employee.

° ° °

A Tennessee Air Guardsman, Lt. Harry Scott, is still talking about his uninvited passenger. He'd taken off for

a cross-country and had reached 1,500 feet when a snake poked its head out of his instrument panel. After Scott's hasty landing, ground crewmen had to remove the instrument panel to get at the forty-two-inch chicken snake.

° ° °

International airlines operating out of fifty countries provide a global transport system serving 3,500 cities. Traffic volume is currently at the rate of 60,000,000 passengers a year.

° ° °

The Civil Aeronautics Administration forecasts that in ten years there will be 286 daily helicopter movements and 1,500,000 passengers per year between New York and Washington alone.

° ° °

The helicopter recently hung up two new records. In the Antarctic it helped spot the largest whaling catch in eighteen years, and in Canada it completed a surveying job in twenty hours that would normally have taken five years.

STRATOS

AIR-CONDITIONS THE NEWEST USAF BOMBER

THE EIGHT-JET BOEING B-52

The Boeing B-52 jet bomber entering operational service with the Strategic Air Command this spring becomes the world's first heavy jet bomber to go into service.

Joining its medium jet bomber teammate in SAC—the Boeing B-47—the B-52 "Stratofortress" greatly strengthens America's Air Arm. A high flying, high speed heavyweight with a range longer than that of any other operational jet aircraft, it is destined to be the backbone of SAC's striking force for some time to come.

To cool the crew and the tons of intricate equipment aboard the B-52, Boeing picked a highly efficient cooling system designed and produced by Stratos.

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STRATOS

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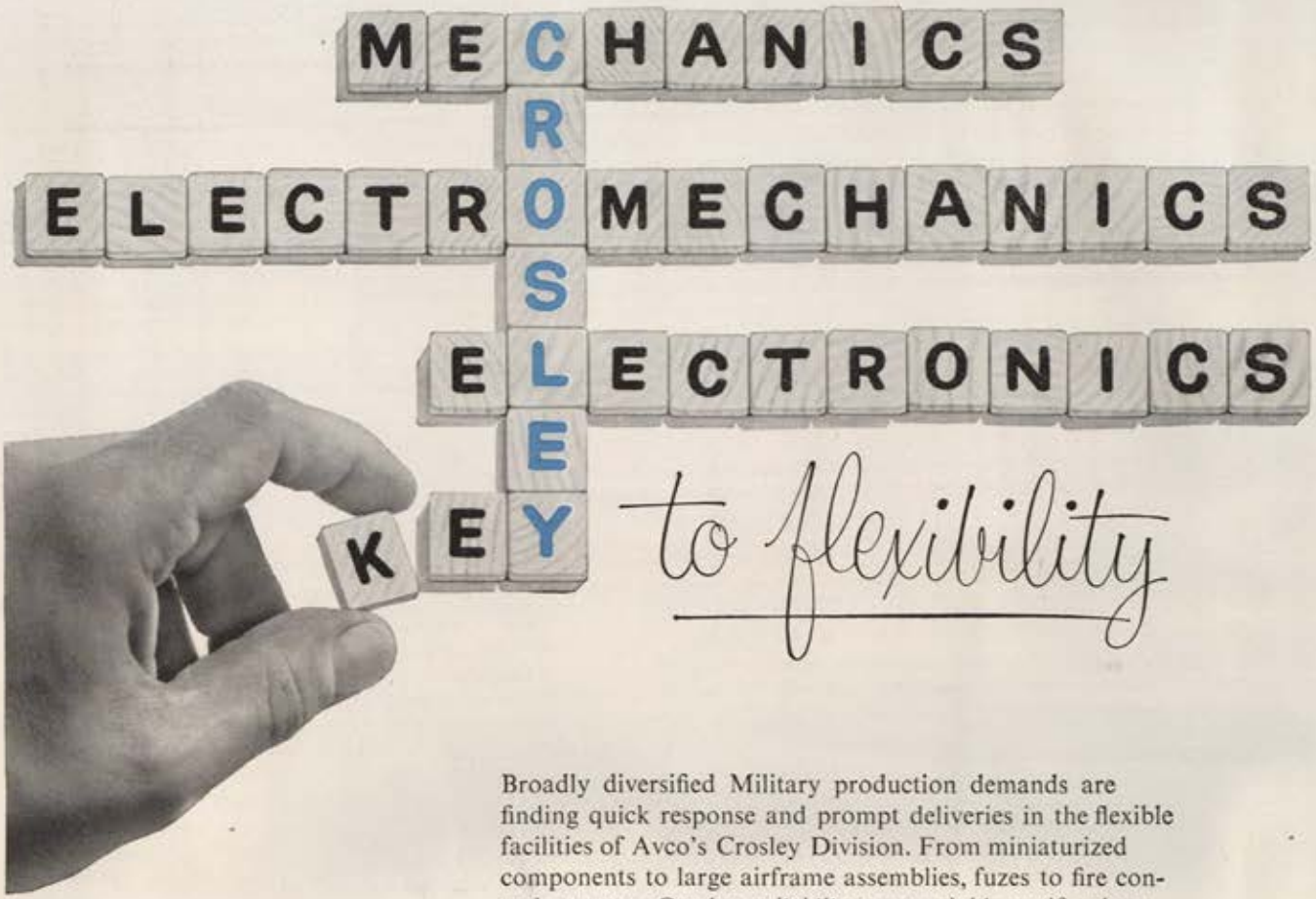

Broadly diversified Military production demands are finding quick response and prompt deliveries in the flexible facilities of Avco's Crosley Division. From miniaturized components to large airframe assemblies, fuzes to fire control systems, Crosley *reliability* meets rigid specifications for "rightness."

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AIRPOWER IN THE NEWS

■ In a speech before the recent **American Helicopter Society** meeting in Washington, **CAA Administrator Frederick B. Lee** predicted that "in ten years, there will be **286 daily helicopter movements** between New York and Washington alone, with close to 1,500,000 passengers a year traveling to points on this route." He also said that a travel market of **133,000,000 persons** making intercity trips of 150 to 700 miles are potential helicopter passengers.

Today, however, there are only **300 commercial helicopters** operating in the US. One big reason—the military services account for ninety percent of helicopter production. In a copyrighted article, *Time* Magazine said the lag in commercial use was due largely to **"the lack of a clear policy** on the part of the US government and the airlines."

In London, **Dr. Igor Sikorsky,** helicopter pioneer, told a meeting of **The Institution of Mechanical Engineers** that

James H. Doolittle, center, and some of the men who were with him on the famous raid on Tokyo in 1942, are interviewed for TV and newsreels in Los Angeles. The Raiders were together for their thirteenth anniversary reunion.

there is "a bright and interesting future ahead for the helicopter." He said that **development** of the transport helicopter **would follow two lines.** Passenger models, according to Sikorsky, will resemble present airliners, but the **freight-cargo types will be quite different** from present cargo carrying planes. "The cargo helicopter may virtually have **no fuselage** body as we know it and may simply represent a flying frame or possibly have a needle-like fuselage or small cross-section adequate to accommodate the transmission and other accessories, and either **a hoist** or other arrangement **to lift the loads,"** he said. As for the power most likely to be used, Dr. Sikorsky predicted a long life for piston engines or turbines combined with the present metal gear transmission. In commenting on the **use of nuclear power** in helicopters, Sikorsky described a unique method of **separating passengers and crew from the reactor.** He suggested that the reactor, together with turbines, be carried in a unit directly geared to the rotors, while the passengers and crew would be **in a separate cabin suspended under the helicopter** on a cable a couple of hundred feet long. The engines would be **operated by remote control** from the cabin, and the radioactive unit would always be separated from the passengers and would even be landed some distance away.

■ **James H. Doolittle,** famed leader of the "Tokyo Raiders" and one of the Directors and founders of the **Air Force Association,** has been selected to receive the 1954 *Federation Aeronautique Internationale* Gold Medal. Presentation of the award—for personal contributions to aviation progress and development—will be made in Paris on June 23. **Previous US winners** of the award have been **Charles A. Lindbergh,** 1927; **Wiley Post,** 1933; **Igor I. Sikorsky,** 1946;

Shown at a Baltimore ceremony after ARDC had received an "Award of Honor" from the National Safety Council are: Lt. Gen. Thomas S. Power, Cmdr. of ARDC; Carl M. Holland; Col. Neal E. Guy; and Will L. Tubbs, NSD Director.

Maj. Charles E. Yeager, 1948; **Dr. Edward P. Warner,** 1951; and **Miss Jacqueline Cochran,** 1953.

■ In Los Angeles for the thirteenth anniversary reunion of his **Tokyo Raiders,** General Doolittle was on the giving end when he awarded a **Safety Trophy to the USAF** for its achievements during the past several years **in reducing vehicular accidents.** The award is to be given annually by Doolittle's Tokyo Raiders.

■ The **Air Force appears determined** to go ahead with its proposal **to move the Air Research and Development Command from Baltimore to Dayton,** in spite of strong opposition from Maryland Congressmen. Backed up in its decision by Ohio's delegation, the AF is **asking for a public works appropriation** for new construction required at Dayton.

■ **Gen. Benjamin W. Chidlaw,** who retired as Commander of ADC and the Continental ADC on May 31, told a **House Appropriations Committee** early in May that our Air Defense must be "well **in excess of ninety percent kill** effectiveness." The general was hesitant about estimating our **present defense capabilities** but did say that, under ideal conditions and with ample warning time, "I would like to think we could destroy them all." When asked by one of the Congressmen about the number of H-bombs we could absorb and still mobilize, General Chidlaw answered: "Frankly, we do not have that answer." He pointed out to the Committee that it was difficult to estimate defense capabilities because of **such variables as weather, speed, and altitude** of attacking planes, and the number of routes used by the enemy.

■ On June 9, about **thirty-five women pilots** are expected to take off from **Washington National Airport** for **Havana, Cuba,** in the first international, over-water air race for women. Sponsored by **The Ninety-Nines, Inc.,** an international association of women flyers founded in 1921 with ninety-nine charter members, the handicap race is **open to lightplanes up to 350-hp.** A purse of $2,000 will be awarded to the winners and all of the women pilots will be guests of the Cuban government for three days.

■ Sometime this summer, the US will begin training selected crews of the **Royal Air Force in the ways of atomic bombing, navigation, and other techniques.** This marks the first time the US has included an ally in plans for potential use of American atomic weapons. In the past, all American

(Continued on following page)

nuclear weapons stored in Europe have been **intended only for American use** in case of war. It will still require a direct **order from the US President** to actually turn over any of the weapons to an ally.

■ On May 10, **eight USAF F-86 Sabrejets** on a patrol mission over the Yellow Sea off the west coast of North Korea **were attacked by twelve to sixteen Communist MIG-15s.** During the brief battle that followed, two of the MIGs were shot down, one was hit and probably destroyed and a fourth badly damaged. Following the attack, the **State Department** instructed **Gen. Maxwell D. Taylor,** commander-in-chief of United States Forces in the Far East "to protest strongly to the Military Armistice Commission," at Panmunjom, Korea, for the "unwarranted and illegal attack." Shortly after the incident, Peiping Radio declared that the Sabrejets had violated Chinese territory.

Among the first flyers to penetrate an atomic cloud—from left: Lt. Col. Carl E. Trexler; Col. Joseph J. Cody, Jr.; and Maj. William M. Land, Jr. All are with ARDC.

■ **Curtiss-Wright Corporation** has acquired secluded sites in Pennsylvania and New Jersey that may be used **to maintain production of aircraft engines in the event plants in metropolitan areas are wiped out** by enemy action. In announcing the plan, Roy T. Hurley, president of Curtiss-Wright, also said negotiations were underway for a big site in the Rocky Mountains. The areas were originally chosen **to test powerful and very noisy jet engines,** but Mr. Hurley said that they could be used for actual production of engines.

■ **Canada's first International Air Show** will be held on June 4 in conjunction with the **Eighth International Trade Fair in Toronto, Ont.** According to its sponsors, the show will be **an annual event** and will aim at attracting a cross-section of civil and military aircraft from all over the world.

■ On May 1, **Alexandria AFB, La., was renamed England AFB** in honor of **Lt. Col. John B. England** who had been stationed there before he was **killed in an aircraft** accident on November 17, 1954, while on TDY at Toul-Rosiere Air Base, France. Colonel England was born in Caruthersville, Mo., on January 15, 1923, and commissioned in the Air Corps in 1943. During World War II, **he flew 108 combat missions** in Europe and **destroyed nineteen German aircraft** —four of them on one mission. He is survived by his wife, Marilyn B. England, and their three children.

■ **Adm. John H. Towers,** often called the **"Father of US Naval Aviation,"** died of cancer in New York on April 30 at the age of seventy. One of the first Naval aviators, Towers organized **a flight of three NC-4s across the Atlantic** in 1919. His own plane crashed, but one of the others reached Portugal and became **the first to cross the Atlantic.** In 1939, Admiral Towers became the chief of the Bureau of Aeronautics and in 1945 he was appointed commander-in-chief of the Pacific Fleet. After retirement, he became a vice president of **Pan American World Airways.**

■ **STAFF CHANGES . . . Maj. Gen. Clarence S. Irvine** has replaced **Lt. Gen. Bryant L. Boatner** as Deputy Chief of Staff, Materiel, Hq., USAF. General Boatner will retire. . . . On July 15, **Brig. Gen. Ethelred L. Sykes** assumes duties as Deputy Director of the Budget, in the office of the Deputy Chief of Staff, Comptroller, Hq., USAF. He was with Hq., Alaskan Command. . . . **Brig. Gen. Clinton D. Vincent** replaces **Maj. Gen. Kenneth P. Bergquist** as Deputy Chief of Staff, Operations, Hq., Air Defense Command, on June 30. **Brig. Gen. Edwin L. Tucker** will replace General Vincent as Vice Commander of the Western Air Defense Force on that date. . . . On September 1, **Brig. Gen. Benjamin F. Webster** will become Commander of the 30th Air Division, ADC, Willow Run AF Station, Mich. General Webster is now in Ankara as Chief of the AF Section, The USAF Group, Joint Military Mission for Aid to Turkey. . . . On June 1, **Brig. Gen. Orrin L. Grover** assumed duties as Commander of the 3450th Technical Training Wing, Francis E. Warren AFB, Wyo. He had been Commander of the 2d Air Division, USAFE. . . . In April, **Brig. Gen. William J. Kennard** was released from duty as Surgeon, MATS, and assigned to the 1100th USAF Hospital, Hq. Command, USAF, Bolling AFB, Washington, D. C. . . . On August 15, **Brig. Gen. Woodbury M. Burgess** leaves the Air Defense Command where he is Deputy Chief of Staff, Intelligence, and reports to Hq., 6970th Supply Group, USAF Security Service, Washington, D. C., for duty as Deputy Director of Production, National Security Agency. New DCS/I of ADC will be **Brig. Gen. Robert Taylor,** who leaves his post as Chief of Staff, Allied Air Forces, Southern Europe. **Brig. Gen. Millard C. Young** will take over General Taylor's job. General Young has been Chief, Joint Subsidiary Plans Division, Hq., USAF, Office of the Joint Chiefs of Staff. . . . On July 15, **Brig. Gen. Charles H. Anderson** leaves his post as Director of Manpower Requirements in the Office of the Assistant Secretary of Defense, Manpower and Personnel and becomes Director of Operations in the Office of the Air Deputy at SHAPE. Present SHAPE Director of Operations, **Brig. Gen. Henry Viccellio,** will report to Hq., Ninth AF, Shaw AFB, S. C., on August 1 for duty as Special Assistant to the Commander. . . . **Brig. Gen. Charles B. Dougher** leaves his post as Commander, 5th Air Division, APO 117, New York, and reports as Commander of the 38th Air Division, SAC, Hunter AFB, Ga., on August 20. **Brig. Gen. Joseph J. Nazzaro,** present commander of the 38th, reports for duty as Commander of the 5th Air Division, effective upon departure of General Dougher. . . . On June 1, **Brig. Gen. David Wade** became Inspector General, Hq., SAC, Offutt AFB, Nebr. Succeeding him as Commander of the 21st Air Division, SAC, Forbes AFB, Kan., is **Brig. Gen. Alfred F. Kalberer,** who had been Commander of the 72d Strategic Reconnaissance Wing, SAC, APO 845, New York. **Brig. Gen. Bertram C. Harrison,** Commander of the 45th Air Division, SAC, Loring AFB, Me., succeeds General Kalberer on July 1. . . . In April, **Brig. Gen. Hoyt L. Prindle** was released from duty as Chief of Staff, Eighteenth AF, TAC, Donaldson AFB, S. C., and assigned as Deputy Commander of the Eighteenth. . . . **Brig. Gen. James Ferguson,** Deputy Commander of the Ninth AF, TAC, Shaw AFB, S. C., becomes Deputy Director of Requirements in the office of the Deputy Chief of Staff, Development, Hq., USAF, on July 11. Succeeding him will be the present Deputy Director of Requirements, **Brig. Gen. Bruce K. Holloway.**—END

Admiral has built COMMUNICATIONS for a sky-ful of planes

Standard communications equipment for nearly all military aircraft is the famed AN/ARC-27. This complex all-channel transmitter-receiver can be tuned to 1,750 VHF and UHF channels. Containing 56 tubes and upwards of 3,000 parts, this unit is being produced in vast quantities to keep pace with America's expanding air power. Approximately one out of every three transceivers completed to date has come out of Admiral plants.

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When ONLY ROBINSON

SHOCK and VIBRATION CONTROL for AIRBORNE EQUIPMENT

Only Robinson will do when, for best performance, you ***must*** have complete protection of vulnerable equipment against shock or vibration –

Or, when you ***must*** save weight and cost of a device, and only greater protection will make this possible. ***You can build a thing stronger or shake it less: the latter is by far the more economical procedure.***

Note that even the latest specifications for shock and vibration control are becoming obsolete, because of the rapidity of aeronautical progress.

Unprecedented engine power, speeds, and extremes of temperature subject electronic equipment to conditions never before encountered.

Unless these sensitive devices are fully and properly protected, their performance is interfered with, and their service life shortened.

At stake are no less than the safety of pilots and passengers, the performance of civil and military aircraft, and huge deterioration costs of equipment.

In the military field, it is not too much to say that the performance of jet aircraft and guided missiles is limited by the degree of protection afforded their control mechanisms. ***The success of a mission — the defense of an area — may stand on the performance of shock and vibration control mountings.***

WHAT TYPES OF CONTROLS ARE AVAILABLE?

Starting with crude rubber and springs, progress in shock and vibration control has now resulted in ***one*** and ***only one*** method for energy dissipation, which has ***all*** the following essentials:

1. Degree of control commensurate with shock or vibration to be controlled.
2. Multi-directional absorption—i.e., handling of shock and vibration from every angle.
3. Indifference to extremes of heat and cold and the presence of dirt, oil, grease, or other deteriorative influences.
4. Insurance against installation errors; reduction of installation time.
5. Long extended and unchanging performance of mountings.
6. Effective reduction of bulk, weight, and cost of equipment protected, from 15% to 25%.

Only in Robinson all metal mounts and Met-L-Flex Engineered Systems are all six of these essentials available. ***A direct comparison between Robinson and any other method under consideration will quickly prove the presence or absence of these vital characteristics.***

THE INADEQUACY OF SPRINGS

Springs alone, or combined with auxiliary dampers, where the springs do most of the work, have been outmoded by the Robinson resilient cushion concept. Spring-damping combinations fail because:

1. They are linear in action, and unable to cope with varying loads, or to afford protection against dynamic overloads.
2. They vary in performance with altitude and reduced atmospheric pressure and when dirt, oil, and moisture affect the surface friction between spring and damping devices.
3. Their service life is definitely limited.

HOW ROBINSON ALONE OVERCOMES THESE DIFFICULTIES

The fundamental advantage of all Robinson shock and vibration control is the dissipation of energy by means of fabricated wire resilient cushions and shock pads of patented Met-L-Flex.

These cushions, ***which are exclusive with Robinson,*** have the following advantages:

1. They possess inherent damping throughout, nearly five times greater than rubber.
2. Their interlocking wire loops resist compression progressively as the load increases.
3. They are highly effective in multi-directional design and application.
4. They are completely unaffected by changing atmospheric pressures; high or low temperatures; dirt, oil, moisture, or other deteriorative influences.
5. They provide ample protection against dynamic overloads.
6. Their service life is practically unlimited.

Note that in the Robinson Mounting, the spring that surrounds the Met-L-Flex cushion acts as a retainer, and handles only a small part of the work to be done. It is the cushion that carries the load.

WHAT ARE ROBINSON SYSTEMS?

Years of engineering experience supplying shock and vibration controls to more than 500 aircraft and commercial users have taught us that each job is a separate and individual problem. Good as the Robinson individual mount is, our engineered systems are not made simply by attaching a number of mounts to a tray. Using the engineering essentials incorporated in the basic Robinson concept, Robinson ***engineers each shock and vibration control system for the work to be done***—the maximum performance and protection of the equipment involved.

WHO USES ROBINSON?

Robinson is a leading supplier to the Government of shock and vibration control systems for the protection of airborne electronic equipment. Robinson Systems are in actual use in practically every military and commercial aircraft now flying and in a number of guided missiles; hundreds of designs are on our drawing boards for controls to be used in aircraft of the future. Robinson Systems are used by most of the leading manufacturers of military and civilian mobile ground equipment, by makers of light and heavy machinery, and by producers of shipping and carrying containers.

WHAT IS ROBINSON'S HISTORY?

Robinson has pioneered in the solution of shock and vibration control problems since 1936, culminating in the development of the revolutionary Met-L-Flex cushion first marketed in 1950.

In 1947 Robinson received from the Navy Department the award for "outstanding cooperation and assistance in producing for the Naval Service new and radically different shock mounts which greatly decreased electronic equipment failures due to vibration."

Steady advances have been made in all-metal mounts and systems, in multi-directional mountings (which Robinson has quantity-produced for 4 years), in fully engineered protection. Years of research, laboratory work and practical applications have enabled Robinson Mounting Systems to cope uniquely with the formidable problems involved in our defense operations. Robinson now supplies both the airborne and the industrial fields, serving its clients by both Eastern and West Coast engineering staffs.

The business of Robinson Aviation, Inc. has increased 8-fold in the past five years.

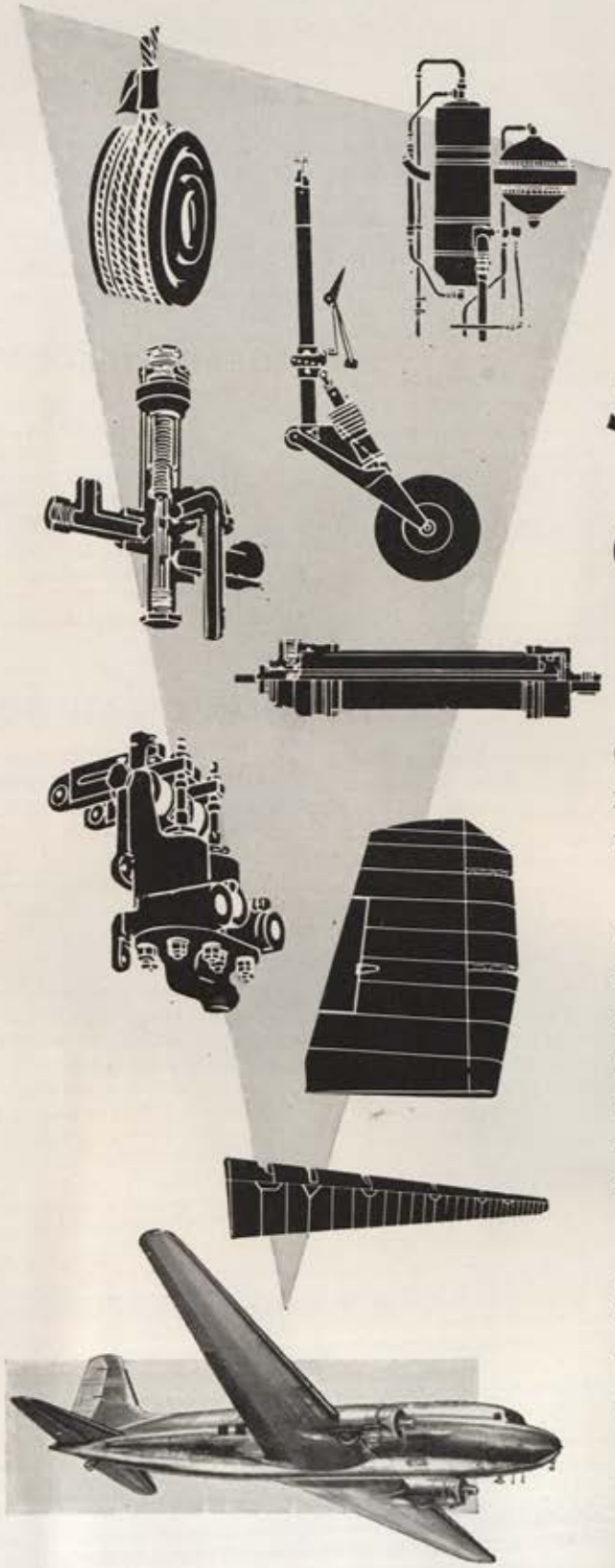
A WORD OF WARNING

Robinson success and the pressing need for effective shock and vibration control have encouraged the manufacture of low cost mounts and so-called systems which are definitely inadequate for the job that must be done. ***While such devices may meet existing specifications, they may not fulfill the actual requirements of this jet and atomic age.***

Robinson seeks only a clear definition of the work to be done, and an engineering appraisal of all available devices aimed at doing it. ***It is on this direct comparison that Robinson success has been built.***

ROBINSON AVIATION INC.
TETERBORO, NEW JERSEY
Vibration Control Engineers
AIRBORNE DIVISION

West Coast Engineering Office: 3006 Wilshire Boulevard, Santa Monica, Calif.



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SHOOTING THE BREEZE

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

Just at press time the Department of Defense chose to make this cryptic announcement:

"The Soviets have recently elected to expose some new aircraft developments in air parade formation over Moscow. These observations establish a new basis of our estimate of Soviet production of the heavy jet bomber and of the medium bomber. There has also been an appearance of a turboprop bomber and a new all-weather fighter has appeared as expected. This knowledge is evidence of the modern technology of the Soviet aircraft industry and the advances which are being made by them."

What happened was that ten Type 37s, roughly equal in performance to our new Boeing B-52, were spotted in a dry-run aerial parade over Moscow before May Day. The usual May Day flyover was cancelled because of weather. In this magazine last month we described this type and said it may be in limited production. The US has no B-52s in operational units as yet, but the first of them will be delivered soon to the 93d Heavy Bomb Wing, Castle AFB, Merced, Calif. AIR FORCE Magazine also predicted the Russian turboprop bomber more than four years ago and in our March 1955 issue described the new all-weather MIG-17. We'll have more to say on the Soviet air capability in a future issue.

☆

Jimmy Stewart's new movie, "Strategic Air Command," has been premiered three times—in Washington, Omaha, and New York. And we noted at press time that it was scheduled to "open" in Los Angeles, Philadelphia, Washington (again), and Chicago. All of which prompted a staff member to refer to SAC men as the "sung heroes" of the Air Force.

☆

Ed Miller's article "Seventy-Nine Hours" in our May issue produced the following exchange of correspondence:

"I thoroughly enjoyed your article describing the rescue operations following the B-47 crash on Lincoln's Birthday. I was navigating an APGC C-47 back from Ladd at the time but we only glimpsed small facets of the effort.

"In 1938, I worked with a Pittman at the New Jersey

State Hospital in Trenton. He was tall and lithe, Lincolnesque in profile and character. The grandson of the shorthand Pittman, he was raised at Mooseheart after the death of his parents. He excelled at track sports, particularly the hurdles. I lost track of him until after World War II, when his picture appeared in many of the Sunday supplements as the inventor of a side-car for a tandem bicycle. He had gotten out of the service, and was living near Camden, I believe. Because of the automobile shortage, he and his wife were making Sunday trips on a tandem wheel. The addition of a child made the side-car a necessity, and the resultant publicity put their picture in the rotogravure.

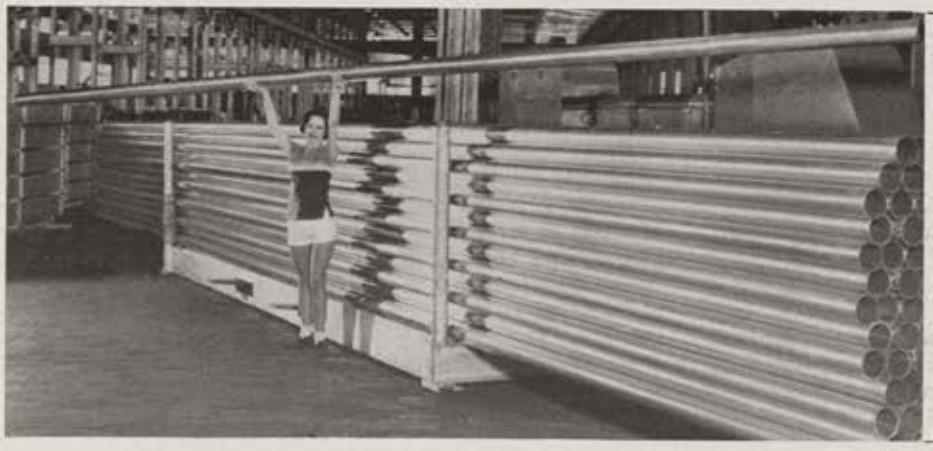
"Will you not check for me to see if this is the same Pittman? The face and character sound so much like the fine chap I knew seventeen years ago. That a Lincolnesque track man should lose a foot on Lincoln's Birthday seems highly ironic, and I'll admit that the whole story read like a soap opera, but maybe life does mimic art sometimes.

Sincerely,
Lt. Col. Theodore W. Bozarth, USAF"

We checked with Maj. Lee Gulley, Acting Chief of Information at Fifteenth Air Force, who told us:

"We're sorry to have to report that our Captain Pittman

(Continued on following page)



Our Cheesecake Department (called "Breeze Cheese" or "Breezecake" around the office) features a mystery woman this month. This picture came in with the caption partly torn off. All that was left was the intriguing fragment—"This young lady is shown displaying some of..." Know who she is and what she's displaying? The product that is.

is not the gentleman about whom Lieutenant Colonel Bozarth is inquiring.

"It's unusual, in a way, because *our* Captain Pittman was an outstanding track man in his youth—particularly the high hurdles. Some years ago his picture appeared quite regularly in the Sunday supplements—but as a model for a concern which sells a still-popular hair dressing—not as a side-car inventor.

"Pittman, by the way, is doing just fine. He's recuperating at home and is contemplating the purchase of a pogo stick to get from the TV set to the ice-box.

"Sorry to disappoint the colonel.

Sincerely,
Maj. Lee R. Gulley, USAF
Acting Chief of Information"

Now we're intrigued. Who knows the whereabouts of the Pittman whom Colonel Bozarth mentions?

☆

Herb Kalish has been working for the Air Force Association for as long as we've known either of them. Since May 1, however, he's been getting paid for it. Kalish, Herbert B., now works with Ralph Whitener as Assistant for Special Events. AFA Convention-goers know him for his volunteer work during the last two national meetings. Herb is a native of New York City where he attended George Washington High and New York University. He spent four years of active duty during and after World War II as a navigator in the Eighth and Thirteenth Air Forces and as a radar operator in SAC and the Air Rescue Service. He's a Ready Reservist, Adjutant of the 9462d Air Reserve Squadron. Before coming to work for AFA, he was a cartographer with the Aeronautical Chart and Information Center in Washington, and Commander of the Capital Squadron of AFA.

"Remember, if that cigarette *wasn't* lit, we rendezvous here in twenty minutes!"

☆

What seemed at first glance to be a bold public relations stroke came a cropper when the House of Representatives voted to call the Navy's fifth supercarrier the *USS Kitty-hawk*. The Navy had coyly suggested that it be named *USS Congress*. All of which led to wild speculation around our shop as to what the sixth, seventh, or eighth carrier might be called. *USS Appropriations Committee* was one suggestion. Or *USS Bureau of the Budget*. One office die-hard, though, held out for naming one of the supercarriers for the greatest unsung naval hero of them all—*USS Taxpayer*.

Air Force medics will soon wear a new insignia. Maj. Gen. Dan C. Ogle, the Surgeon General, takes a look at the new device, being modeled above by Lt. Ernest H. Teagle. Brig. Gen. Otis O. Benson, Jr. (center), worked with the Air Force's heraldic section on the design (shown in close-up at left)). The badge is silver, has the traditional caduceus.

☆

In a recent issue of *The New York Times Book Review*, Stephen Potter, a favorite author of ours (*Gamesmanship*—or *The Art of Winning Without Actually Cheating*) lists two rules for dealing with editors which hit home. They are:

"First, make no attempt to deliver your copy on time. If the editor gives you a deadline, forget about it and start writing an article for somebody else. If given an absolute deadline, ring up the office boy and ask him privately when he thinks the stuff is really going to press.

"Second, allow no cuts. If the editor begins to expostulate tell him that of course he can do what he likes with your copy, it's his job, and there's nothing more pathetic than an editor who isn't the real boss. 'Still I thought you realized,' you can go on, 'that this was something I wanted to say, with a shape and rhythm of its own.' "

We would have qualms about distributing this intelligence further except that most of our authors seem to know these things instinctively.

☆

Apropos the new and tighter security policies regarding release of public information—the sign in one Pentagon men's room which used to read, "Discussion of Classified Material in Reception Rooms and Public Places is Dangerous," has been altered by an anonymous wag to read, "was Dangerous, but it is HELL now!"

☆

Best news to come out of the Pentagon in many a year is the tidings that the Air Force has declared war on gob-

(Continued on page 27)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bledegook. A small task force is analyzing AF publications and correspondence in an effort to make them make sense.

Example—"The policy of the Air Force with respect to the use of oleomargarine is that it should be used in a ratio to butter in a proportionate amount to be predicated on its acceptability to the airmen." What this means, according to the AF readability experts, is this—"The Air Force wants as much oleomargarine to be substituted for butter as airmen will accept." We think they could even go a step further and say, "Give 'em all the oleo they'll eat." We wish this hardy band the best of luck. We must confess to some pessimism about their endeavors, however. Through the centuries, the gobbledegook wilderness has swallowed up many similar invasion forces much as the Russian vastness digested Napoleon's legions and the German Wehrmacht.

☆

We didn't say this. Columnist Fletcher Knebel did in *The Washington Star*—"Admiral Carney denies he predicted a Red Chinese attack April 15. Navy men are no good at foreseeing the future. If they were, they would have joined the Air Force."

☆

Sen. Barry Goldwater, Republican from Arizona, is a veteran pilot and long-time Air Guardsman. In late April this year, old flyer Goldwater took the Senate floor to suggest what he called "a new national concept of airpower strategy which may be applied to our land and sea forces in the future, to the end that those forces will reflect their adequate strength as being dependent primarily upon the power of the Air Force."

"This means," said Goldwater, "that airpower becomes the primary manifestation of national power, in war and in peace, because of its direct influence upon the social structure and war-making potential of an enemy nation. If we, as a people, are willing to accept the new doctrine that peace can be maintained through airpower, then we will not be like the professional soldier of old who was very reluctant to give up his particular weapon or his particular pet strategy. We will become a people fully aware of the problems of war and a people determined to support this kind of an approach to peace, psychologically, industrially, politically, and in every other way incumbent upon us. It will better enable us to understand the necessity of evaluating existing and contemplated weapons systems. This is not a question of building up one service at the expense of another. Rather it is a matter of obtaining the greatest possible return from our dollar investment in the military forces as a whole. Once this is done, the force requirements can be determined accordingly and phased to meet the time requirements of our strategy."

Amen!

☆

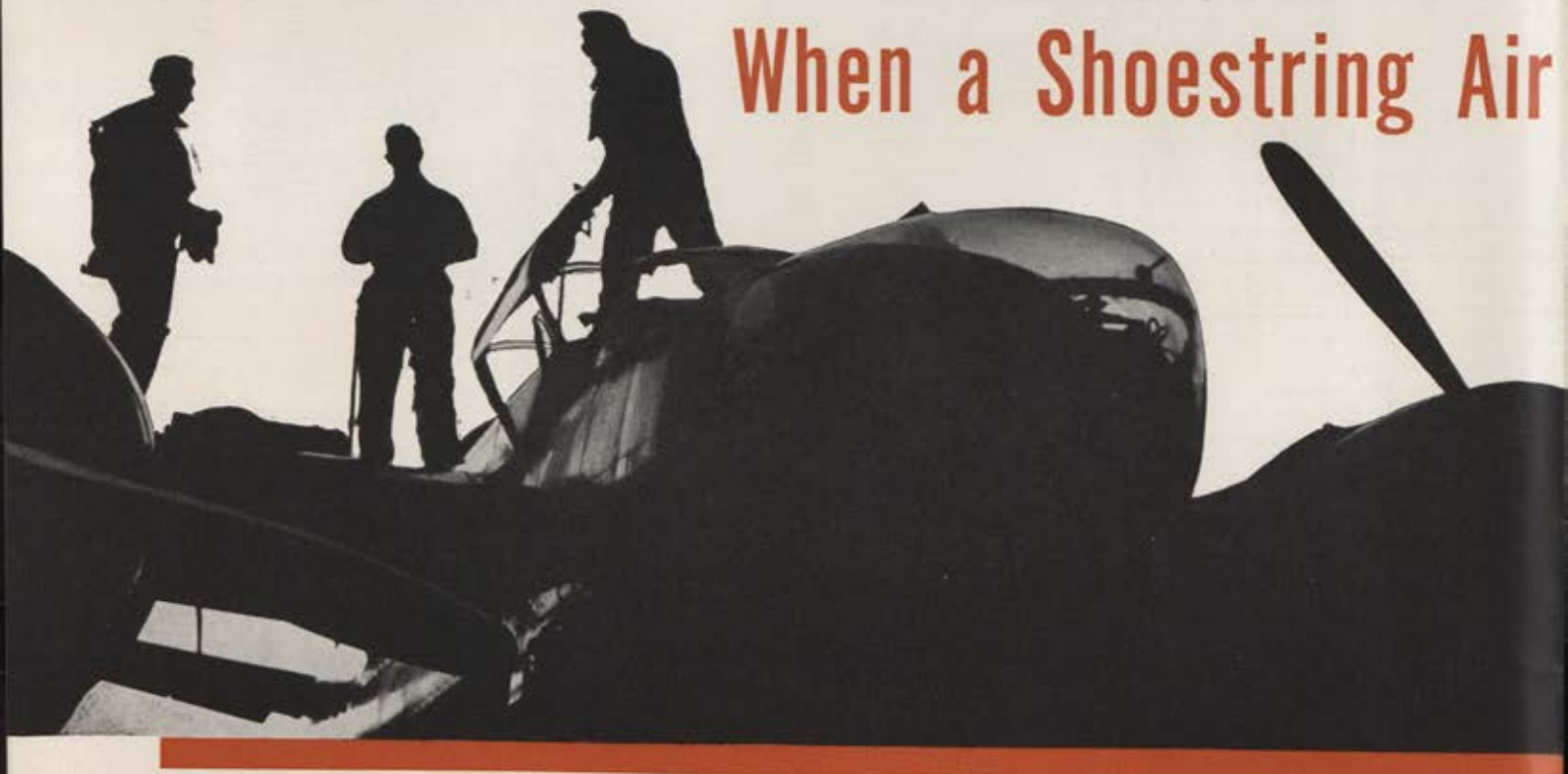
Two months ago we suggested that the nation's civil defense problem might be dramatized by the issue of individual dog tags. We claim no degree of prescience in the matter, but we are pleased to learn that the Federal Civil Defense Administration is doing just that. A canned milk company is footing the bill. You can get your set through your local grocer. In general, though, the civil defense program is still a baby looking for a doorstep. The governors of the several states agreed recently that the advent of the H-bomb has made the civil defense problem too big to handle on a state and local basis. They want a new law giving the Federal government at least equal responsibility.

The USAF now has an Air Force-wide sentry dog training program designed to tighten air base security without increasing the manpower requirement. Here T/Sgt. James Hogan and "Airman Basic" Leigh take a high walk hurdle at the Strategic Air Command's sentry dog school at—appropriately enough—Barksdale AFB, La. FEAF and USAFE have been using sentry dogs for security work for years.

AIRMAN'S BOOKSHELF

Once again this month we're reprinting a portion of a new book. This time it's *Beyond Courage*, the book of Korean escape and evasion stories by Clay Blair, Jr., which we discussed in this department last month. You'll find the first installment beginning on page 55. . . . A handy little volume from Harcourt, Brace & Co. crossed our desk recently. It's called *Wings in Your Future* and discusses the principles of flight in simple, easy-to-understand terms. Two teachers in the New York City public school system collaborated on it—Leo Schneider and Maurice U. Ames. It's aimed at the junior-high level but readers in every age bracket will find it enlightening. The price tag is $2.75. . . . The Lincoln Press in Washington is out with the *Aircraft Yearbook* for 1954. It's the thirty-sixth annual edition of this official publication of the Aircraft Industries Association and retails for $6 a copy. A new feature is a pictorial review of aviation highlights of 1954. . . . Medics and others interested in aviation medicine will want to read *Doctors in the Sky*. The author, Col. Robert J. Benford, is a USAF physician who covers the growth of the Aero Medical Association since its founding in 1929 and the parallel advances in aero-medical science during that period. Charles C. Thomas, Springfield, Ill., is the publisher, price is $8.75. . . . Last month, in an attempt to bow from the waist in the direction of the Magazine and Book Branch, USAF Office of Information Services, we fell flat on our face. In saluting Maj. Bill McGinty and Capt. Jim Sunderman of the Branch, we neglected to mention our good friend, Capt. Phil Garrison of the same office, who is very much in the picture. . . . We goofed off but good in the same column when we said that Tooey Spaatz did the foreword for Blair's Book. General Spaatz did the honors for Dale Smith in *US Military Doctrine*. The foreword for the Blair book is by General Twining, as you'll note on page 56. No excuse, merely an apology.—END

When a Shoestring Air

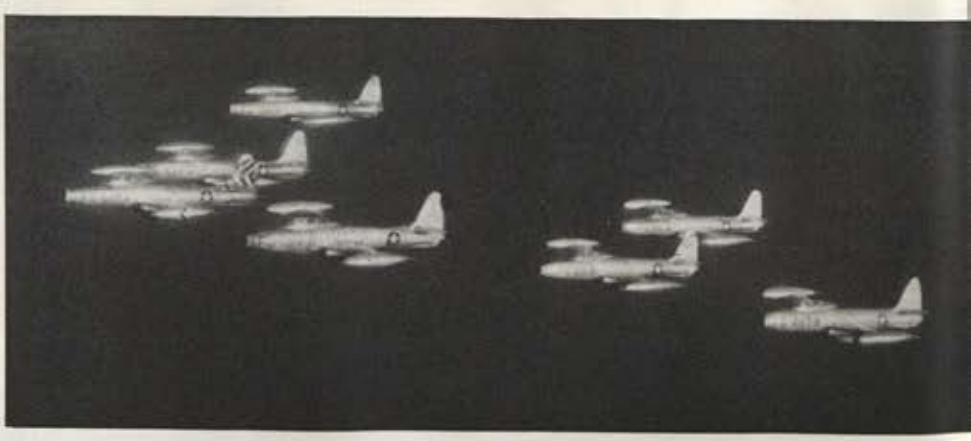


Douglas B-26s were the backbone of the night intruders whose attacks on Red transportation pinched supply lines.

A mustache was de rigueur for AF pilots. This is Capt. Bernard Barton.

FIVE years ago, at four o'clock on a Sunday morning, June 25, 1950, the Communist time table for aggression hit a snag. The North Korean People's Army swept across the thirty-eighth parallel with the political purpose of unifying by force all of Korea under a Red regime. The snag wasn't apparent at the time. The Free World was caught off balance momentarily. Obviously, the schemers in the Kremlin had no thought that the United States or the United Nations might intervene. Or they figured they would have all of Korea in their grasp before the Free World could take effective military action. They were wrong. The United Nations, led by the United States, voted to intervene. And aircraft of the Far East Air Forces were in action over South Korea less than eight hours after the UN voted. It was the beginning of a war—fought to an inconclusive decision, it is true—which wrote another proud chapter in the short history of the US Air Force. That Air Force had been weakened by puny budgets—a "shoestring Air Force," in the words of the man who then commanded it, Gen. Hoyt S. Vandenberg. But it improvised, worked hard, called on its Reserves and Air Guardsmen, and did its job. Here is a look at some of the men and planes that combined to do it. "Lest we forget" may be hackneyed, but it makes sense.—END

Tac control groups in lonely mountain outposts were supplied by paradrops.



Republic F-84 Thunderjets carried the load in the daily tactical battle against Red troops and supplies. The fighter-bombers' interdiction effort was a key factor.

Force Went to War

World War II vintage prop jobs, like this North American F-51, were pressed into wintry service in the early days of Korea. There weren't enough jets to go round.

Napalm proved an invaluable weapon against well dug-in Red ground troops (left). North American F-86s (right) were the only planes that could cope with the MIG.

Jet aces got the headlines but faithful ground crews worked round-the-clock to keep tired aircraft in the air. And there was no time-and-a-half for overtime.

Air Rescue came into its own with Sikorsky H-5 'copters in a key role.

Korea's jagged mountains made air supply a vital need. Fairchild C-119s and other combat cargo planes flew mission after mission.

Planes don't get Purple Hearts but many, like this battle-damaged Lockheed F-80, more than earned them.

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way, anywhere

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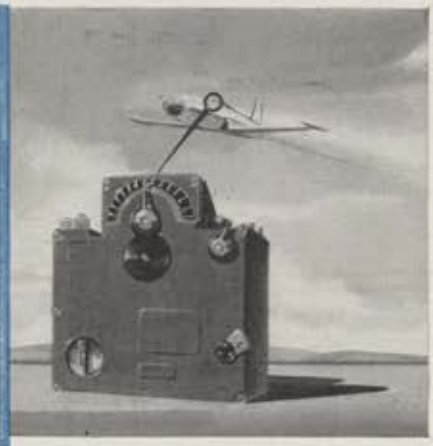

A-4 Fire Control equipment for military aircraft.

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* * *

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WICHITA, KANSAS

AIR FORCE
JUNE 1955

OUR CAPTIVE FLYERS

By John R. Alison
President, Air Force Association

Hope Is Not Enough

Our fifteen airmen, still imprisoned in Red China, are living on hope alone. But you can't exist on hope indefinitely

LAST month, in this same space, we discussed some of the problems which are facing the men and women of our Armed Forces and, for understandable reasons, those of the Air Force in particular. Some of you may have noted what appeared to be a glaring omission in that editorial.

No mention was made of one Air Force personnel problem about which we feel most deeply—the terrible plight of the fifteen unfortunate American Air Force flyers who have been languishing in Red Chinese prisons for as much as two and one-half years.

I didn't talk about the captured flyers last month because it appeared that it might do more harm than good. The conference of Asiatic nations at Bandoeng was scheduled to begin on the day the May issue of AIR FORCE Magazine came off the press. There was an optimistic feeling at the headquarters of the United Nations, in our State Department, and in the Pentagon that the time was ripe for Chou En-Lai to make a magnanimous gesture of

(Continued on following page)

peaceful propaganda by offering to release our airmen as a possible gambit at the conference.

Several factors combined to generate this feeling of optimism. For one thing, our State Department had granted permission for the seventy-six Chinese students being detained in this country to return to Red China if they wished. There had been an exchange of correspondence between Chou En-Lai and the UN Secretary-General, Dag Hammarskjold, which seemed to hold out some hope that the prisoners might be released. It was also reported that President Eisenhower had suggested, on a man-to-man basis, that General Zhukov of the USSR, as an old soldier himself, intercede personally on behalf of the captured flyers. And there were other straws in the wind which made it appear that a strong stand on the part of the Air Force Association at that particular time might upset a delicately balanced apple cart.

But Bandoeng has come and gone. And the American airmen are still counting the days and trying to remember what their loved ones look like. The only change in their status is the fact that the Chinese Red Cross has agreed to distribute relief parcels sent to the prisoners from their families and friends. Some saw in this a softening of the Communist Chinese attitude. But better-informed people tell me that this is more likely an easy way for the Chinese to get the prisoners equipped with warm clothing and food for a long cold winter. So optimism has been replaced by pessimism. Even Mr. Hammarskjold, who has pursued negotiations in the patient manner of classic diplomacy, acknowledged at a recent news conference that he was beginning to feel "a certain impatience."

I'm sure I speak for all members of the Air Force Association when I say that "impatience" scarcely begins to express our feelings on the matter. I'm angry. The Air Force Association is angry. The majority of the American people should be angry about this travesty on justice and civilized international conduct.

Just recently I attended the convention of the California Wing of AFA, at Fresno. There the Ladies' Auxiliary passed a resolution which was subsequently adopted by the entire convention. I think it expresses what I mean. Stripped of the "whereases," here is the gist of it.

Diplomatic efforts to release the flyers have failed. The unjust imprisonment of our service men for political purposes is an invasion of human rights and an act of aggression against the United States. The matter is corroding the moral fiber of our nation and, if not corrected, cannot help but adversely affect the readiness of our young men to answer their country's call. Since Soviet Russia has armed, equipped, and assisted Communist China in her acts of aggression, it is incumbent upon President Eisenhower to place the blame for this aggression where it belongs—upon Soviet Russia. The President, therefore, should take decisive action directly with the USSR to obtain the release of these fifteen airmen and all other US service men now held in Red prisons. Further, the wives and mothers of the nation are entitled to know what action their government will take if their husbands and sons are imprisoned under similar circumstances in the future.

This is pretty strong talk. But we've given the "sweet talk" approach a good try over the past several months. It hasn't worked. That it hasn't is no reflection on either the skill or the patience of our negotiators. But sitting down at a conference table without some bargaining alternatives is like going to an auction without any money in your pocket. You can bid like crazy but you can't buy anything. When the Red Chinese say "No," our negotiators have to back off and start all over again.

I'm not in favor of using human lives to bargain with. Neither is our government. We let the Chinese students go with no strings attached. We hoped this act would solidify our moral position and that world opinion might exert enough pressure on the Red Chinese to cause a shift in their attitude. We hoped that the efforts of the UN Secretary-General would bear fruit. We hoped that the Bandoeng Conference would force a change. We have been living on hope. So have the imprisoned airmen. So have their wives, their children, their parents. But hope is not enough. You can't exist on it indefinitely without faith. And surely the faith of these men in all of us here at home must be beginning to totter.

There used to be a saying on our western frontier—"Talk's cheap, mister." It was another way of saying, "Put up, or shut up." It seems to me we're reaching that stage in our maneuvering with the Communists.

The nub of the whole matter, the essence of the moral clash between democracy and totalitarianism, is distilled and exhibited in microcosm in the case of the fifteen airmen. On the one hand, we have a deep and basic belief in the innate dignity of the individual, of the right of every man to "life, liberty, and the pursuit of happiness." On the other hand, we find a callous disregard of human rights, with the individual subordinated to the tyrannical whims of an all-demanding state. Fifteen lives—be they Russian, Chinese, or American—mean nothing to the Communists. But if we really believe in the fundamentals on which our nation was founded, then these fifteen lives should mean everything to us. And if this all be true, then hand-wringing and palavering have served their purpose and more drastic measures are in order.

Last fall, in my capacity as President of the Air Force Association, I wrote a letter to the President of the United States. I would like herewith to repeat the concluding portion of it as an indication that what we said then still goes:

"We commend your interest in the release of these unjustly imprisoned American citizens and your public statements in this regard. We assure you that firm action to meet this critical situation will receive the support of the Air Force Association and, we believe, the support of other Americans."

The situation is still critical and firm action is still called for—the sooner the better.—End

THESE ARE THE CAPTIVE FLYERS

LT. COL. EDWIN L. HELLER, Wynnewood, Penna.

LT. LYLE W. CAMERON, Lincoln, Nebr.

CAPT. HAROLD E. FISCHER, Swea City, Iowa

LT. ROLAND W. PARKS, Omaha, Nebr.

COL. JOHN K. ARNOLD, Silver Springs, Md.

MAJ. WILLIAM H. BAUMER, Lewisburg, Penna.

CAPT. ELMER F. LLEWELLYN, Missoula, Mont.

CAPT. EUGENE J. VAADI, Clayton, N. Y.

LT. JOHN W. BUCK, Armathwaite, Tenn.

LT. WALLACE L. BROWN, Banks, Ala.

T/Sgt. HOWARD W. BROWN, St. Paul, Minn.

A/1C STEVE E. KIBA, Akron, Ohio

A/2C HARRY M. BENJAMIN, JR., Worthington, Minn.

A/2C DANIEL C. SCHMIDT, Scotia, Calif.

A/2C JOHN W. THOMPSON, III, Orange, Va.

A SPECIAL REPORT

How far away is straight up?

Efforts to reduce take-off and landing lengths mean we should be able to spend more money on aircraft, less on concrete

SINCE Orville Wright first became airborne in less than sixty feet, the take-off distances of combat and transport aircraft have been getting longer and longer. Now aircraft—both military and commercial—must charge down many thousands of feet of thick concrete before they can finally lumber into the air. The coming of the jet engine has so far only aggravated the problem, since the relative inefficiency of the turbojet at low speeds makes take-off distances longer.

How long can this go on? How, in a thermonuclear era, can we continue to base scores of fighters and bombers on relatively few large and vulnerable bases? This air base problem is one of the most critical facing the Air Force today. Unless it is solved, a large part of our striking force—offensive and defensive—may never live to become airborne in an enemy attack.

Obviously, the first targets for the enemy's nuclear weapons will be our ability to retaliate. This is true whether the war should be a global conflict, in which case SAC's bases will be the primary targets, or a so-called "local" war, in which tactical air forces will be clobbered first. And an operational air base—with its facilities, runways, and aircraft—is a juicy target.

The answer is dispersal—to present so many targets that the loss of any one, or several, would not cripple our ability to fight back. The problem is: how can we best disperse?

Let us look at some of the possibilities within each of the major mission areas of the Air Force.

● **Strategic Air**

Dispersing SAC would call for a staggering effort. The costs of additional bases for the B-36, B-47, and B-52—with the long, thick runways required, the maintenance and operational facilities, housing, security forces, and a myriad other vital components—would be tremendous. But these costs become unimportant when compared to losing a large part of SAC on the first Soviet strike.

We are dispersing now, to a certain degree. We are building a network of air bases around the world, in England, Spain, North Africa, Turkey, Japan, and Okinawa. Some of these will be the home bases of medium-range bombers, only a short flying time from Soviet targets. Other bases will be used for pre- and post-strike staging of intercontinental bombers. These bases will be vital links in the bombardment chain between the US and Soviet target systems. The more bases available from which to launch strikes the greater our chances of crippling Russia before she cripples us.

Zero length launching has been successfully demonstrated by the Glenn L. Martin Co. A powerful rocket boosts an F-84G to flight speed in a few seconds.

How do we shorten SAC's runways? Several things have already been done. One is the addition of the four jet engines to the B-36 to give both a shorter take-off distance and increased speeds. Another example is the use of RATO and a drag 'chute on the B-47.

One factor which should help is the fact that aircraft designed for ever-increasing flight speeds require greater installed thrust. This means larger engines, with afterburners. This increased thrust, for a given take-off weight, will accelerate the airplane to flying speed in less distance. Unfortu-

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nately, the flying speed at which these aircraft become airborne is increasing because of the higher wing loadings (smaller wings) needed for faster flight speeds. Here, then, we lose some of the gain we just made in take-off distance.

However, if we want not only higher speeds but also higher altitudes, we cannot allow the wing to shrink too much. The result is larger engines plus a limitation on how much wing area we hack away—a combination that still provides a reduction in take-off distance over today's jets.

B-47 takes off with rocket assist. RATO and drag parachutes help to shorten SAC runways.

What about nuclear propulsion? The maintenance and handling facilities may be far more complicated than those of a conventional base for chemically-powered aircraft. Much of the work must be done by remote control because of the radiation hazard. Economic and logistic considerations will dictate that we build only a relatively few such bases. Their invulnerability must come from "hardening" them—by building them either underground or in mountain sides.

But this still leaves the runway. Will a nuclear-powered bomber inherently have better take-off characteristics? Probably not. The nuclear bomber will, of course, have unlimited range, and will no doubt weigh less than a chemical bomber designed for extremely long ranges. However, if the two airplanes—nuclear and chemical—are to have similar flight performances in speed and altitude, their ratios of airplane weight per pound of engine thrust and airplane weight per square foot of wing area will be about the same. And these two factors dictate take-off distances.

How about water-based aircraft, then? Here we find a glimmer of light. The art of hydrodynamics is now beginning to catch up with the art of aerodynamics. The water-based aircraft is no longer just a flying boat but a bona-fide airplane. Take the Martin XP6M-1 high-speed minelayer,

Martin's XP6M-1 Seamaster. Bombers based on water could be dispersed easier.

developed for the Navy. This 600-mph-class airplane is powered by four Allison J-71 turbojets. Its primary mission officially is mine laying, but there is no reason why it could not also be used for atomic bombing. As such, it conceivably could be based for short periods of time at any number of places around the periphery of Eurasia—on lakes and rivers, and in sheltered bays and coves.

While this concept would eliminate the vulnerability of runways, it raises other problems of maintenance, handling, and operating equipment to make the vehicle an effective weapon. There is no reason why equipment cannot be devised for handling and maintaining a water-based aircraft in the water. But the equipment would be much more complicated and difficult to employ than that for land-based aircraft.

Certainly it would behoove the Air Force to carefully evaluate the potentialities of water-based aircraft to augment its nuclear bombing capability.

Both the US and the USSR are working hard on the "ultimate" weapon—the intercontinental ballistic missile, or ICBM. This is not only the "ultimate" weapon, but it is the ultimate in eliminating runways, since it is launched vertically and needs only a launching pad.

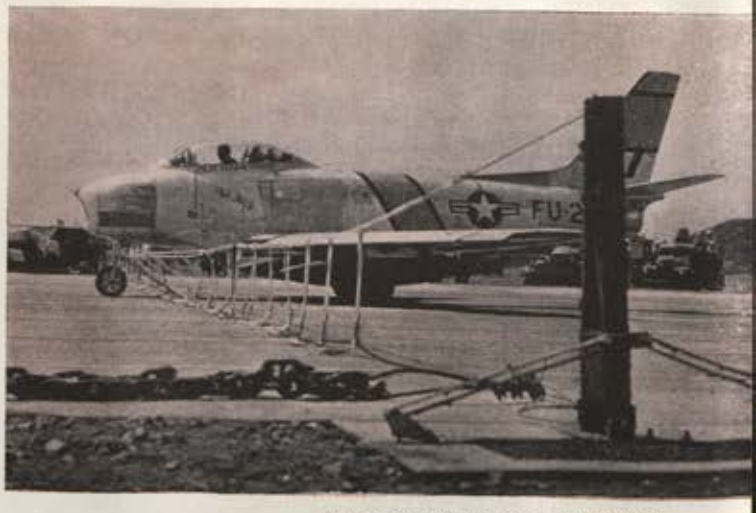
The problem of basing the ICBM is similar to that of basing the nuclear-powered bomber, but does not require so much space. That is, the cost of a launching site for the ICBM, as for the nuclear bomber, is likely to be so high that we probably won't be able to build more than a few of them. On the other hand, the few launching sites can be made relatively invulnerable by putting them underground.

- **Tactical Air**

President Eisenhower has said that he sees no reason why atomic weapons should not be used tactically, just like bullets, against strictly military targets. But a tactical base from which to launch nuclear attacks is a good target for enemy nuclear weapons. Dispersal, again, is one answer.

Putting fewer aircraft on a base would certainly be a step in the right direction. But reducing landing and take-off requirements is even more important.

There is no *one* answer. The military services and the aviation industry are exploring many and varied solutions. These projects run the gamut from small decreases in take-off and landing roll, down to the ultimate in



Net barrier was used as an emergency measure during the Korean war, might be one solution to the runway problem.

short field capability, i.e., no field at all—vertical take-off and landing. Each scheme has its merits. Each also has its penalties—in compromising the flight performance of the airplane, in operational and maintenance complexities, in added logistic requirements, or in increased costs.

Let us examine some of these possibilities.

Rocket-assist take-off—This has proved workable for some years. In some cases the rocket-assist engine is an integral part of the airplane. In other cases, the rocket unit is attached externally to the airplane, and dropped and recovered after its propellant is exhausted. In fighters, it would be important to leave this weight at home once it has served its purpose. (On the other hand, an integral installation would permit its use when short bursts of high speed or acceleration in combat were required.) The use of RATO increases the logistic problems of an operation, involving the added weight and handling of the complete rocket units for solid propellants, or—in the case of liquid rockets—the liquids themselves, or facilities for producing them.

Zero length launching—This is rocket-assist take-off to the Nth degree. Its feasibility has been demonstrated by the Glenn L. Martin Co. project of launching an F-84G from a cart. A high-thrust rocket is attached externally to the F-84, and boosts the airplane from its inclined position to flying speed in a few seconds. These launching carts, and their airplanes, could be widely dispersed. But this solution still leaves the problem of landing roll. The logistic problem is more severe than for RATO.

Auxiliary turbojet engines—Fairchild's Engine Division has been experimenting with a 1,000-pound thrust J-44 turbojet mounted atop a C-82, and two J-44s on the wing tips of a C-123, to reduce the take-off distance. This is all right for large, relatively slow aircraft, but the added weight is a problem.

Catapult and arrest gear—There is no reason why this method, used for years aboard aircraft carriers, could not be used on land. There are many types of catapult and arresting mechanisms that could serve on small landing strips, including such motive power as steam, powder charges, and rocket-powered launching dollies. They would have to be relatively light in weight, easily transported by air, and able to launch and recover at a fast clip. Existing aircraft have to be modified to withstand the added loads, but this would impose only a slight weight penalty.

Barriers—A net barrier, similar to those used on aircraft carriers, was used in Korea as an emergency measure, to prevent over runs at the ends of landing strips. Such nets have been installed on several Air Force bases, and Convair uses one at the end of a main runway at Lindbergh Field, San Diego.

Drag parachutes—These have been proved on the B-47, F-94C, and others. Because they are a drag device, the 'chutes are most effective when first released, i.e., at the highest speed, and decrease in effectiveness as the airplane slows down. They add weight to the airplane where it does the most harm—the tail—and they must be repacked after each landing.

Smallest and lightest Navy jet combat plane—the Douglas A4D Skyhawk.

Reserve thrust mechanism—A more positive way to cut landing roll. The reverser deflects the turbojet gas stream through an angle greater than ninety degrees, so that there is actually a reverse component of thrust. It is possible to provide reverse thrust equal to fifty percent or more of normal forward thrust and cut the landing roll in half. Thrust reversers are being worked on by Marquardt, Boeing, and Aerojet-General, with some important basic work being done by NACA and Wright Air Development Center. The latter has tested a thrust reverser on an F-84F, with the aim of being able to retract the deflecting mechanism clear of the gas stream when the reverser is not in use, so there will be no penalty in normal performance of the airplane. But again, the added weight is located where it is least desired.

Deflected thrust axis—Take-off roll can be decreased by deflecting the engine axis so that it is vertical rather than horizontal. This can be done by rotating the entire engine, difficult mechanically, or by rotating the tail pipe, or by inserting a mechanical deflector into the gas stream. The British have equipped a Meteor powered by two Nene turbojets with alternate tail pipes in a deflected position for use in slow flying research.

Boundary layer control—By aerodynamic control of the boundary layer (the layer of slow-moving air next to the surface of a wing), the lift coefficient of the wing can be increased at low flight speeds. With greater lift, the stalling speed of the airplane can be reduced, resulting in lower take-off and landing speeds, hence shorter distances. Of course, power is required from the main engine or from auxiliary engines to bleed off this boundary layer air—added weight again. The first production model to use boundary layer control is the Navy's Lockheed T2V-1 (see "Tech Talk," p. 85).

Dolly take-off and skid landing—The French experimental fighter, the *Baroudeur*, has no landing gear, but takes off under its own power from a wheeled dolly. It lands on skids that are normally retracted into the under surface of the fuselage. The high friction on landing provides a short landing distance, and the take-off distance is reduced by auxiliary rocket engines. The dolly makes it possible to take off from unprepared surfaces.

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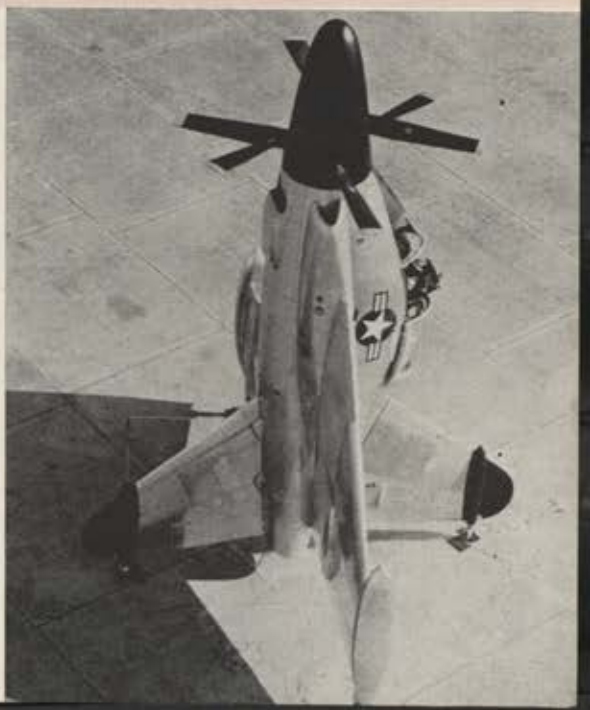
Convair XFY-1. VTOL is probably the best answer to freedom from prepared runways.



Lightweight designs—This approach is receiving a great deal of attention, both in Europe and here at home. These are stripped-down aircraft, sacrificing flexibility and versatility for small size, easy maintenance, and low cost of construction and operation. The European fighter designs include the British Folland Gnat (6,000 pounds), the French S.N.C.A.S.O. Trident (11,000 pounds), and the Italian Aerfer Sagitarrio (8,800 pounds). Lightweight European ground attack aircraft designs are the British Avro 725 and Folland Gnat 2, the French Brequet 1001 Taon and 1002, the Dassault Mystère 26, and the Italian Fiat G.91.

Weight reduction means inherently improved take-off and landing characteristics. However, this does not come free, since the over-all military usefulness as a fighting machine is also reduced. This does not mean that there is not room for weight reductions in "conventional" aircraft.

The lightweight—or lighter weight—concept in this country is evidenced by the Air Force Lockheed F-104 fighter and the Navy Douglas A4D Skyhawk attack airplane. These airplanes are not as light as the European designs, weighing around 15,000 to 18,000 pounds. However, it must be expected that the US airplanes are more effective, as well as more expensive, combat weapons.

Vertical take-off and landing—The ultimate in short field operations is vertical take-off and landing, with freedom from prepared fields.

But it is easy to become so entranced with the up-and-down aspects of flight that we forget that the airplane must perform respectably in a forward direction as well. Otherwise we would be quite satisfied with a helicopter. The VTOL concept poses a basic problem, since the total take-off thrust must be greater than the weight of the airplane. This means large power plants, likely larger than the aircraft needs for flying once it gets off the ground.

One type of VTOL aircraft sits on its tail, goes from a vertical to a horizontal attitude after it is free of the ground, and squats back down on its tail in landing. The Convair and Lockheed turboprop VTOL Navy fighters show that vertical take-off and landing—and the transition to normal flight attitude—is feasible. These aircraft are frankly experimental and have knowingly sacrificed supersonic speed for the ability to take-off and land vertically. But this is too high a price to pay in the supersonic era.

Future "tail sitters" could very well be powered by turbojets, rockets, or a combination of the two. One of the earliest VTO fighters was the rocket-powered Bachem Natter, built and tested by the Germans near the end of the war. This small aircraft—or piloted missile—was expendable, since after the pilot fired his rockets he bailed out and left the vehicle to crash. It was not ready for service by the end of the war. Another German VTO design, which never reached the prototype stage, was a Focke-Wulf design, powered by a large rotor revolving around the fuselage. Ramjets were mounted on the rotor tips.

The Reds are said to have a Polish-designed VTOL fighter, powered by a combination of turbojet and rockets. (AIR FORCE, February '53.)

Ryan Aeronautical Corp. is working on a jet-powered VTOL aircraft for the Air Force.

While there are advantages to a tail-sitting configuration, a VTOL airplane can also be designed to sit in the normal attitude and to look like a conventional airplane. The feasibility of this type has been demonstrated by the Bell Aircraft light monoplane, powered by two Fairchild J-44 turbojets of 1,000-pounds thrust each. In take-off and landing, the engines are pointed downward. For normal flight they are rotated for forward thrust.

Another VTOL device is the British Rolls Royce "Flying Bedstead." This is by no means an airplane in its present configuration, but consists of a framework in which two Nene turbojets are mounted. The engines remain fixed, with vertical thrust provided by bending the jet tailpipes down through ninety degrees. A similar scheme could be applied to the Bell airplane. In all of these devices, the vertical thrust force must be located close to the center of gravity of the airplane. Control during vertical flight is provided by air bled from the compressor or by an auxiliary compressed air source.

An unconventional approach to the problem is the coleopter, the brainchild of Helmut von Zborowski, who worked in Germany and now has his own firm in France. In the coleopter the power plant and the wing are integral. The wing is annular in shape, and contains or forms part of the power plant. Several types of power plants are proposed, such as ducted turboprops, turbojets, and ramjets. In each case the lift producing surface—

(Continued on page 79)

Bell jet VTO has engines that rotate to provide downward or forward flight thrust.

McDonnell XV-1 Convertiplane takes off like a helicopter, then switches to pusher-prop.

AIRCRAFT OR CONCRETE?

The seriousness of the runway problem was pointed out not long ago by Georges Hereil, president of the French aircraft company SNCASE, in the eighth Louis Bleriot lecture before the Royal Aeronautical Society. Hereil pointed out that the 1952 French budget contained $178,080,000 for airfields and only $152,320,000 for aircraft—more money for runways than for airplanes! Hereil also told about a French portable catapult that uses compressed air to launch five planes in five minutes.

Col. John M. White, Jr., CO of the 4602d Air Intelligence Service Squadron.

They stand ready to jump on the enemy when he crashes

'Have Parachute . . . Will Travel'

The story of the AF's quiz kids and their unique mission

By Lee Klein

Associate Editor, AIR FORCE Magazine

AT TWENTY airfields scattered from Presque Isle, Me., to San Bernardino, Calif., small units of highly trained men are constantly poised for action.

If the well-known balloon goes up, they will jump aboard their airplanes and take off—not in jet bombers or in supersonic fighters, but in lumbering transports. Or they may climb aboard trucks, jeeps, or even horses.

They are linguists, communications and technical experts, intelligence specialists, and thoroughly trained parachutists.

Their job is to get to a shot-down enemy bomber, capture any survivors, and pump them for information. Enemy equipment and troops have always been a prime source of intelligence information and these specialists have been trained to collect it. They won't have to make nocturnal raids into enemy territory to find their quarry. If a war starts, enemy bombers and crews will probably be downed within our borders by anti-aircraft fire, fighters, or mechanical failure.

These men, who could very well be the first to come face to face with the enemy, make up the 4602d Air Intelligence Service Squadron, a little-known unit of our Continental Air Defense Command, with headquarters at Peterson Field, near Colorado Springs, Colo.

As soon as you step inside the pale-

(Continued on following page)

T/Sgt. Johnie Britton checks his team's equipment before taking off for a practice jump.

Just before jumping, Britton takes a last minute look at his "stick."

green, one-story, temporary building that houses the unit, you get a clue that it's unique. It's an intangible something in the attitude of the men you talk with. It's in the neat, sharply creased fatigues and spit-and-polished paratroop boots they wear.

And the mission is unique. The men aren't commandos, even though they know commando techniques. They won't penetrate enemy territory to capture prisoners and equipment, but will wait for it to drop out of the skies. For the first time in our military history, we need men specially trained to find downed enemy flyers within our borders. They have to be fast. Minutes may spell the difference between survival and annihilation. They may find a code book, so we can intercept enemy messages. Or a new system of navigation and a clue to

Snowshoe hikes in the mountains teach the teams how to travel in deep snow.

methods of countering it. Perhaps they will uncover soft spots in enemy equipment or tactics. They will comb the wreckage, inspecting and evaluating equipment, and they will take pictures. They will interrogate any survivors in an attempt at gaining information about the size of the attack, the number of planes involved and targets marked for attack. Whatever they find, they will radio to their headquarters. From there, the information will be forwarded to the appropriate commands.

Some may argue that this information will do us little good as we sit stunned amidst the ashes of our great cities. It is probably true that the information would be too late to save the first targets. But we must assume that the enemy won't shoot his wad on the first raid. Any information that will make our defense more effective will justify the existence of the 4602d.

When the planners decided to establish the 4602d three years ago, they picked Col. John M. White, Jr., to boss it. He was a natural for the job—in Korea he organized and led a similar air intelligence unit. White's immediate superior is Brig. Gen. Woodbury M. Burgess, Deputy Chief of Staff, Intelligence, of the Continental Air Defense Command.

Colonel White, an amiable man with a vise-like grip, is not a chair-borne CO. He still walks with a slight limp—the result of a left leg broken several months ago while jumping at Fort Benning, Ga. In spite of a slight list to port, White propels his short, stocky frame around headquarters at a pace that leaves most visitors several steps behind. If he will pardon the comparison, the picture you recall is vaguely like that of a friendly but impatient dog who keeps glancing back to see if you are still with him.

White was a combat infantry officer and a Japanese interpreter before he switched to the Air Force. He is thirty-eight years old and hails from Seattle, where he did a little wrestling for the University of Washington.

The colonel is intensely proud of his specialists. He talks about his "airmen of the month" with an almost paternal pride. The men seem to sense this feeling, and it is reflected in their serious attitude toward their jobs. In the Navy, we would have called Colonel White a man who runs a "tight ship."

Officially, the 4602d is "charged with rapid wartime exploitation and field analysis of downed enemy equipment and uniformed personnel within the boundaries of our country."

Skeletons of crashed airplanes are used by the AISS teams for realistic practice missions.

'HAVE PARACHUTE . . . WILL TRAVEL'—CONTINUED

This "exploitation and field analysis" will normally be done by a three-man team. Each man has a specific job. Only one is an officer. One is a trained linguist, one a skilled technician, and the third an intelligence operations man. However, the 4602d constantly cross-trains its men, and White says that he now has several "triple-threat" men who can do all three.

Besides all this, the men learn how to handle horses and mules, they practice mountain and rock climbing, skiing and snowshoeing, and they are among the few parachutists in the Air Force. Each has gone through a rough Air Force survival school and knows how to stay alive in rugged terrain under adverse conditions.

Probably the most glamorous part of their job is the jumping. But Colonel White brings it into proper perspective. "Jumping is just a means of transportation," he says. "If the team can get to a crash fastest by air, they will jump. Otherwise, they might use trucks or horses." White also stresses the fact that the men are basically intelligence specialists. "We pick our men for intelligence work and then train them to jump," he says.

When a man volunteers for jump training—and only volunteers become jumpers—he is physically and psychologically conditioned in the squadron before facing the exacting requirements at Fort Benning, Ga. The Army jump school at Benning is a rough one—and only the best finish the course.

For this reason, Colonel White sees to it that his prospective jumpers get a thorough pre-Benning conditioning. In this way, "they know what to expect when they get there, and it doesn't throw them," he says.

As part of the conditioning, a mock-up of the aft end of a C-47, complete with static line and open doorway, has been built at Pete Field. Practicing standard plane exits from the raised mock-up, both trainees and experienced jumpers sweat out the razor crease in their fatigues.

The jump commands are barked by a stern non-com. "Get ready . . . stand up . . . hook up . . . check your equipment . . . sound-off for equipment check . . . shuffle and stand in the door . . . Go!"

The non-com watches every move. The punishment for a wrong one is a series of push-ups. Only rarely can a man complete one jump without stopping for push-ups.

The men don't pretend to enjoy it, but it is good training and they understand its purpose. And it pays off.

In rugged country, horses and mules might afford the only means of transportation to a downed enemy plane, so the teams are taught how to handle them.

White says that AISS men are highly rated at the paratroop school and their washout rate is lower than for other groups of trainees.

All of the training is not conducted quite so close to the ground. After a man has won his badge, he jumps frequently. To earn his incentive pay, a man has to jump only four times a

(Continued on following page)

Here's What You Can Do

The cooperation of the private citizen is important to the effectiveness of the squadron. Here's what the squadron would like from you.

If you have knowledge of a crashed enemy plane or downed enemy aircrewmen, report immediately to one of the following:

- **Nearest law enforcement agency.**
- **Nearest Civil Defense official.**
- **Nearest Ground Observer Corps post or Filter Center.**
- **Nearest Air Force Base or other military installation—report either to the Intelligence Officer, Duty Officer, or Provost Marshal.**
- **Nearest 4602d Air Intelligence Service Squadron unit.**

Law enforcement officers who have knowledge of the crash should report all information immediately to:

- **The FBI, in accordance with existing agreements.**
- **The nearest unit of the 4602d AISS.**

Here's what the AISS wants to know:

- **Location of crash—distance and direction from a landmark or town.**
- **Time and date of crash or sighting of crash.**
- **Name, address, and telephone number of the person or persons who can guide military personnel to the scene.**
- **Type of aircraft (propeller or jet, number of engines).**
- **Condition of aircraft (extent of damage).**
- **Fate of the crew—number captured, physical condition, place where prisoners are being held and name, address and phone number of person in charge. Number of dead crewmen and location of bodies.**

Reports should be made immediately and should be as complete as possible, but the report should not be delayed if all of the desired information is not available.

At the scene of the crash, law enforcement officers or military personnel should take charge of and guard the downed aircraft and all equipment and documents. They should prevent the removal of any items until relieved of responsibility by authorized personnel. They should detain crew members under strict guard and prevent the destruction of equipment, papers, or documents. Only authorized persons should be allowed contact with prisoners and their personal effects.

year, but White's aces jump much oftener. Their attitude can be summed up in the half-joking remark heard during a recent exercise at Pete Field. The wind had increased to the point where a practice jump was a bit risky, and for about fifteen minutes the big C-47 circled the area until it was safe to jump. When it appeared that the teams would return without jumping, one man said, "I hope we jump. Landing in a plane scares me."

In practice jumps, the men go out in three-man "sticks." They follow each other at intervals of only one second to land closely together. The parachute they use—the E-1—is designed specifically for spot-jumping. It is steered by pulling a guide line, spilling air through special slots in the canopy. By pulling the guide lines, a jumper can face in any direction, giving him quite a bit of control over where he lands—an important factor in jumping over rugged, wooded country.

The 4602d has a good jump record—only one man has been seriously injured so far. That was when the assistant operations officer, Maj. Joseph A. Cybulski, broke his right hip last summer when a tricky wind hit him and "the bottom dropped out" just before he landed. He now carries around, as permanent equipment, a five-inch pin, a six-inch side plate, and four three-inch screws. He wants to continue jumping and has talked the medics into letting him try a jump into water to see if the opening jolt will affect all this hardware.

The squadron's only fatality was suffered on a mountain-climbing and hiking trip into the Rockies west of Colorado Springs. One man lost his footing in "scree"—a gravel-like debris found in mountain areas—and dropped off the edge of a twenty-foot cliff. Scree is treacherous to climb or descend in and a special knee-locking technique has been developed for walking in it.

Rappelling is one of the many mountain-climbing skills required of AISS teams.

It is no surprise that Russian is the only language stressed among the linguists on the team. Some acquired their language skill naturally, through foreign birth, and others picked it up while living abroad. The other linguists have attended either the AF Russian school at Syracuse University, N. Y., the Army Language school at Monterey, Calif., or the squadron's own Russian school. To keep in practice, they speak Russian as they perform their daily duties. Their language facility reflects the high intelligence level of the squadron members. White can count among his men at least one Ph.D., several who have their masters' degrees, and career airmen who are naturally well-equipped for the intelligence mission.

The intelligence member of each team is taught at the Air Training Command's intelligence school at Sheppard AFB, Tex., and the technicians are trained to evaluate guns, engines, and electronic gear at Wright-Patterson AFB, Ohio. All of the men must be able to send and receive Morse code at a speed of at least five words a minute.

They are taught how to get around in mountains and deep snow at the Army's Camp Hale, high in the Rockies. At Fort Carson, near Colorado Springs, they are schooled in the ways of horses and mules. It's a safe bet that this is the AF's only cavalry outfit, even if only part-time.

The mountains west of Colorado Springs give the men a place to practice and keep a razor edge on skills. To make training more realistic, they utilize the skeletons of planes that have bashed into the mountains. And they are frequently called on by civil agencies to assist in rescue missions.

Last winter, for example, three college students from Denver went mountain climbing into the Crestone Needles area, near Westcliffe, Colo. The three were trapped in a crevasse and the 4602d was called to assist in the rescue.

T/Sgt. Johnie Britton took part in that rescue. Typical of the men who volunteer for duty in AISS, thirty-year-old Britton is serious and quiet, and he talks with a slight Oklahoma drawl. At Wright-Patterson AFB he learned the skills required to become a technical intelligence member of the team. He came to the 4602d in an unorthodox way. He started his military career as a Navy quartermaster during World War II and studied engineering at Oklahoma A&M for two years before joining the Air Force in 1947. One of the more experienced jumpers in the squadron, Britton has hit the silk close to a hundred times.

Discussing the rescue of the trapped climbers, Britton explained that one of them had violated a rule that is SOP with all mountain climbers—he used someone else's piton. (These are the metal pins that are driven into the rocks to assist in scaling sheer walls. Britton says that a climber should never use an old one that he may find in areas that are climbed frequently, regardless of how secure it may appear.) When the climber slipped, the strain proved too great for the old pin and it pulled out, dropping him 120 feet into a crevasse. He was wedged in, his two companions went to his rescue and became trapped themselves. All were pulled out after nearly three days, miraculously not seriously injured.

Security poses the usual dilemma for the squadron. Much of its work by nature demands a secret classification. On the other hand, the squadron can accomplish its mission easier if the private citizen realizes what it is trying to do. For example, the squadron couldn't possibly maintain all of the equipment that it would need in an emergency. Communities and private firms near bases where units of the squadron are stationed have cooperated by making trucks, horses, and supplies available if they should ever be needed. Only recently, the Association of American Railroads made its sprawling communications network available to the 4602d. This means that any place in the US where a squadron member sees a train, or a railroad crew, he can forward information to his headquarters.

Units of the squadron work closely with FBI offices, but the men are "in no way connected with either covert collection activities or the internal security aspect of national defense," according to an official brochure. It points out that the squadron is not "in conflict with, a substitute for, or an abrogation of FBI responsibilities and relationships with local law enforcement agencies."

With all of their skill in making technical investigations, interrogating prisoners, and translating foreign documents, the men of the 4602d can only be effective if they can get to an enemy crash in a hurry. Like all units of our Continental Air Defense Command, the teams stand a round-the-clock alert. If the enemy comes, they will be ready. But a lot can depend on you, as a private citizen. —END

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Today there are more F-86D Sabre Jets flying on active duty than all other interceptor-types combined. North American Sabre Jets are the winged backbone of our nation's continental defense system and the defense system of many of our allies throughout the world. Day or night, fair weather or foul . . . F-86D's are ever alert to intercept any possible invader.

The "D" was the Air Force's first one-man all-weather interceptor. Capable of 650 m.p.h. plus speeds, it carries 24 Mighty Mouse rockets, each able to destroy any known type of bomber.

Latest in North American's famous Sabre family is the new F-86K, cannon-armed sister of the F-86D, which is now in production and will soon join NATO forces in Europe's air defense. Both the "D" and "K" are prime examples of North American Aviation's unsurpassed ability to design and produce the planes to meet America's defense needs.

Research and development keep North American foremost in aircraft, rocket engines, guided missiles, electronics and peaceful applications of atomic energy.

ENGINEERING AHEAD FOR A BETTER TOMORROW

NORTH AMERICAN AVIATION, INC.

New USAF—G.E. maintenance techniques give F-86D's

30% INCREASED AVAILABILITY

At Hamilton AFB, California, special jet engine maintenance crews cut 325th FIS operating costs, manpower requirements

The Air Force's 325th Fighter Interceptor Squadron now has a *30% higher North American Aviation F-86D "in commission" rate* and its maintenance costs and manpower needs have been reduced. These benefits are a direct result of entirely new J47 engine maintenance procedures initiated by personnel of the 325th and G-E jet service engineers.

ONE USAF MAINTENANCE CREW, for example, now handles the squadron's J47 engine removal and replacement work. Previously, many F-86D crews were used for this job. But the new "special" crew—besides reducing manpower requirements—has cut engine removal time to as low as 30 minutes!

A SPECIALIZED 7-MAN RUN-UP CREW also handles engine testing for all squadron aircraft after the F-86D's have been reassembled following inspection. Before, 20 men handled all squadron run-ups.

Savings realized by the 325th are but another example of how G-E jet service engineers are constantly co-operating with the Air Force. To G-E jet representatives in the field—increased aircraft availability and reduced jet engine maintenance time are prime objectives. 232-8

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GENERAL ELECTRIC

1. HAMILTON AFB MAINTENANCE SYSTEM IN OPERATION. In this typical case history, a G-E J47 is removed for routine check. Trouble is suspected. Engine sent to test . . .

2. J47 CELL TEST indicates a need for further check of the control system. So G-E tech reps (above) recommend an electronic engine simulator test . . .

3. SIMULATOR EQUIPMENT evaluates the J47's integrated electronic control operation, finds a compressor discharge pressure sensor unit to be out of tolerance . . .

4. NEW CDP SENSOR, picked up at the Squadron's spare parts stock room, will be installed to complete engine minor repair, ready J47 for reinstallation . . .

5. FINAL TESTING. A special seven-man run-up crew checks J47 out in F-86D. By using a single crew for all J47 run-ups, the 325th Fighter Interceptor Squadron at Hamilton has reduced the number of personnel required for run-ups by two-thirds.

A delegate to the Arnold Air Society's National Conclave sounds off at a business session in Washington's Statler.

ARNOLD AIR SOCIETY MEETS IN WASHINGTON

MORE than 800 Air Force ROTC cadets representing 166 squadrons of the Arnold Air Society gathered in Washington in April for the Society's sixth national conclave. The University of Maryland's Frank P. Lahm Squadron was host. Under the Society's system of rotating national headquarters each year, Maryland succeeded the University of Omaha as headquarters school. New national officers, all from the University of Maryland, are Gib Petrina, Commander; Paul Lambrides, Executive Officer; Ray Curtiss, Operations Officer; William Hoffmeyer, Adjutant-Recorder; and David Forward, Comptroller. Outgoing officers, all from the University of Omaha, were Larry Peters, John Dubois, John Cottrell, Melvin Rousek, and Chris Crowder. The Arnold Air Society is the national honorary society for advance AFROTC cadets and is affiliated with the Air Force Association.—END

John I. Lerom, Deputy Assistant Secretary of the Air Force, with outgoing National Commander Larry Peters, center, and his successor, Gib Petrina.

Spar sets sail for Europe

Bendix-International recently took delivery of its first SPAR, the low-cost portable GCA radar. The equipment went directly from Laboratory for Electronics' test field at Norwood, Mass., above, to foreign markets for demonstration before fourteen interested European governments.

The United States Air Force has already taken delivery of its order of SPAR units and recently completed tests of the equipment under arctic conditions at Ladd Field, Alaska.

This should be ample proof that SPAR, the original portable GCA and the only lightweight approach radar designed to satisfy the rigid requirements of the U. S. Air Force, is also the only tested, safe and foolproof equipment of its kind on the market.

Laboratory for Electronics is proud that it pioneered this concept of approach radar and developed the *original* light weight, portable GCA unit. If you place your order today, you can expect delivery in as little as twelve weeks.

Creative developments in the field of electronics

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1955 Convention Hotel Reservations

Watch for details about AFA's first annual golf tournament—August 9.

BY THE time this notice appears, room and suite accommodations at three of AFA's twelve convention hotels—Fairmont, Mark Hopkins, and Huntington—will be "sold out." This is an indication of the advance interest in the 1955 AFA Convention. Nearly 350 rooms and 70 suites have been confirmed at just three convention hotels—an unprecedented situation. If, upon reading this, you still feel like taking a chance on getting a canceled room at the Fairmont or Mark Hopkins, be sure to list a second choice of hotels. Cancellations will be scarce. Send all requests to: AFA Housing Bureau, 61 Grove Street, San Francisco. Include a $10 deposit per room.

AFA HOTELS AND ROOM RATES

HOTEL	SINGLE	DOUBLE	TWIN
Fairmont	SOLD OUT	SOLD OUT	SOLD OUT
Mark Hopkins	SOLD OUT	SOLD OUT	SOLD OUT
Huntington	SOLD OUT	SOLD OUT	SOLD OUT
Sheraton-Palace	$8.00-13.00	$10.00-15.00	$12.00-17.00
Sir Francis Drake	9.50-13.50	11.50-15.50	13.00-19.50
St. Francis	8.00-18.00	10.00-15.00	13.00-20.00
Clift	8.00-12.00	10.00-15.00	10.00-18.00
Chancellor	5.50	7.50	8.50
Plaza	5.00- 7.00	7.00- 8.50	8.00-10.00
Stewart	4.50- 7.00	6.00- 8.00	7.00-12.00
Richelieu	4.50- 6.00		8.00- 9.00
Whitcomb	5.00- 9.00	7.00-12.00	8.00-12.00

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FIRST CHOICE SECOND CHOICE

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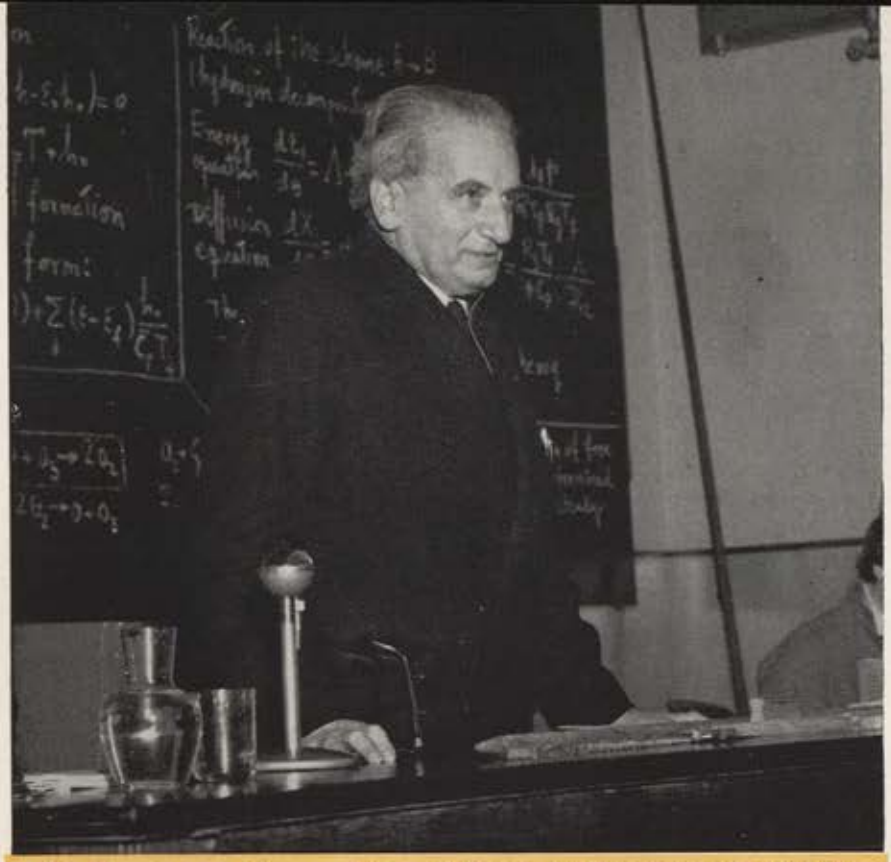

Dr. Theodore von Karman, "Dean of Aeronautical Scientists," headed the original Scientific Advisory Group, now is Chairman Emeritus. He also heads NATO's Advisory Group for Aeronautical Research and Development.

Hap Arnold's Brain Child

USAF Scientific Advisory Board

Arnold wasn't afraid to use brains, wherever he found them—whether in uniform or not. And it's paid off.

ON September 8, 1944, the first German V-2 was launched from Holland against London, and fell on suburban Chiswick. A few seconds later the second V-2 smashed into Epping, also outside London. Soon thereafter, a report on the operational use of the V-2 was placed on the desk of the late General of the Air Force H. H. "Hap" Arnold.

The event had been long anticipated, for Allied Intelligence experts had obtained information which had sent Allied bombers to the German rocket station at Peenemünde more than a year before. Now, however, the Nazis were launching V-2s which could not be shot down, as could the earlier V-1 "buzzbombs."

As he gazed out over the Potomac River basin, "Hap" Arnold thought of the summer before, when Air Corps engineering officers had been told by the country's leading manufacturer of conventional aircraft engines that jet propulsion was "a passing fancy."

Arnold's mind went back to the summer of 1941, when the Air Corps Engineering Division at Wright Field undertook work on jet propulsion only after he personally ordered the Whittle jet engine shipped from England to Wright Field.

Arnold further remembered mid-1938, when he had asked the National Academy of Science to establish a committee for Air Corps research. When the scientists asked him what problems he wished them to work on, Arnold replied: "De-icing of windshields, and rocket-assisted take-off for bombers." A large Eastern university volunteered to de-ice Air Corps windshields, but the scientists suggested that one of their number, Dr. Theodore von Karman, then Di-

There are few areas of scientific inquiry which do not come under the SAB's scrutiny, a tribute to the farsightedness of General Arnold

By T. F. Walkowicz

rector of the Guggenheim School of Aeronautics at the California Institute of Technology, take on "the 'Buck Rogers' stuff."

There are two ways of winning a war—by overwhelming the enemy, or by out-smarting him. It was then clear to Arnold that the Germans were almost overwhelmed, that their vengeance weapons had become operational too late to turn the massive tide of Allied power. But why, thought Arnold, should American industrialists, military engineers, and civilian scientists be so slow to grasp the impact of new scientific discoveries?

Arnold was then aware of the Manhattan District, and was anticipating the advent of the A-bomb. And intercontinental rockets and A-bombs added together would not leave the United States enough time to mobilize and overwhelm the enemy again if World War III should come.

Arnold searched out the scientist who, in 1938, was willing to take on "the 'Buck Rogers' stuff." By mid-November 1944 there was assembled in the Pentagon, under von Karman's direction, a group of some three dozen leading American scientists from every field of science having a bearing on airpower. General Arnold himself, in his book, *Global Mission,* best states the task he assigned to the AAF Scientific Advisory Group:

"I told these scientists that I wanted them to think ahead twenty years. They were to forget the past; regard the equipment now available only as the basis for their boldest predictions. I wanted them to think about supersonic speed airplanes, airplanes that would move and operate without crews; improvements in bombs, so that we could use smaller bombs to get greater effect; defenses against modern and future aircraft; communication systems between airplanes and the ground, and between the airplanes themselves in the air; television, weather, medical research; atomic energy, and any other phase of aviation which might affect the development . . . of the airpower to come.

"I assured Dr. von Karman I wasn't interested in when he submitted his report. He was to go ahead, wherever he wanted and whenever he wanted; to pay no attention to tomorrow's airplane, or the day-after-tomorrow's airplane, but to look into the future twenty years and determine what we would have to have then, and make a report that would be a guide to the commanders of the Air Force who would follow me."

Thus began the work of the lineal ancestor of today's USAF Scientific Advisory Board which, in its advisory capacity to the Chief of Staff, continues to help shape the Air Force, not only of tomorrow but of years to come.

Von Karman and his colleagues worked hard during 1945, assessing the American position in the then rapidly unfolding revolution in the aeronautical sciences. Their first report was a slender volume called *Where We Stand,* which compared the American position in several critical areas with that of the Germans, Japanese, British, and the Soviets. After General Arnold's unfortunate heart attack in late 1945, the group quickly brought its work to a close, submitting a thirty-odd-volume series, entitled *Toward New Horizons.* The summary volume, *Science: Key to Air Supremacy,* was a blueprint for the Air Force's development, a glimpse at the distant vistas of technological opportunity and operational responsibility which lay ahead for airpower.

In a very real sense, this report was a product of the intimate friendship, confidence and mutual respect between the soldier and the scientist: Arnold and von Karman. Each explored the other's mind, and their associates left behind a legacy of imaginative, yet scientifically sound, planning to help insure the qualitative supremacy of American airpower.

Arnold's directive was broad; he did not ask von Karman to limit his group to questions of hardware. Rather, he wanted its considered judgment on all questions of basic importance to the quality of airpower: the research and development program; technical personnel policies; research and development budgets; test and evaluation facilities; and organization of the research and development effort. It is in terms of this broad directive that the SAB has operated over the years, with emphasis changing from time to time on these various factors, as dictated by AF needs of the moment.

A glance at the structure and membership of the Scientific Advisory Board (see pages 52 and 53) indicates the range and scope of its activities, as well as the caliber of its membership. Some members volunteer their services, at no expense to the government. Others get the standard consultant's fee of $50 a day, usually a fraction of what their services are worth on the open market.

The Scientific Advisory Board is a hard-working group. Twice a year the entire membership meets, usually at an Air Force research and develop-

(Continued on page 54)

THE USAF SCIENTIFIC

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These sixty-four men currently make up the USAF's Scientific Advisory Board, headed by Dr. Mervin J. Kelly. All except the ex-officio members serve on at least one of the nine panels. The chairmen of the various panels appear at the right side of the top line of the photochart above.

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ment installation. A meeting is ordinarily scheduled for a Monday, Tuesday, and Wednesday, but the preceding weekend is usually taken up by preliminary meetings of the individual panels. Sessions often run far into the night, yet all may rise at dawn to catch an airplane so they can observe a missile launching or a firepower demonstration. As an example of how seriously Board members take their work, Dr. Edward Teller, who is credited with the scientific breakthrough that led to the H-bomb, once managed to make it to a meeting at Maxwell AFB, Ala., even though a B-25 had to whisk him back to Las Vegas very early the next day for a nuclear weapons test.

It is difficult to set down precisely the contributions of a group whose primary mission is to think about highly classified matters. However, in the case of the Scientific Advisory Board, General Arnold's original directive has borne fruit in these—among many other—basic ways:

- The establishment of the Air Force Institute of Technology at Wright-Patterson AFB, Ohio, and the initiation of a broad program of postgraduate studies at civilian universities, which insure for the Air Force a continuing supply of technically trained officers.
- The Arnold Engineering Development Center at Tullahoma, Tenn.

Four of the seven AFA Science Trophy winners since the award was inaugurated in 1948 have been SAB members. These include the 1952 winner, above, Dr. Edward Teller, here accepting his trophy from AFA's Jimmy Doolittle. The other winners were Dr. Theodore von Karman (1950), Dr. George E. Valley (1951), and Dr. Mervin J. Kelly, now Scientific Advisory Board Chairman, in 1953.

(AIR FORCE, September '54), geared to the supersonic era and giving the Air Force test facilities to evaluate aircraft, missiles, and engines developed for it by American industry.

- The creation of the Air Research and Development Command and the office of the Deputy Chief of Staff, Development, on the Air Staff, to give the research and development function management and organizational capabilities commensurate with its importance.
- The Board's greatest contribution—a sound, far-seeing, realistic program of continuous research and development, aimed at keeping America supreme in the air.

The results of this continuous research and development program have been manifold, and only a few of these can be mentioned here in general terms:

- The intercontinental ballistic missile program, which grew out of the original Scientific Advisory Group's study of German research in the field.
- The air defense program, which got its first impetus from an Scientific Advisory Board member, Dr. George Valley, of Massachusetts Institute of Technology. Valley's ideas led to the formation of an Air Defense Systems Engineering Committee (ADSEC) shortly after the first Soviet A-bomb was set off in 1949. In turn, the work of this Committee led to formation of the M.I.T.-Lincoln Air Defense Laboratory.
- Project Vista, which studied tactical air-atomic warfare and the atomic defense of Western Europe.
- Project East River, which studied civil defense problems.

And there have been many others whose secret nature does not permit public discussion.

The work of the Scientific Advisory Board has not always been easy. For four long years after World War II, the US hoped against hope for peace, while the Soviet design for world conquest became each day more clear. Only USAF strategic air-atomic power prevented a vast Communist sweep into the post-war vacuum of poverty and destruction Under these circumstances, every possible cent of the Air Force's slim resources of that period went into the retaliatory capability of the Strategic Air Command. Qualitatively, the Air Force faced the danger of slow deterioration, for it is difficult to accept the recommendations of a Scientific Advisory Board when the funds required to implement them are inadequate.

The tide turned during the summer of 1949, when the late Gen. Hoyt S. Vandenberg asked Dr. von Karman for an over-all study of air research and development activities. This request resulted in the now historic Ridenour - Doolittle Report, which called for a major overhaul in Air Force thinking—no longer are mere numbers of aircraft sufficient, said the report; their performance must reflect the latest advances in science and technology. The research and development function was advanced in stature, to enable it to fight more effectively for the resources—people, money, and facilities—required to do the job; and R&D was given its own organizational integrity as a co-equal and equally important member of the Air Force development-production team.

This new concept gained acceptance only slowly at first—until the Communists moved in Korea; and only one airplane, the North American F-86, equipped with a swept-back wing conceived in Germany, swung the qualitative balance in favor of the US.

Out of this kind of "trial by fire and narrow escapes," the USAF-SAB partnership has grown only stronger, warmer, and more effective.

Since General Arnold's days, a succession of USAF Chiefs of Staff—Spaatz, Vandenberg, and now Twining—have supported the SAB and seen airpower benefit from its work. Dr. von Karman is no longer at the helm, having resigned and accepted the title of Chairman Emeritus. The Board's full-time direction has now fallen to Dr. Mervin J. Kelly, President of the Bell Telephone Laboratories, supported by Mr. James H. Doolittle, whose many accomplishments enable him to speak to the Air Force as General Doolittle and to the scientists as Doctor Doolittle. And the roster of the Board's Military Directors includes some of the outstanding operational and technical generals —LeMay, "Bim" Wilson, "Fritz" Glantzberg, "Bill" Craigie, and "Don" Putt.

Out of the work of all of these men—soldiers and scientists alike—the Board has become unique in the military structure of the nation. No other service has an exact counterpart. It pretends neither to omniscience nor to omnipotence. Its contributions to the security of this nation are already almost beyond measure. Its future potential is limited, as in the past, only by the wisdom and understanding of its members and that of the military men with whom it works. —END

A story of survival in a Korean wilderness—part one

Hell is a cold place

No one but the Chinese saw the T-6 crash into the Korean mountainside. And an incredible tale begins . . .

By Clay Blair, Jr.

CLINTON D. Summersill, a twenty-four-year-old Air Force fighter pilot, was stationed in Itazuke, Japan, when the war in Korea broke out in June 1950. He was a stocky, happy-go-lucky bachelor, who flew F-80 jets and liked to pass his off-duty time in bars and night clubs. His blond hair was usually unkempt, and he was never without a cigar, the modern-day hallmark of the tiger. He was very friendly, anxious to get along with his fellow officers, and could tell an anecdote or story in a winning way. He had resigned himself to the belief that he would be killed while flying an airplane—or so he said—and spent all of his pay every month, chanting melodramatically, "Eat, drink, and be merry, for tomorrow we die."

Summersill—"Clem" to his friends—was from Penny Farms, Fla., an unusual little town since it was the home of about 250 retired ministers. Summersill's father was manager of a dairy farm that served the ministers and their families. Both he and his wife were very religious, and they raised their five children to serve God and country. Clem was the middle child, having two older brothers, both of whom served in World War II, and two younger sisters. He went to high school in Green Cove Springs, Fla., eight miles from home, and played second-string football. He did not particularly like the atmosphere in Penny Farms.

Summersill's great interest in life was flying. It began one day when a friend of his father's took him for his first ride in a Piper Cub. From that day forward, Summersill determined to spend his life in the air. He urged his father to allow him to take flying lessons. The request was denied, but only because the Summersill family could not afford the expense. Clem was not thwarted; he hung around the nearby airfield and hitch-hiked rides whenever he could. From time to time he was allowed to take the controls.

He read every book, magazine article, and newspaper story he could lay his hands on that dealt with aviation. Finally he made up his mind that he would join the Air Force.

In 1943, after graduating from high school, Summersill applied for admission to the aviation-cadet program. The rolls were temporarily full, so he entered the Air Force as an enlisted man to wait for a vacancy. He waited through 1944 and 1945, working in the meantime as a drill instructor at Air Force bases in Texas and Wisconsin. To his great disappointment, the war ended before he was called to flying school. Believing he might be more readily selected for the cadet program if he had higher education, he left the Air Force in the fall of 1945, to go to college.

Two and a half years at the University of Florida at Gainesville did not turn his head. Summersill was still haunted by his love of flying. He reapplied for the cadet program and was stunned to discover that he could not

(Continued on following page)

About the Author

This article is taken from a new book, Beyond Courage, *by Clay Blair, Jr., Pentagon correspondent for* Time *and* Life. *Published May 16 by David McKay Co., the book contains four survival stories from Korea. The book's foreword, by Gen. Nathan F. Twining, USAF Chief of Staff, is reprinted on the next nage. Mr. Blair has written two other books—*The Atomic Submarine and Admiral Rickover, *and (with James Shepley,* Time's *Washington bureau chief)* The Hydrogen Bomb. *Born in Lexington, Va., in 1925, he served aboard submarines in World War II. He attended Tulane and Columbia Universities and joined* Time *in 1948. He's married and has four children.*

A Word from General Twining

Below is General Twining's foreword to Beyond Courage. *This material as well as the accompanying article from Mr. Blair's new book is copyrighted by the publisher, David McKay Co., and is reprinted here with permission.*

Our nation has shown an intense interest in the fate of the Air Force officers and crewmen who became POWs in the Korean war. Tens of thousands of words, in news stories, editorials, magazine articles, and books, have been written about them. We in the Air Force have rather silently observed this attention come into focus. The accounts of how Air Force POWs were murdered, beaten, starved, tortured, thrown into dismal solitary confinement for months, and falsely charged with "germ warfare," provide new and vivid proof, if further proof is needed, of the evil, barbaric, and poisoned nature of Communism. For us it has been a bitter experience, but because of it, we can better equip ourselves to cope with this sort of thing in the future.

However, I believe that in all the words written a salient point has become somewhat obscured. It is the duty of every Air Force pilot or crewman who falls behind enemy lines to attempt to escape. In North Korea our men found this to be very difficult. The narrow peninsula held hundreds of thousands of enemy troops and Communist political agents. Climatic conditions, especially the bitter winters, and rugged terrain did not make for easy cross-country movement. Food and clothing were scarce. North Korean civilians were exceedingly reluctant to risk their lives aiding Americans. Particularly was this true after the Chinese Communists entered the conflict. There were almost no underground escape channels as in Europe in World War II. Worst of all, in a land of Orientals, a Caucasian was easily spotted. Daytime movement was almost impossible.

In spite of the odds, a small number of downed Air Force pilots did succeed in avoiding capture and in one manner or another made their way back through the bamboo curtain to safety. Their exploits form a most fascinating and dramatic chapter of the Korean war. Here were the men of the Air Force out of their element, called upon to play strange and daring roles in a hostile land. For these men the chips were down, the stakes high, the results freedom, torture, or death. Previous training in the art of survival and the techniques of escape and evasion was vital to success. But there came a time when training could help no more, and only sheer courage, determination, and ingenuity enabled men to carry on.

Because it was necessary to protect escape techniques, routes, and the few faithful North Koreans who lent assistance, the majority of these stories remained untold during the war.

Now that many of them may be related safely, with minor omissions to protect our friends, the Air Force is grateful to Mr. Clay Blair, Jr., for his interest and devotion in shaping these accounts into a permanent record of courage.

I believe all fellow airmen and freedom-loving people everywhere will find in these stories a message of inspiration and faith in the moral, mental, and physical fiber of our combat air crews. I am proud that the American youth of today who patrol the skies against a ruthless enemy are the same breed of men who have defended the ramparts of freedom throughout our history. It is an honor to serve with them.

General N. F. Twining
Chief of Staff, United States Air Force

HELL IS A COLD PLACE——CONTINUED

pass the physical examination—his eyes had weakened. With this bad news, Summersill then went back into the Air Force in the only way he could—as a radio technician. Later, his eyes improved, and he was accepted for pilot training; and in 1948, after a five-year delay, Summersill arrived at Randolph Field, Tex., the "West Point of the Air." A year later, a hot-shot fighter jockey, he was sent to Japan.

From the day the North Koreans marched into South Korea, and the Air Force was alerted for action, Summersill itched to get into the fight. But bad luck plagued him. First he was transferred out of his jet unit, because his proficiency had dropped. Then he was assigned to a ground job. Weeks later, he wormed his way back onto flying status, but the best he could get was a job flying big C-119 and C-54 cargo planes between Japan and Korea, hardly a satisfying way of life for a fighter pilot when a war was going on practically under his nose. Summersill kept his eye peeled for any kind of assignment that would put him into the fight.

His chance came in late December, when a job in the 6147th Tactical Squadron opened up. The 6147th was a special Air Force unit that flew small "Mosquito" aircraft along the front lines and directed close-support aircraft to ground targets. The planes—T-6s—were old single-engine, trainer-type aircraft that had been left over from World War II. They had room for a pilot and an observer and carried smoke rockets that were used to mark the ground targets. They were equipped with radios, so that the pilot could talk to the ground units and to the fighter-bombers, though most of the electronic equipment was worn out. But to Summersill, even this kind of combat flying seemed superior to flying transports.

By the time Summersill arrived in Korea, the war situation had gone from bad to good to bad again. Gen. Walton Walker and his successor, Gen. Matthew Ridgway, had rallied the Eighth Army and temporarily stopped the retreat after the initial Chinese attack had driven the UN forces back below the thirty-eighth parallel. But the Chinese were still pressing. They had launched another attack and had driven the Eighth Army even farther back down into South Korea below the Han River and were threatening to drive a wedge down through the center of the UN line and capture Pusan.

Most of the ground divisions had suffered heavy casualties. The men were exhausted, having been without adequate food and sleep for weeks. To stop the oncoming hordes of Chinese and North Korean soldiers, airpower was in greater demand than ever. Mosquito aircraft were particularly needed. Consequently, pilots of the 6147th flew two and sometimes three missions a day, remaining over enemy territory as much as six or eight hours. Mechanics worked around the clock to keep the battered aircraft in halfway-decent flying condition.

When Summersill joined the 6147th, he set up quarters in a tent and was soon winging his way in the "putt-putt" over the cold, rugged countryside. He had his troubles. He did not have proper winter flying clothing. His fleece-lined boots were sizes too large, and he could not fly the airplane while wearing them. He kept them stored in the baggage compartment and flew with only his paratrooper boots. The result was that his feet were numb when he returned from each flight. An hour and a half was required to thaw them.

But worse than the cold was the worry of crashing behind enemy lines. Summersill learned soon that the Chinese Communist soldiers reserved a special sort of hatred for Mosquito pilots. They had a dirty word for the Mosquito planes that, translated, meant: "The little air-

Blood flowed down over his eyes as Summersill fought his way out of the cockpit.

planes that drop the big bombs." It was the firm belief among Mosquito pilots and observers that to be shot down in enemy territory and captured meant certain death. Only one Mosquito crewman was known to have been captured alive. Presumably the Communists had shot the others on sight.

On the second day, Summersill was assigned a permanent observer, a thirty-three-year-old Army captain from the 2d Division named Wayne Sawyer. He was married and had two small girls. Prior to World War II, he had been a bush pilot in Alaska and Washington state. Before that, he had successfully created a flying paper route. He knew as much about flying a small airplane as Summersill, or perhaps even more. Certainly he was familiar with Mosquito piloting; he had flown more than 150 missions and wore three Distinguished Flying Crosses. He had crashed twice behind enemy lines, and each time escaped.

Sawyer had joined the Air Corps in 1939. In spite of his wealth of flying experience, he was washed out of the aviation cadets after failing to pass a physical examination. He transferred to the infantry and fought with the Army ground forces in Europe and the Pacific. He was fearless in combat. His nerves and voice were steady and controlled. He wore his hair in a short crew cut and kept himself in superb physical condition. Six years of combat had made him a moral, though not intensely religious, man.

On January 15, Captain Sawyer and Summersill were relaxing in their tent enjoying a day off. They had flown eighteen missions in nine days and were tired. They had just finished eating a big chicken lunch and planned to spend the afternoon and evening over a bottle of brandy. These plans were abruptly quashed when they received word from Operations that they had been assigned to fly a "fill-in" mission for a T-6 crew that had been unable to report for duty. As he pulled on his heavy winter flying suit, Summersill stared at the unopened bottle of brandy.

"Just our luck," he said to Sawyer.

The two men arrived on the flight line at 12:30 and checked the aircraft. Six smoke rockets were mounted under the wing. Summersill opened the baggage compartment and threw his big fleece-lined flying boots inside, slammed the door, and climbed up the wing into the forward cockpit. Sawyer crawled into the back cockpit and slid shut the "greenhouse" canopy. Summersill gunned the engine, and the silver plane bounced over the steel-mat taxiway to the end of the runway. Soon they were in the air and headed for the front near the thirty-seventh parallel, an hour and a half away.

At two o'clock in the afternoon, they arrived at the front and, via UHF radio, Summersill got in touch with the ground controller. The latter reported the situation: there were a large number of enemy troops facing an equally large number of UN troops—mostly ROKs—along the front. A heavy firefight had been in progress all day. Word had been received that some three to four thousand Chinese Communists had been massing about eight miles behind the lines and were preparing a breakthrough. Could the Mosquito find the enemy troop concentration and then direct fighter-bombers toward it?

"Roger, buddy," Summersill answered.

He flew the T-6 toward the area where the Chinese troops were believed to be massing. As he sped northward over no-man's land, he studied the terrain below: it was

(Continued on following page)

the roughest he had ever seen. Jagged rocks and ridges, cut by deep ravines and canyons, poked skyward. Large patches of snow lay drifted in and among huge boulders, on the floors and hillsides of the canyons. Summersill shuddered and flicked on his intercom:

"It looks like the face of the moon down there, Wayne," he said to Sawyer.

"Right, laddie," Sawyer said. He was intently searching the ridges and canyons for signs of enemy activity.

A few miles behind enemy lines, the T-6 was joined by a flight of sixteen Navy Corsairs and attack planes (ADs). The fighters called Summersill via radio and asked for targets. Summersill explained the tactical situation and told them to stand by while they sought out the mass of enemy troops. The heavily armed planes climbed to a safe altitude—beyond enemy small-arms range—and circled lazily while Summersill pointed the T-6 toward the rugged earth below to look for the Chinese.

Flying in and among the ridges and canyons required great skill and constant attention. Sawyer did most of the looking. Suddenly, he shouted over the intercom:

"There the little yellow bastards are."

Summersill banked the plane so that Sawyer could get a better view. Then once more, he dove the plane toward the ground.

Sawyer said, "Clem, they're shooting at us. We better get out of here."

Summersill had allowed the plane to descend within two hundred feet of the ground. On warning from Sawyer, he pushed the throttles to full power and banked sharply around a rocky cliff. Then Sawyer spoke again:

"Clem. The manifold pressure's dropping."

In spite of full throttle, the engine was losing power. Summersill automatically reached down and checked his fuel switches to make sure the full tanks were cut in. He turned up the carburetor heat. Still the engine did not speed up. The T-6 was losing altitude fast.

Summersill then realized he had flown into a blind, horseshoe-shaped canyon. There was no way out except to climb, or turn and glide back to the open end of the horseshoe where the Communist troops were massed. He could not climb; he dared not turn around. In an instant, he realized he would have to crash-land the T-6 on the rough floor of the canyon.

Summersill tried to glide as far from the Chinese troops as possible. But the plane dropped fast. Within seconds, he was pulling back on the stick to dodge a huge boulder. The plane slid onto a large, upward sloping granite slab and skidded along for about a hundred feet. The belly tank ripped off and tumbled down the hillside, a mass of flames. Summersill's head smashed into the foam-rubber crash pad over the instrument panel.

The plane ground to a halt just short of a large rock. Summersill looked around. He saw Sawyer unfasten his safety belt and shoulder harness and climb up on the cockpit edge. With his parachute still strapped under his seat, he leaped into the snow, just forward of the leading edge of the wing. By then, Summersill was fighting his way out of the cockpit. Blood flowed down over his eyes and blinded him.

His parachute had somehow jammed. He knew he must try to save it because it would be useful in many ways: as a distress signal, as a sleeping bag, if necessary, as a tent, or as a waterproof cover for his boots. He was struggling to free it when he heard the flames crackling, and felt the heat. He knew the plane was on fire and that he must get out quickly. From a distance, he heard Sawyer calling, "Clem. Clem. Get out. Get out."

Summersill unstrapped his parachute harness and blindly crawled out of the flaming plane. As he left the cockpit, his left arm instinctively reached for, and found, the first-aid kit. He wrenched it from the fitting, jumped down on the wing, and slid into the snow alongside Sawyer. He wiped the blood from his eyes and looked at his observer. Then, for the first time, he noticed Sawyer's left leg.

It appeared to have been amputated or broken in the crash. Summersill looked back at the plane. He believed it would blow up any second. He thought: Shall I try to save Sawyer, or shall I run away and save myself?

Sawyer broke into Summersill's split-second reverie:

"My leg's broken through the ice. It's caught down between these rocks. Help me. Hurry! We've got to get out of here before the plane blows."

Wiping the blood from his face, Summersill knelt down in the snow and pulled on Sawyer's leg. He slipped and fell. Sawyer clutched his jacket, and the two men grunted, as they fumbled in the snow.

"Get out of the parachute," Summersill said.

Sawyer clawed his way out of the parachute harness. Summersill put his knee against the parachute pack, gave a mighty pull, and fell over backward as Sawyer's leg broke free from the trap. Water dripped from his trousers and boots; the hole into which he had slipped was a frozen-over puddle. His kneecap was badly injured.

"I better get my fleece-lined boots out of the baggage compartment," Summersill said. He turned to run back to the plane. At that instant, one of the smoke flares, ignited by the heat and gasoline flames, whooshed over their heads.

"Get out of here before we are killed," Sawyer yelled. Both men got up and started running, Sawyer dragging his chute. Within a few feet, he dropped it in the snow.

"To hell with it," he said to Summersill, "we can't get it up the hillside anyway."

Summersill nodded. The two men clambered over and around the huge boulders, stumbling and sliding on the slippery shale. "Where're we going?" Summersill asked. He could hardly see. "Follow me," Sawyer said, "I think I see a good hiding place up on the side of the ridge." Soon the men were plunging through a snowdrift. Sawyer sank in up to his thighs. Summersill followed behind, stepping in Sawyer's snow prints.

Sawyer had spotted a small group of trees covering a rock formation about halfway up the ridge. Now, as he plunged through the snow toward the spot, he could see that several of the rocks joined together to form a cave. Soon he was pushing his way inside. But the sloping ground was covered by a sheet of ice. Each time he crawled up, he slid back down. On the third try, he succeeded in pulling himself to the rear of the cave by his arms. He braced his feet splay-legged against two rocks. Then he extended a hand to Summersill, who slipped and slid up into the cave, grabbed a rock, and held on, only to slide completely out again. Finally, Summersill wedged himself inside.

In the rush to get away from the burning plane, neither man had had time to think. Now, as they sat crouched in the cave catching their breath, Summersill, not ordinarily a religious man, found himself praying at top speed. He turned to look at Sawyer and saw him make the sign of the cross.

"Give me the first-aid kit," Sawyer said. Summersill looked down and, for the first time, realized that he had brought the kit from the plane.

(Continued on page 63)

First Team

The *years-ahead* design and production capabilities of Northrop Aircraft, Inc. are time-proved by the performance of the long-range Scorpion F-89 all-weather interceptor series. Today the newest members of the Scorpion family, the F-89Ds, constitute the "first team" of the U. S. Air Force, standing combat-ready at our most critical defense bases. Although the Scorpion's basic lines were laid down years ago, advanced engineering enables it to penetrate into the high altitudes where tomorrow's bombers will travel. Now armed with the massive striking power of 104 air-to-air rockets—heaviest punch in the air defense arsenal—the reliable Scorpion, with its two-man crew, can make effective use of even newer weapons as they are proved and produced. Because of this unique design flexibility, the Air Force has gained years and saved millions of tax dollars in its build-up to defensive strength. Like its teammate, the Northrop Snark B-62 long-range pilotless bomber, the Scorpion is a product of the creative ability of Northrop Aircraft, Inc.—since 1939 world leaders in the design, development and production of all-weather and pilotless aircraft.

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But more important to our national defense than the aircraft themselves, is the experienced personnel that brings them into being. At Douglas this experience dates back 35 years, and is spread among thousands of men and women whose combined talents made possible: Globemaster's lift of 50,000-lb. payloads; Skyray's record of 753.4 m.p.h.; Skyrocket's speed of 1327 m.p.h.; new military horizons opened by such jets as the A3D, B-66 and A4D; guided missiles like Nike and rockets like Honest John.

This vast arsenal of experience made possible the Douglas concept of more performance per pound of plane; which is another way of saying—*more defense for your tax dollar.*

F4D Skyray

Only carrier plane to hold speed record

C-124 Globemaster

Biggest production transport, 25-ton payload

A4D Skyhawk

Can take off from small carrier with A-bomb

Honest John

Delivers atomic or high explosive warhead

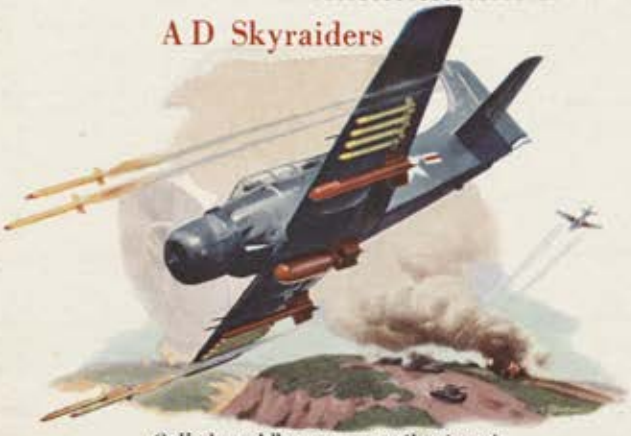
YC-124B

First military transport to use turboprop power

X-3

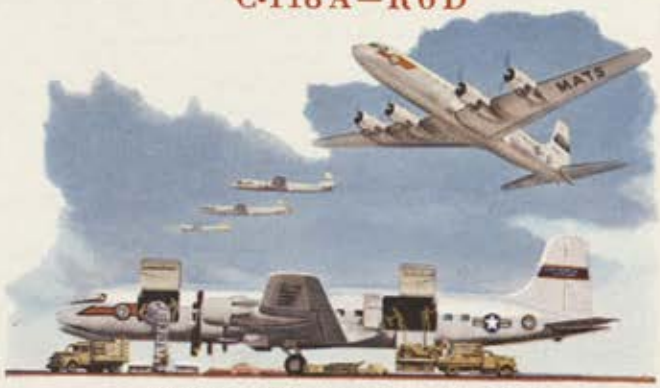
Jet research plane, performance classified

A D Skyraiders



Called world's most versatile aircraft

C-118A–R6D



Air Force and Navy versions of the DC-6A

Nike Rocket

Supersonic anti-aircraft missile already in service

D 558-2 Skyrocket

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A 3 D Skywarrior

Navy's largest carrier-based bomber

R B-66

Versatile Air Force reconnaissance bomber

F 3 D Skyknight

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CF-100's in formation on winter patrol over Canada's Northern approaches.

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Three CF-100 all-weather interceptors recently flew the Atlantic and are now on evaluation tests with the R.A.F. in England.

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Additional evidence of the serviceability and performance of the CF-100 is its unanimous selection to equip by 1956, four R.C.A.F. squadrons to strengthen the all-weather defence capabilities of NATO in Western Europe.

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Three CF-100's flew the Atlantic in March and four R.C.A.F. squadrons will be on duty over Europe in 1956.

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Summersill said, "Is it bad, Wayne?"

Sawyer looked closely at the deep cut in Summersill's forehead and replied:

"No, Clem. Just a few cuts."

"You're trying to make me feel good, Wayne. You know damned well my forehead is falling into my face. Isn't it?"

"No." He shook his head.

"Give me your signal mirror. I want to look at it before you bandage it up."

Sawyer got out his signal mirror and Summersill looked at his forehead. It looked worse than he had imagined. He would not live another two hours, he thought. He handed the mirror back to Sawyer. He said a few more prayers as the captain bandaged his head tightly with gauze, and then slipped his wool knit cap back over his head.

Then Summersill remembered Sawyer's knee.

"Let's see the leg," he said to Sawyer.

They rolled up his trousers leg and looked at the injured knee. It was bleeding badly. The skin was severely lacerated. Summersill put a bandage on the knee while Sawyer got out an extra pair of wool socks, took off his fleece-lined boot, and changed the wet sock for a dry one. As he did so, Sawyer, who had had much experience in Alaska and Washington, gave instructions to Floridian Summersill on walking through snow.

"It's very important that our feet do not freeze," he said. "If you get frostbite, gangrene'll set in and you'll lose your feet and legs. If a foot gets wet, I have an extra dry sock here. Avoid heavy perspiration; otherwise, that'll freeze, too. And remember this: amid snow, man loses his instinct of self-preservation."

Summersill's thoughts turned only briefly to the physical discomfort caused by the sub-zero temperature. His feet were already so numb from the hour and forty-five minutes in the plane that he could not feel them. His hands were almost as cold. Both men had lost their gloves in the crash. But Summersill was much more worried about the Chinese Communists. He remembered an old fighter pilot axiom: Troops are always eager to meet the pilot who has been strafing them.

"What're we going to do, Wayne?" he asked. "The Corsairs didn't see us go down. No one's been alerted."

Sawyer was pulling maps from inside his jacket.

"The first thing we have to do, Clem, is get the hell away from the plane. Then we have to get away from this entire area as fast as we can. They are sure to search very thoroughly as soon as they discover that we were not killed in the crash."

Sawyer studied the maps.

"The Communists are here," he said, "and we are right here." He pointed with his bare finger. Not more than a mile separated the two positions. "They ought to be near the plane within a very few minutes."

"O.K.," Summersill said. "What are we going to do? We can't go south toward friendly lines. There are ten thousand Chinese between us and the ROKs." He did not say it, but he thought it: if they were captured, they would be shot on sight. Sawyer knew it, too.

"Why don't we head straight north," Summersill added. "The Communists would never think of looking for us in that direction."

"We might just try something like that," Sawyer said. He was carefully studying a map of the battle front. Summersill was quiet. Sitting in the cave was just like sitting on a block of ice in an icehouse, he thought. The temperature must be at least fifteen below zero. He thought he might be getting dizzy from loss of blood.

"Here's what I think we ought to do," Sawyer said, breaking the long silence. "Here. Look on the map. Over to the east here, there's an area where the Communist front is very thin. There are nothing but Communist guerrillas in through here, no organized front at all. That's because the country is so rugged."

"You mean here, right around Punggni?"

"Yes," Sawyer replied. "See, we can walk northeast, back into Communist territory as you suggested. Then when we get about right here, we can turn southeast, and infiltrate through the lines. I figure it's forty miles, maybe fifty, by ground because we have to go up and down. I believe that if we hide in the daytime and move on a forced march at night, we can make it. What do you think?"

"O.K., I'm with you," Summersill said. "But there's one thing I want to get straight: we're going to get out of here, and I don't mean maybe. There's no use trying to give up. If we do, the Chinks will clobber us for sure—especially the guerrillas. I know they never take POWs. I want it clearly understood that if they corner us, I'm going to shoot it out with them. The only way they will capture me is dead."

Sawyer had been on the verge of telling Summersill the same thing. He said, "You must be reading my mind, Clem."

Summersill added, "And another thing. If we get into any arguments, I want you to know that I will argue with you, but you'll have the last word because you're senior man. And listen to me: I'm going to hold you responsible for anything that happens to us, too."

They both shook hands warmly. Then from a distance, they heard Chinese voices shouting.

"O.K., Clem," Sawyer said, "let's get out of here."

Sawyer let go and slid out of the cave. "Wait a minute," he said.

As Summersill watched, Sawyer took five steps through the snow up and around a rocky ledge toward a barren area.

Then he backed down to the cave again, carefully keeping his boots within his original tracks.

"That'll send them off that way," he said to Summersill.

The two men crawled back into the cave, and clambered out through a small crack between the rocks that opened to the rear. Then they plunged through deep snow, circling toward the top of the canyon wall. Suddenly Sawyer, who was leading, stopped. Summersill came up alongside him.

"What is that?" Sawyer said, pointing to indentations in the snow.

"Tracks," Summersill said. "It looks like a man and one dog."

"Right," Sawyer said.

"A searching party?" Summersill asked.

"Who knows?" Sawyer replied. "They might be Communist tracks. They might be the tracks of a Korean farmer coming to help us."

"How old are they?" Summersill asked. He was whispering.

"I don't know. But we better move on away from here," Sawyer said.

"If the tracks are fresh and the man and dog are nearby, why hasn't the dog barked at us?" Summersill asked.

"I don't know, let's get moving," Sawyer said.

They moved off through the snow as fast as they could travel, keeping one eye on the ground and one on the ridge tops and canyon walls for signs of Communist soldiers. Over an hour had passed since the crash. Though

(Continued on following page)

HELL IS A COLD PLACE — CONTINUED

it was still mid-afternoon, darkness was being hastened along by a huge black cloud shaping up in the northeast. Soon the two men came to a thicket.

"Let's go in here," Sawyer said. "They'll never find us."

"Lead on, friend," Summersill said. The two men pushed their way through the thorny scrubs and bushes and, then, after a moment, sat down. They heard faint voices, coming from the area where they had left the burning plane; then, suddenly, an explosion.

"The plane," Summersill whispered.

"Yes. And I hope it got a few of them," Sawyer said.

Summersill nodded in agreement. Minutes later, they heard Communist soldiers moving up the canyon side toward the cave. They watched as the soldiers spotted the diversionary tracks and, falling for the ruse, set off in the wrong direction. Soon there was more shouting. Another soldier found the real tracks. The Chinese came toward the thicket, spreading out through rocks and snow, shouting and yelling.

Summersill pressed his lips close to Sawyer's ears. "They're coming this way. What are we going to do?"

Sawyer said, "Stay right here. It'll be dark in another half hour." He looked at the black cloud in the northeast. "Just hang on."

They waited twenty minutes. By then the soldiers were very near. But it was getting dark very fast. The soldiers turned on flashlights. Summersill counted twenty lights.

"Don't you think we ought to move on?" he asked.

"Wait until you are sure you cannot see them any more—just the lights. Then we can be sure they can't see us, and we'll go fast. It won't matter if they hear us in the thicket. They won't be able to figure which way we went."

Before darkness closed in, the two men took a final look at the escape route on the map. It was plain that there would be many obstacles on the journey. The biggest was a sizable mountain, about 5,000 feet to the summit. They could see it plainly, towering over them in the northeast. It was covered with deep white snow. Climbing it would not be easy.

"Shall we go around it?" Summersill asked.

"I believe that if we try to go around it, we will run into Communists," Sawyer said. "There're fewer Communists on top of the mountain than any other place. It'll be tougher hiking, but safer."

"O.K., pal, I am with you all the way," Summersill replied.

As soon as they could no longer see the outlines of the Chinese soldiers, the two men got up and pushed out of the thicket, heading northeast toward the mountain. They stopped to rest.

"That's the tallest mountain I have ever seen," Summersill said. "What does it say on the map again?"

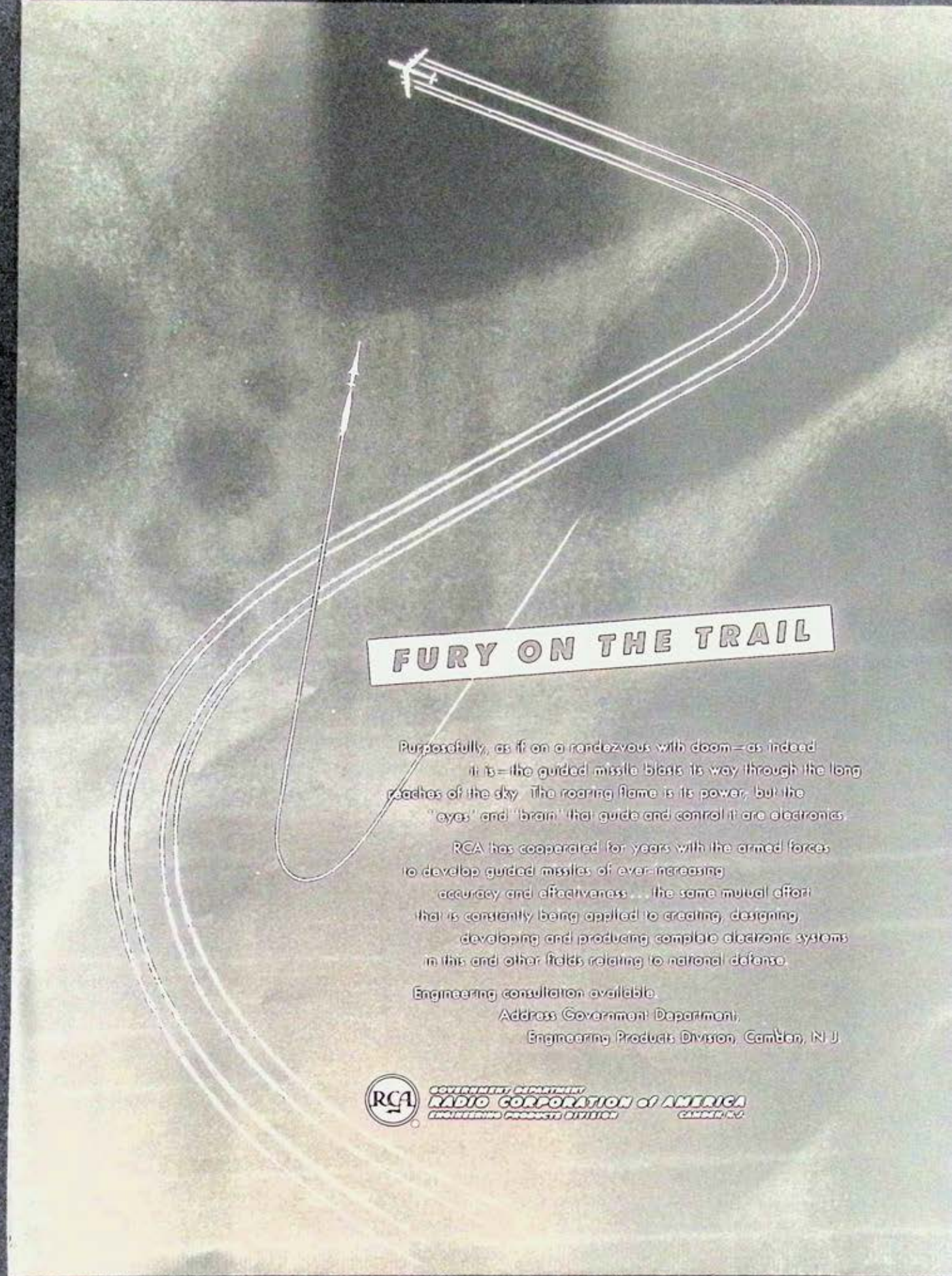
"Four thousand, seven hundred and fifty-nine feet," Sawyer said.

"Are you sure?" Summersill asked.

"Follow me and you can count them yourself," Sawyer said. He picked up a hefty stick, invited Summersill to do the same, then started up the long, white slope of the mountain.

The dark cloud had been warning enough, but they were really not prepared when the blizzard struck. They had moved about a quarter of the way up the slope. At first, the snowflakes were harmless, fluttering across the mountainside, a godsend, covering their trail. But then, the white flakes came in torrents, followed by heavy wind and sleet. Gloveless, bent against the driving cold, the two men moved slowly up the mountainside.

(Continued next month)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The READY ROOM

RESERVE AND AIR GUARD NEWS

The much-discussed and little-understood **Reserve Officers Personnel Act** is scheduled to go into effect on July 1. But there are signs that it will go on the record books in a version altered from the one signed into law last year.

To clarify the situation as it exists, some history is in order. The Reserve Officers Personnel Act is the child of the **Reserve Officers Association.** For two years Congressional committees in both House and Senate heard hundreds of thousands of words of testimony on the proposed legislation—for and against.

Last year, after the bill had passed the House, the **Senate Armed Services Committee** called interested groups to present their opinions. The **Air Force Association** took a strong stand against the bill, arguing that legislation

As reports were received during the recent "Operation Minuteman," states were posted as "alert and ready" on a map in the Joint Operation Center of the ANG Bureau.

dealing primarily with a system of promotion was not realistic in advance of a concrete mission and program for the Reserve forces.

The legislation was passed but the Air Force Association's position was primarily responsible for a major, last-minute change which delayed the effective date of the act until July 1, 1955.

In the months since the law was enacted last August, the Air Force has established **a series of administrative procedures** designed to implement it. As these policies were announced, the full impact of the elimination features of ROPA was felt by Reservists, both on active and inactive duty. **Particularly hard hit** were officers in Tables of Organization units where promotion opportunities are limited. Reaction was so strong that a series of amendments were prepared in the Pentagon which, in effect, would soften the immediate forced attrition blow.

These amendments have been introduced in Congress by **Sen. Margaret Chase Smith of Maine** and are contained in Senate Bill 1718. The Senate Armed Services Committee held hearings last month and appeared impressed with arguments that the **revisions should prevail.**

There are **two principal amendments.** One would give Air Force authority to declare a five-year moratorium on placing into effect the **mandatory retirement features** which apply to Air Guard and Air Reserve officers. This amendment was sought because the mandatory features changed the rules in the middle of the game for many officers who might have earned retirement under **Title III of Public Law 810.** Further, a similar grace period was extended to Regular colonels under the **Officer Personnel Act of 1947.**

The second principal amendment would **permit a Reserve officer** on extended active duty, who has completed at least eighteen years of service, **to be retained until he finishes the twenty years** necessary for retirement under Title II of Public Law 810.

This amendment was asked because a large number of Reservists on active duty, who were closing on the goal of twenty years, suddenly were informed that they must be eliminated. One dentist with nineteen years of service told the Air Force Association he had been notified that he would be eliminated by ROPA six months short of becoming eligible for retirement.

The amendments have the blessing of both the **Air Staff** and the **Air Staff Committee on National Guard and Reserve Policy.** In large measure, they will protect current combat pilot strength in the Guard and Reserve.

Unless amended, the Air Guard, for example, stands to **lose almost 600 veteran combat pilots** of World War II and Korea between July 1 and June 30, 1956. The Guard also wants the moratorium to **protect the useful flying careers** of the 500 pilots and observers it now trains annually. In its present form, ROPA would establish seven years as the maximum time the majority of this group could be retained.

Still another amendment, of considerable interest to the National Guard Bureau, would **provide for retention of officer technicians** who might be promoted mandatorily to a grade in which no vacancy exists at the time of promotion. These officers, civilian employees in such key positions as operations and maintenance directors, number about 550.

Brig. Gen. George R. Dodson, Chief of Staff of the Oregon ANG, talks with Col. Russell A. Cone during a recent tour of FEAF installations by top-ranking US air Reservists.

Whether the amendments, which the Air Force Association has endorsed, prevail or fall by the wayside, **the Air Force has created the administrative machinery to carry out ROPA's dictates.** Reservists have been asked to elect to become active in the program or be removed from the rolls; **screening boards have been convened** at the Records Center in Denver to set up the lists of those who must be considered for promotion; and letters have gone out to those who are faced with forced elimination.

° ° °

The Air Force proposes to spend **more than $250 million** in the next four years **for facilities for the Reserve and Air**

Guard. Of this amount almost $200 million is programmed **for flying activities** and the balance for such non-flying activities as **Reserve centers.**

In all, **the Guard and Reserve utilizes**—or will utilize—**194 non-flying and 153 flying installations** throughout the country. When all are operational at the end of Fiscal Year 1960 they will represent **a total investment** that began several years ago **of some $395 million.**

This status report was presented last month to the Air Staff Committee on Guard and Reserve Policy in the Pentagon. But, cautioned **Continental Air Command,** which is

President of IMATA, Col. Ramsay D. Potts, Jr., has been appointed CO of the 459th Troop Carrier Wing (M), Andrews AFB, Md.

monitoring the program, several **problems must be solved to reach the goal** in the estimated time.

It will be necessary to position fighter squadrons where they will have **maximum intercept capability.** This means that twenty-two new locations must be found. Similarly, troop carrier and fighter-bomber squadrons must be located where they will be most **accessible for M-Day assignments.** Sixteen sites are in the offing.

The **problems are complicated** by the fact that the Air Force took over a number of former Reserve locations during the accelerated buildup accompanying the Korean war. And the Air Force must hold these as it continues to expand to 137 wings.

Finally, ConAC is encountering **local resistance** in a number of communities where it has made overtures for joint utilization with commercial activities on muncipally-owned fields.

Still, **ConAC and the Air Force are optimistic** that the program can be met.

° ° °

"Operation Minuteman" is history but important history to those who wanted to know how long it would take the Air Guard to get into the blue in the event of surprise mobilization.

"Minuteman" was **a nationwide test alert** for the entire Guard—air and ground. Guardsmen knew in advance the time period in which the alert would be sounded. But they did not know the day and the hour until the button was pushed in the Pentagon.

By any standards **the Air Guard did a remarkable job** of getting aircraft into the air in a hurry. Air Guardsmen at home, at work, and at play were notified by telephone, radio and television announcements, and word-of-mouth. In the District of Columbia, where the **121st Fighter Squadron had two F-86s airborne within twenty minutes of the alert,** two motor pool airmen arrived within an hour —one in a bell hop's uniform, the other in a baseball suit.

Florida and **New Hampshire** squadrons had aircraft up within twenty minutes and **Oklahoma's 137th Wing** was patrolling the skies forty minutes after the alert sounded. The story was similar in other states—**Kansas, California, Utah, North Carolina.** As the reports flashed from across

(Continued on page 69)

Ryan Electronics "Guides" U.S. Airpower

Using unique continuous wave radar techniques, Ryan has created new flight-tested sources of basic intelligence for planes, missiles, helicopters and lighter-than-air craft. This electronic intelligence controls Ryan's new automatic navigator—a completely self-contained system which can navigate aircraft to any point on earth. This same intelligence can make split-second decisions in hypersonic missiles—sending them to search out and hit elusive and unseen targets. It can be used to design superior systems for bombing, aerial photography, helicopter hovering and anti-submarine warfare. Ryan electronic systems — simple to operate, need less maintenance, fewer adjustments.

Another Example of How

RYAN BUILDS BETTER

Recognized as a leader in electronics, Ryan has the skilled personnel and experience to meet the most complex navigation and guidance requirements. Beginning with the miniaturized radar equipment for the first air-to-air missile —the Ryan Firebird of 1946—Ryan has consistently solved the "can't be done" problems.

Ryan is also pioneering in the development and manufacture of power plant equipment and airframes, including afterburners and other components for jet engines, complete rocket motors for missiles, and vehicles of advanced aerodynamic design. Among the achievements resulting from this engineering effort are Ryan's new jet-powered VTO aircraft, now building, and the Firebee drone missile. Because Ryan blankets all three elements of flight research and development—power plants, aircraft and electronics—it is uniquely equipped to solve the toughest problems of modern flight.

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the country into the big control room in the Pentagon, they added up to one conclusion: the ANG can get all its in-commission fighter aircraft into the air within two hours of any alert.

° ° °

The **Air Force is meeting strong opposition** from the **Civil Service Commission** in its efforts to start a technician program in the Air Force Reserve.

The contemplated program is **similar to that in effect in the Air Guard** where the majority of full-time employees are also members of the unit. Under this system, the Guardsman's civilian job is the same as his military specialty.

The Air Force wants to **extend the system to Reserve flying units** so that on M-Day the key maintenance, supply and administrative people would put on their uniforms and go with their units.

But the Civil Service Commission is balking. CSC says such a system introduces a new philosophy into government hiring in that it sets up military service as a prerequisite to employment.

Lt. Menil Mavraides (center) and Lt. Johnny Lattner, former All-American gridders at Notre Dame, get their blood checked by Dr. Horace Boone, D.C. Chapter of the American Red Cross, during Bloodmobile visit to Bolling AFB.

Despite numerous representations by Air Force officials that the system it seeks will **increase the potential combat effectiveness of Reserve units** and make for more security per invested dollar, Civil Service Commission has refused to retreat from its position.

° ° °

Both the National Guard Bureau and Continental Air Command are sending word to the field of **awards to be presented by the Air Force Association** to outstanding Guard and Reserve units and airmen.

The Reserve unit, selected by ConAC as the most outstanding in the country, **and the Guard unit,** selected as most outstanding by the Bureau, **will receive trophies.** The outstanding Reserve and Guard airmen will receive individual plaques.

The presentations, part of AFA's continuing program to stimulate participation and performance in the Guard and Reserve, **will be made August 10 in San Francisco** during the Reserve Forces Clinic, first major event of AFA's 1955 Convention.

° ° °

Brig. Gen. Winston P. Wilson, chief of the Guard Bureau's Air Force Division, has been **nominated for a second star** and appointed Bureau Deputy Chief.—END

Ricks Event Entrants Announced

Nineteen of the Air National Guard's twenty-seven wings will be represented in the Air Force Association's second annual Earl T. Ricks Memorial Trophy event on July 2.

The entire range of Guard fighter aircraft will take part in the flight from Los Angeles to Detroit, to be held in conjunction with the International Aviation Exposition of the Aero Club of Michigan.

The defending champion, Lt. Charles J. Young of New Jersey, again will represent his state. Also scheduled to make his second start is Maj. Robert Love, a Korean ace.

Except for determining the winner, rules are similar to last year. Each wing must make its own refueling arrangements; external tanks may be used but not dropped in flight. Last year's winner was selected on the basis of elapsed time. This year a handicap system has been devised. The winner will be the pilot who gets the best performance from his airplane.

The Air Force Association will award plaques to the top pilot in each class. The Ricks Trophy will be presented to the event winner at the Airpower Banquet during the annual AFA Convention in San Francisco, August 13.

Entrants are:

Arkansas (154th Sq.)—Capt. Laurence O. Savage, F-80.
California (146th Wg.)—Maj. Robert Love, F-86.
Connecticut (103d Wg.)—Capt. Walter R. Miller, F-84.
Delaware (113th Wg.)—Maj. David F. McCallister, F-86.
Indiana (122d Wg.)—Capt. Vernon D. Jersey, F-80.
Iowa (132d Wg.)—Maj. Allan R. Packer, F-80.
Kansas (137th Wg.)—Maj. Ivan L. Behel, F-80.
Michigan (127th Wg.)—Capt. Phil C. Brockman, F-86.
Minnesota (133d Wg.)—Capt. Dean G. Ostroot (pilot), Lt. Kenneth J. Leland (radar operator), F-94.
New Jersey (108th Wg.)—Lt. Charles J. Young, F-86.
New York (107th Wg.)—Capt. Arnold G. Wackerman (pilot), Capt. Curtis Ehlert (radar operator), F-94.
Ohio (121st Wg.)—Lt. Col. James A. Poston, F-84.
Oregon (142d Wg.)—Lt. Col. Staryl C. Austin, Jr., F-86.
Pennsylvania (111th Wg.)—Capt. C. A. Cadwallader, F-84F.
Pennsylvania (112th Wg.)—Capt. G. C. McCrory, F-84F.
Texas (136th Wg.)—Capt. Jack M. Burden, F-80.
Utah (144th Wg.)—Maj. Robert E. Erickson, F-86.
Vermont (101st Wg.)—Maj. Wendell R. Gomo (pilot), Lt. Edward E. Horton (radar operator), F-94.
Wisconsin (129th Wg.)—Maj. Howard E. Mattes, F-89.

Last year's Ricks event winner, Lt. Charles Young of New Jersey, here shown with the trophy, is introduced to the air show crowd at Detroit by Milton Caniff. With them are Brig. Gen. Winston P. Wilson and Miss Anita Ekberg.

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Alexander Graham Bell Should Have Stood in Bed

If you are not sporting lower grade shoulder ornaments in Washington military circles, you probably never heard of me, though among the humbler ranks in the Pentagon I am a minor celebrity.

My admittedly limited fame rests—as fame so often does—on a rather simple fact: I happen to have completed a duty tour in the capital in less than a year. Ordinarily, a stretch of about four years is the fate of most men picked for Washington duty.

My premature decampment from the Potomac area was the result of a simple telephone call—or perhaps I should say a series of telephone calls. As a result, the word went out that a non-conformist was abroad in the Pentagon corridors; irrefutable proof existed that I had committed military sacrilege by "going out of channels."

Since public revelations of monitored telephone calls seem to be the rage these days, here is mine. It is an almost exact transcript of one of the last telephone conversations in which I was involved while serving as an Information Officer on the Air Force desk of the Press Branch in the Department of Defense.

SECRETARY: Equipment Planning. Miss Malaprop speaking.

SOBBEE: This is Captain Q. N. Sobbee. Is Colonel Ramble there?

SECRETARY: Colonel Ramble is out having coffee just now. Will you speak with anyone else?

SOBBEE: Yes. Let me talk with his deputy.

SECRETARY: That's Colonel Flak. Just a moment, please.

FLAK: Colonel Flak.

SOBBEE: Colonel, this is Captain Sobbee of Air Force public relations. I wonder if you can help us? We've been asked if the new clothing allowance for airmen permits the issuance of replacement shoelaces for old worn ones. Can you give us anything on that, sir?

FLAK: I see. Well, I'm not too well versed on that end of the program. I should imagine, however, that there would be a monetary deduction if replaced, though perhaps slight. But I would prefer that you speak to Major Retread on that. He's been handling the project and has been in on the ground floor. Just a moment.

RETREAD: This is Major Retread. Can I help you?

SOBBEE: I don't know. This is Captain Sobbee from Air Force public relations. We've been trying to find out if a new pair of shoelaces is issued as a replacement for the old pair.

RETREAD: Hmmmm! That's a good question. Off-hand, I couldn't say, but hold on a second. Who did you say this was?

SOBBEE: This is Captain Sobbee, public relations.

RETREAD: Just a minute.

SHARPEY: Colonel Sharpey here. Say, captain, just what is this information to be used for?

SOBBEE: Well, sir, we have a query here from a newspaper. They have a letter from one of their readers.

SHARPEY: You mean this is for publication?

SOBBEE: Yes, sir.

SHARPEY: Well, I don't believe we can give out that sort of information. What do they want that sort of stuff for?

SOBBEE: Well, I guess they want to answer a reader's question, sir.

SHARPEY: Well, dammit, it's none of his business. Tell the man to put his questions through proper military channels.

SOBBEE: I don't know the man, sir.

SHARPEY: Find out from the newspaper then. We can't be answering questions from every Tom, Dick, and Harry.

SOBBEE: But, colonel, we can't ask the newspaper to name its readers. We must give out all the information asked, if it is not classified.

SHARPEY: I'm not too sure about that, captain. You public relations people are always shooting off too much anyway. I don't think I want to give out an answer for publication.

SOBBEE: Well, colonel, we have to decide that in this office, sir. If you will just give me the answer, I'll take care that it gets to the paper without any distortions or mistakes.

SHARPEY: Captain, I'm afraid I can't go along with you if it's for use in a newspaper. You never know what might be behind such a question, you know. I suggest you call Colonel Backlog in supply. He is in charge of the division. Try 76459.

SOBBEE: Thank you, colonel. I'll try him.

SECRETARY: Supply Division. Miss Nudnik speaking.

SOBBEE: Is Colonel Backlog there, please.

SECRETARY: Just a moment and I'll check. I think he may have stepped out for a minute. Oh, here he is now!

SOBBEE: Thank you.

BACKLOG: Colonel Backlog.

SOBBEE: Colonel, this is Captain Sobbee in public relations. Can you tell us if an issue of shoelaces is deducted from an airman's clothing allowance, or is it made free?

(Continued on page 75)

Bottoms Up!

TELEVISION has moved the ocean floor upstairs.

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BACKLOG: Captain, I'm tied up right now. I wonder if you would call Major Retread on that. He's in Equipment Planning. 76832.
SOBBEE: Colonel, I just spoke to him and his office referred me to you.
BACKLOG: Captain, this is a policy-making division. We can't go into anything like that on this level. Haven't time. I suggest you call Station Issue at 65484.
SOBBEE: All right, sir. Thank you.
BACKLOG: Not at all. Any time.
SECRETARY: Station Issue. Miss Knapsack speaking.
SOBBEE: This is public relations. I'd like to speak to somebody there about the issuing of shoelaces.
SECRETARY: I'm sorry, sir. There is nobody here just now. Do you want to leave a message?
SOBBEE: No. Can you tell me where else I might be able to get some information on it?
SECRETARY: Well, you might try Colonel Backlog in Supply, or Colonel Sharpey down at Equipment Planning.
SOBBEE: I've already talked with them. Isn't there some officer there who could give me a little light on the subject?
SECRETARY: Oh, here comes Colonel Porterhouse. Maybe he can help you.
PORTERHOUSE: Colonel Porterhouse speaking.
SOBBEE: Colonel, Captain Sobbee from public relations. Can you tell me if an airman must pay for new shoelaces, or does he get an issue of new ones?
PORTERHOUSE: Captain, if you call Major Retread at 76832, he can give you the latest word on that.
SOBBEE: I already spoke to him, colonel. He referred me to somebody else.
PORTERHOUSE: Well, if you try the Facilities and Storage Branch, I'm sure they can help you out.
SOBBEE: Thank you, colonel.
SECRETARY: Facilities and Storage Branch. Miss Pepperoni speaking.
SOBBEE: Is there anyone there who can give me some information about the issuance of shoelaces?
SECRETARY: I'm sorry. There is no one here just now. They are all out to a conference.
SOBBEE: Thank you.
OPERATOR: Bolling Air Force Base.
SOBBEE: Give me the supply room, please.
SUPPLY ROOM: Base supply, Sergeant Nodice.
SOBBEE: Say, sarge, I know I'm out of channels and all that. This is Captain Sobbee over at the Pentagon. Does a guy get a new pair of shoelaces when he breaks his old ones?
NODICE: Hell, no, Captain! He pays for 'em.

Capt. Q. N. Sobbee

Eight Miles Closer to God

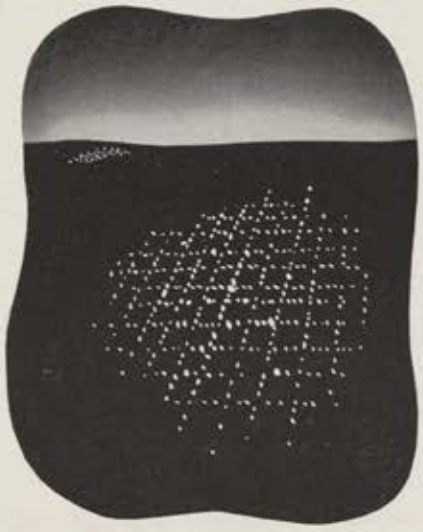
The soft whine of the turbine filled my ears as my swept-winged machine hurtled through the troposphere with vibrationless grace. The gadget with the flaming heart had once again involved me in a passionate romance.

The distant mountains inched slowly toward me as the panorama crept beneath the silver wings of my machine and disappeared from view. The earth was slowed to a snail's pace and its mountains, valleys, fields, and streams were covered with a man-made haze that robbed them of their natural beauty. Man, in his haste to achieve perfection, had enshrouded his world with a cloak that defeated his own purpose. Only the upper troposphere, with its lethal, cold, thin air, retained its natural beauty. And the small Tennessee town to my left and below reminded me that man had the power to alter the natural beauty of the earth.

Over Knoxville the radio compass needle spun in its cage, then pointed to 180 degrees, indicating that the radio station had been passed. Three turns of the tuning crank and the radio compass needle slowly pivoted and pointed once again to the top of the dial. Tri-City Radio was sending its electrical impulses through the radio compass and forcing its will upon the instrument.

In the distance, perhaps fifty, sixty, eighty, or one hundred miles—it wasn't possible to tell exactly in the deceptive blue wilderness—a contrail moved toward me ever so slowly. We were roaring toward each other at a combined rate of a thousand miles an hour, but to the eye the approaching machine and the whole world moved in slow motion.

In a few minutes the speck with



the long white plume passed a few thousand feet to my right and slightly above. The swept wings and protruding jet pods betrayed it as a Boeing B-47 bomber. The sunlight danced along its silver fuselage and reminded me of a day in England, during World War II, when Boeing was well represented in the sky.

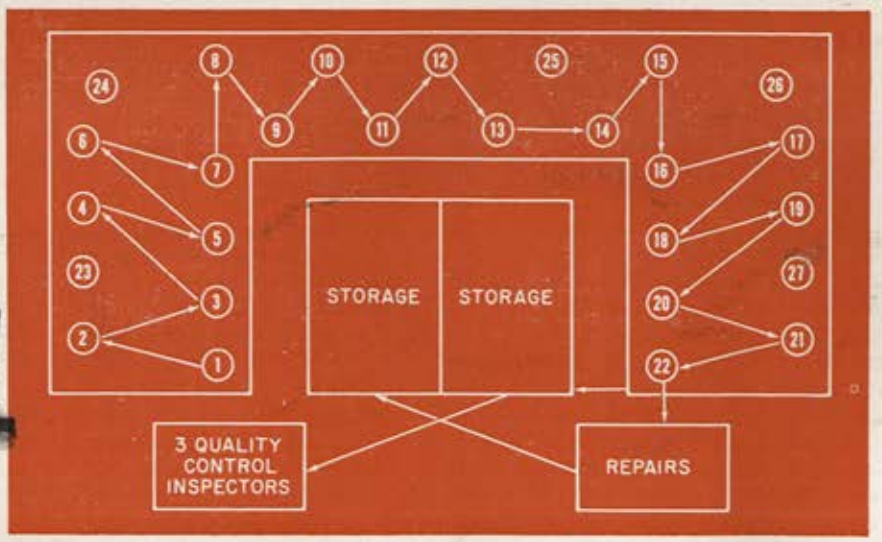
* * *

It was a cold day in April and the wind whipping across the aerodrome at Great Ashfield caused me to tighten my silk scarf and pull the collar of my leather jacket higher around my neck. It was getting on toward night and the sun was low on the western horizon.

A flight of green-nosed Mustangs hurried over the 'drome, laboriously dragging their burdensome empty metal drop tanks back to Thedford. They were weary and frustrated from the long haul to Munich where the German had failed to make his appearance. Their hum faded to a faint buzz as the steady drone of the big friends coming home to roost filtered in from the east. In the distance the Forts were mere specks scattered over acres of purple sky. One of those specks should be carrying my kid brother who wore wings like mine. As they approached, the specks sprouted wings and moved closer to one another in a salute to the guys on the ground who toiled to keep them in the air. Half a hundred proud Fortresses, with the glint of the setting sun ricocheting from their wings, thundered across the aerodrome.

The Forts began pitching off to land and for what seemed like an eternity they droned around the traffic pattern, then lumbered down the approach and rushed past the runway control wagon with smoke pouring from their

(Continued on page 77)



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In producing 23,500 Receiver-Transmitters for the Signal Corps, Lewyt had to meet a quality level of 6.5 defects per 100 equipments.

Each Receiver-Transmitter had more than 5,000 major attributes (major points of inspection) or a total greater than 500,000 for 100 units. Allowed only 6.5 defects per 100 units, meant a maximum of 1 defect in 77,000 possibilities!

Such exacting requirements made normal inspection techniques useless. Because of the fatigue factor, no inspector could be expected to maintain the necessary quality level throughout the day.

In order to eliminate the fatigue factor, Lewyt created the revolutionary "Mass Production Inspection Line" diagrammed above. Lewyt's high degree of flexibility permitted them to draw inspectors from all parts of the plant and put them to work on this "Line" for *only* the first two hours each day.

THIRTY PEOPLE IN ALL WERE USED AS FOLLOWS:

- No's 1 and 22 were material handlers.
- No's 2 through 21 were inspectors, each of whom spent only *75 seconds* on one small area in each piece of equipment.
- No's 23 through 27 were utility inspectors who aided regular inspectors when they fell behind and who repeated the inspection by their group when work was on schedule.
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As a result, the quality level of all sets exceeded Signal Corps requirements of 1 defect in 77,000 possibilities!

This is typical of Lewyt's highly efficient, amazingly flexible Quality Control System. A pioneer in Quality Control, Lewyt served as a "guinea pig" when the Signal Corps set up Statistical Quality Control and Acceptance Sampling procedures and more recently the Reduced Inspection Quality Assurance Plan. And, Lewyt assembly-lines have been the training ground for many Government inspectors.

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tires. As each one flashed by, my eyes sought out the checkerboard tail with the big "S" and the fuselage with "Always Available" blazoned across her nose. The sun had completely disappeared by the time the last Fortress whooshed past the runway control wagon. Suddenly the war was no longer a game where Mustangs chased Messerschmidts, but a hateful drama where kid brothers got shot down and mothers, dads, sisters, and brothers cried their hearts out because a proud B-17 called "Always Available" would never fight another mission.

° ° °

The lights of Richmond slipped past and the dull, yellow glow of Washington and Baltimore grew brighter as the Sabre carried me through the purple sky at seven hundred miles an hour. Mother Nature was on my side, placing her gentle but powerful hand on the Sabrejet's tail and hastening it through God's own domain.

From eight miles up Washington, the apex of power in our troubled world, was naught but the twinkling of a million lights to the Jet Age man who hurried past in the night.

The lights of Philadelphia were visible from Washington, and I only had to point the nose of the Sabre in that direction and start it on its journey back to earth. As the silver craft descended it revolted against the strange forces of the transonic speed zone. Bucking and shuddering, it fought against the compressibility of air.

Ten minutes out of Washington the metal bird with the bent wings swooped over Swarthmore at a few thousand feet, and in one of the brick homes below six kids were galvanized into action by the defiant shriek and ensuing rumble of the jet exhaust. Daddy would soon be home again.

It was only a matter of minutes before the Sabre left its element and put me back in mine. A bitter wind tore at the canopy covers of the Thunderstreaks slumbering on the ramp as the crewmen guided me into a parking space. The scratch of my pencil in the flight log told the final story of an incredible journey in an unbelievable age. San Antonio, Texas, to Philadelphia, Pennsylvania . . . two hours, twenty minutes!

With the chocks beneath its wheels and the flame extinguished in its metal heart the Sabre did not excite my thoughts as it had done for a few hours previously. Our romance was over for another day.

Maj. David McCallister
Delaware ANG
Folsom, Penna.

Who Is He?

In the wartime AIR FORCE Magazine, *Larry Bachmann wrote a piece called "Blister Club," in which the following extract appeared. Question: Who was the Fifteenth Air Force lieutenant and where is he now? If this strikes a familiar note to you, would you drop us a line? Address is Editor,* AIR FORCE Magazine, *Mills Building, Washington 6, D. C.*

One of the escapees, a lieutenant from a Fifteenth Air Force Liberator, spoke fairly good French and made rapid progress through the underground. Within a week he was across the Swiss border without ever having been bothered by Nazis. Only one thing occurred that he thought worth mentioning.

At one small house where I spent a day, the woman told me that her husband had been in the French Army, having been taken prisoner four years ago. She'd heard less than a year ago that he was still alive. She was a very nice lady and must have been pretty good-looking before the war. Now her hair was pulled straight back from her forehead and tied in a knot behind her head, and she would look at me with her large gray eyes not as if she saw me, but as if just behind me were occurring all the things she described.

She was fixing me something to eat when there was a rap on the door. I guess I just froze. It was too late to do anything. The door was thrown open, and there were a couple of Jerries outside. The woman walked over to them slowly and casually as if she'd been expecting them and as if I were part of the furniture. The Germans just pushed a piece of paper into her hand and slammed the door behind them. She came back to the table where I was sitting. I always will remember the way she moved. She didn't seem to walk, but to glide along.

We both went over the sheet the Germans had given her. I could understand it easily. The Germans were offering a large reward for any enemy flyers turned in to them. They'd also release a Frenchman from prison camp for every flyer they got. I guess I read slowly, for she was finished reading before I was. I looked at her. This time her eyes seemed to be focused on me, as if she were seeing me for the first time.

Then, with her eyes still on me, her hand reached out and picked up the paper. She crumpled it and threw it into the kitchen fire and went on fixing me something to eat.

the annular wing—forms the container for the propulsive system.

Proponents of the coleopter admit that it is aerodynamically inferior to a comparable conventional aircraft, but they say this is compensated for by lower gross weight, with larger fuel weight and payload—in essence, greater economy.

The burden of proof lies with the proponents of the unorthodox schemes—their machines must not only take-off and land vertically, but also perform their entire mission, whatever it may be, more efficiently and more economically than conventional approaches to the problem. There is no reason to adopt unconventional methods for the sake of unconventionality alone. It will take much study, experimentation, and development effort to find the best of the many approaches to short field operations and to VTOL.

Bombers and fighter-bombers are not the only planes in the tactical inventory. Missiles are also entering the tactical picture. Two squadrons of Martin TM-61 Matador missiles are now in Europe. These lend themselves to the dispersal concept, since they are zero-launched by rocket boost from a mobile launching trailer. The missiles, turbojet-powered, are easily disassembled and reassembled to move from site to site.

There is no reason why strategic air should have a monopoly on ballistic-type missiles. A shorter range, vertically launched, rocket-powered missile with an atomic or thermonuclear warhead could be developed for tactical use. Launching sites could be located behind the dispersed air base complex. Tactical ballistic missiles could be used against fixed targets, such as enemy air bases.

- **Air Defense**

As advancements in technology permit, missiles will make an ever-increasing bid for predominance in the air defense mission, even though the manned interceptor will play a major part in air defense for some years to come.

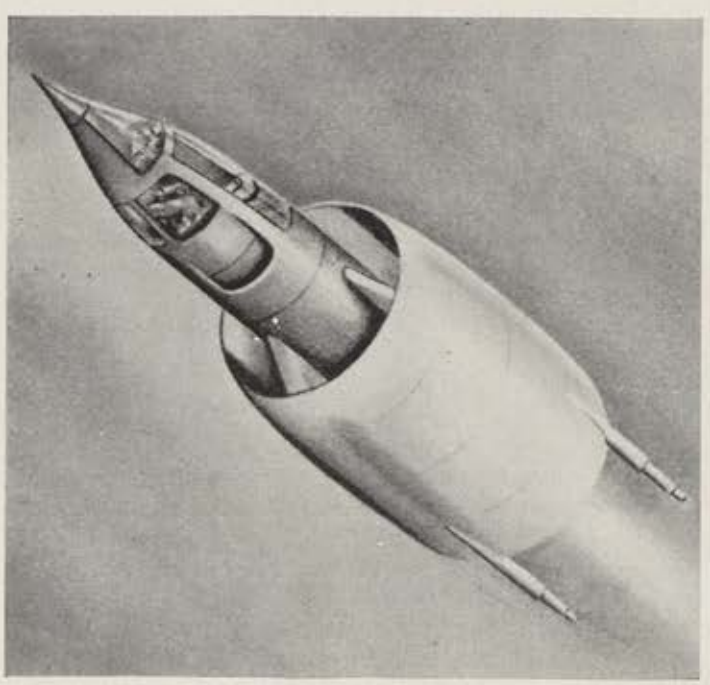
Surface-to-air missiles, such as Nike, Bomarc, Talos, and Terrier, are well adapted to the dispersed, minimum-launching area concept. It becomes a matter of providing enough launching sites to insure a high probability of kill against an attacking enemy force. Some of these missiles, such as Nike, are point defense, or "last ditch" weapons, ringed around certain concentrated target areas. Others, like Bomarc, have greater range, and could be dispersed further from target areas to try for earlier kills.

The demands for increasing speeds require greater thrust in the manned interceptor. As thrust per unit weight increases, the take-off lengths of the airplane decrease, until, theoretically, the aircraft can take-off vertically. In air defense, as in tactical air, VTOL provides the ultimate in base invulnerability, quick reaction, and base location in remote areas.

- **Assault and Support Aircraft**

We have discussed the advantages of, and the methods for, achieving dispersal in strategic, tactical, and air defense forces, based on short field or VTOL capabilities. Let's look at the supply and support system—the logistics—that would enable these dispersed bases to function effectively. It would avail us little to have a remote VTOL fighter base if it could be supplied only by aircraft which need a 6,000-foot runway. The logistics aspect must be designed and

(Continued on page 81)



The unique coleopter has an annular wing that forms part of the power plant. While it is aerodynamically inferior to conventional types, its proponents say it's more economical.

when seconds mean survival

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HOW FAR AWAY IS STRAIGHT UP? CONTINUED

operated to meet the capabilities and objectives of the dispersal concept.

Another side of the supply problem demands like consideration—that of transporting ground troops. The increasing importance of combat airpower in a tactical war is indisputable; however, it is likely that the foot soldier will continue to play an important role. If airpower cannot make ground troops as flexible and adaptable as the combat airpower we have discussed, then aviation is doing only a part of its job.

To do both of these jobs it is natural to turn to the versatile helicopter. Helicopters can do many things. But they have certain inherent limitations, the most important being low speed.

One solution is the convertiplane, which combines the take-off characteristics of the helicopter with the forward flight characteristics of a propeller airplane, with some compromise necessary to each. After the vehicle takes off vertically, the rotor shafts are tilted forward through ninety degrees to the horizontal position, the lift then being provided by conventional wings. Examples are the Bell Aircraft Corp. XV-3 and the McDonnell XV-1.

Although convertiplanes can fly faster than helicopters, even their speed is limited because of the compromises that make the propellers behave like rotors for taking off. On the other hand, their payload capacity is limited, because of the compromises that enable the rotors to perform the propeller task.

Since both helicopters and convertiplanes have certain areas of utility, but do not seem to be the entire answer, let us examine possibilities for freeing the larger, faster logistics and assault airplanes from their stringent runway requirements. One such possibility is coming with the advent of the turboprop. In this role the high speeds provided by turbojets are not essential, but rather a large payload, efficiently carried. The turboprop is a natural for this. It operates relatively efficiently at speeds of 300 to 400 mph, and it provides good take-off and landing characteristics by virtue of its high static thrust and its propeller reversability. At the take-off condition a turboprop provides three to four times the thrust of a turbojet of the same airflow. An example of an airplane powered by just such engines is the Lockheed C-130.

Another concept that may alleviate the basing problems of assault and logistics aircraft is that of water-basing, as previously discussed. Such an airplane could be quite adaptable to beach assaults. Again, special gear for handling and maintenance would have to be devised, but there are certainly great advances to be made in such equipment. A flying example of the water-based concept is the Convair R3Y Tradewinds.

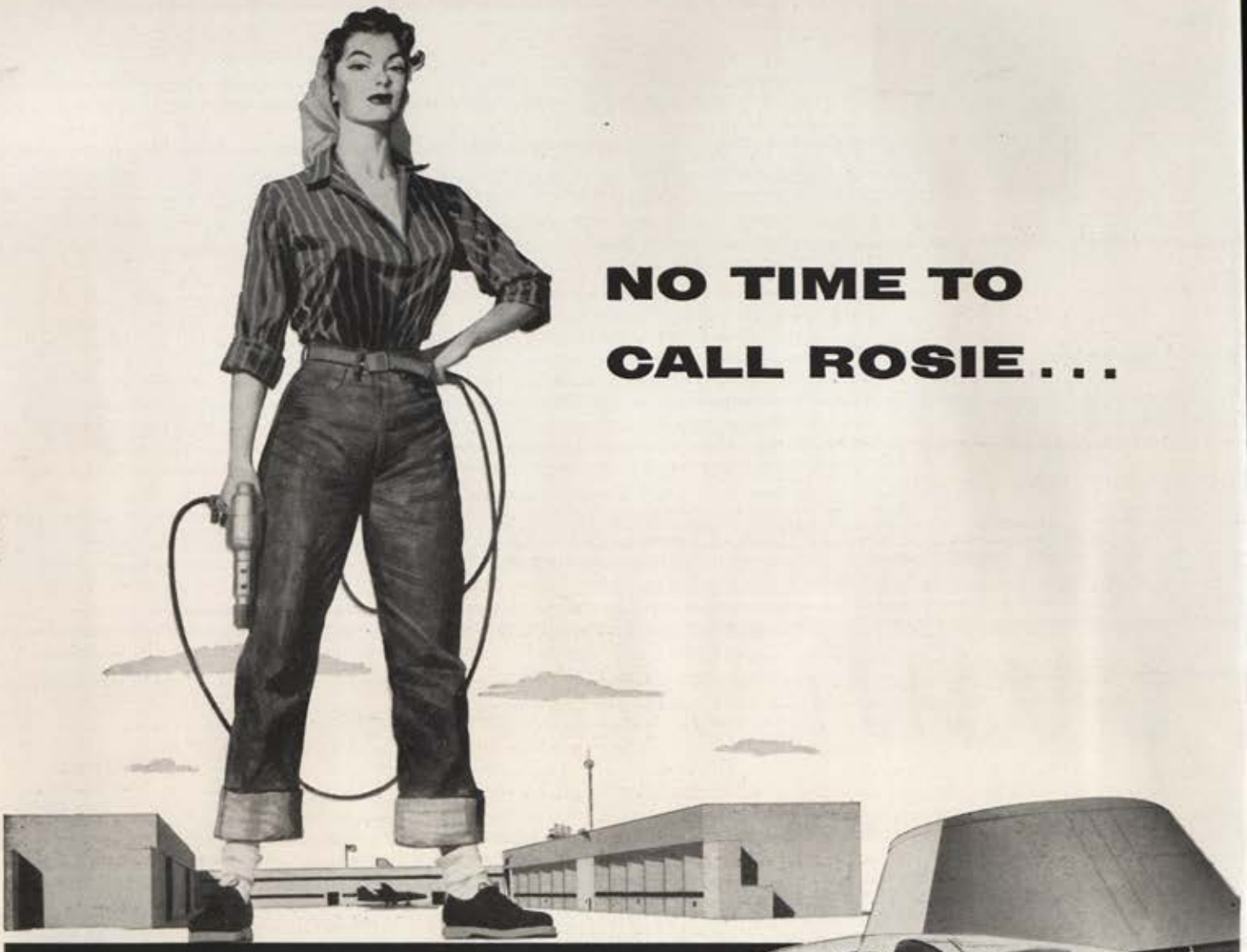
Akin to water-basing is the scheme for equipping aircraft with skis, to operate from a variety of surfaces. This possibility has been demonstrated with aircraft as large as the C-47, landing on snow and ice.

The application of these methods, or other previously discussed, could give support aircraft the same operating capabilities as tactical aircraft. Then an integrated system, based on dispersal, could become a reality.

In summary, the tremendous strides made in nuclear weapons technology have highlighted the dispersal concept as imperative for survival. Dispersal demands reductions in the runway requirements of aircraft. Indeed, this demand can become as important a design criterion as performance.

The many possibilities for achieving a short field capability—and VTOL—must be studied and analyzed. The most attractive must be tested. As these tasks are undertaken and completed, we will be on our way toward realizing a mobile, versatile AF with greatly decreased vulnerability.—END

Lockheed C-130. Turboprops provide good take-off and landing characteristics.



NO TIME TO CALL ROSIE . . .

F9F-8 COUGAR

Just look at what has to fit inside a modern first-line jet fighter like the F9F-8 Cougar. Even if there were time, they could not be built overnight. And yet, complex as they are, Grumman still designs and builds them in record time.

If an enemy struck, there would be no time to make riveters of housewives, no time to build over 12,000 fighters as Grumman did Hellcats during World War II. Your government believes we must have the airpower now to defend us and to strike back instantly. We must fight with operational aircraft, not with what is on the drawing boards or flying experimentally. This is why your Navy knows it can depend on Grumman. Grumman planes, designed as much for quick production as they are for speed and performance, are ready in quantity when needed—which is now.

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World's Finest Aircraft Engines

Tech Talk

By Lee Klein

As every flyer knows, when aircraft wings move through the air, a thin **boundary layer** of air drags along the surface and interrupts the air flow at certain points. This "burbling" of air **decreases the lift** of a wing and increases the plane's stalling speed.

ARDC and the **Navy** have both disclosed details of systems for **controlling the boundary layer.** Two systems developed at the Wright Air Development Center and flight-tested on an F-86F and an XC-123D are said to **reduce take-off and landing speeds by one-third** and runway requirements by half. The first of these—a suction system—was installed in the leading edge of the F-86F to smooth out the thin layer of dragging air. Detailed flight tests by **NACA's Ames Laboratory** showed that the system reduced flying speeds by twenty-three percent. The second system used both suction and blowing air, this time over the trailing edge of the wings, to nullify the undesirable effect of the boundary layer. Tests now being conducted show a **reduction in take-off and landing speed of more than thirty percent.**

The Navy has used **boundary layer control** in its newest jet trainer, the **Lockheed T2V-1** (see cut). Highly compressed air from the trainer's **Allison J-33** engine is diverted into a tube inside the trailing edge of the wing and blown out over the flaps and ailerons through slots. The trainer, a direct descendant of the famed "Shooting Star," has a top speed of **more than 600 mph** but lands at only **ninety-seven mph** using the new system.

First production model with boundary layer control, Lockheed's 600-mph T2V-1 jet trainer sets a fast pace for its predecessor, the veteran Shooting Star.

Hiller Helicopters' "flying platform" has made successful flights. Contra-rotating propellers provide the lift.

The "revolutionary means of flying" that **Stanley Hiller, Jr.,** mentioned in a recent speech but did not elaborate on (see "Airpower in the News," April '55), turned out to be **a small, wingless platform** using the **ducted fan** principle of lift and propulsion (see cut). The machine has made short flights carrying a pilot and was designed and built by **Hiller Helicopters, Palo Alto, Calif.,** for the **Office of Naval Research.** It gets its lift from **two propellers rotating in opposite directions,** sucking air through holes in the platform and blowing it downward for vertical lift. Two engines, visible above the platform, supply **a total power of less than 100 horsepower** to the props. The pilot controls the machine by simply leaning in the direction he wants to go.

A **rubber structure capable of withstanding eighty-mph winds** and snow loads up to twenty-four tons, has been developed by ARDC's **Rome, N. Y., Air Development Center, The B. F. Goodrich Co.,** Akron, Ohio, and the **Bendix Aviation Corp., Radio Division,** Baltimore, Md. It is made out of **thin, air-inflated tubes** and is thirty-five feet long, thirty-two feet wide and 16½ feet high. Designed as an Arctic ground shelter, the unusual structure **can house thirty men** plus the radar gear they would need for plotting and tracking aircraft. The roof and side walls of the structure are made of twenty-four air columns, eighteen inches in diameter. Each column is **capable of supporting 2,000 pounds** when filled with two pounds of air pressure. When deflated, the 7,500-pound shelter **can be carried on a truck** or a small transport plane. The tubes, manufactured of rubber reinforced with nylon, are covered with aluminum on surfaces facing the interior to insulate against heat loss. Two gasoline heaters are used to heat the interior.

Inflated rubber air columns form roof and walls of new AF arctic shelter.

As speeds, and therefore stresses, of modern aircraft increase by leaps and bounds, engineers and designers have required **bigger and more complex light metal forgings.** As part of the program for supplying these parts, the first complete plant of the **Air Force's $279 million Heavy Press Program** was dedicated in Cleveland, Ohio, early in May. The sprawling, twelve-acre plant, built for the AF by the **Aluminum Company of America** is dominated by two mammoth presses towering nearly five stories above floor

(Continued on following page)

level and three stories below ground. At the ceremony, **AF Secretary Harold E. Talbott** pressed two buttons to signal the start of forging operations by a **50,000-ton press** built by **Mesta Machine Co.**, Pittsburgh, and a **35,000-tonner** built by the **United Engineering and Foundry Co.**, Pittsburgh. As the jaws of the bigger press closed on a rough aluminum slab with **a force greater than the weight of the battleship Missouri's 45,000 tons,** observers standing nearby could feel a definite tremor. When the dies were separated, the piece of aluminum had been molded into a wing spar for a jet interceptor. While the plant—leased to Alcoa by the AF—was constructed **primarily to supply producers of military aircraft,** officials at the dedication expressed the hope that some of the plant's capacity would be turned to civilian uses.

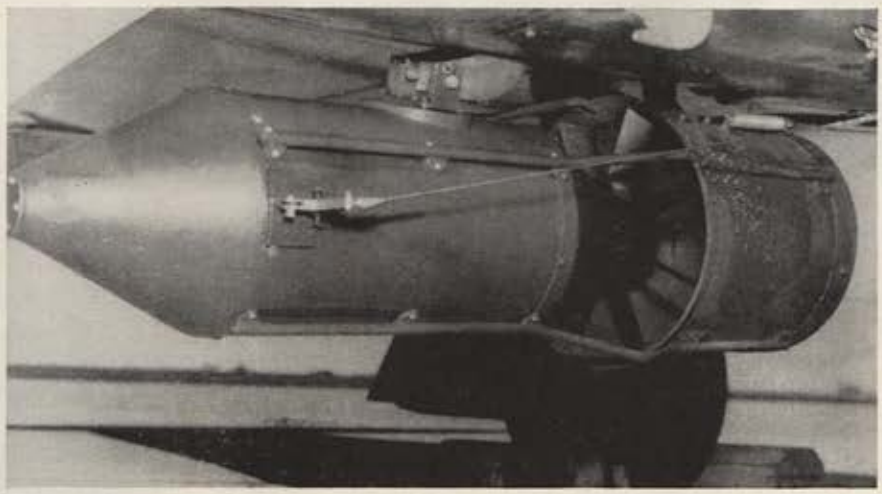
MATS passengers between Washington, D. C., and Rhein-Main, Germany, are the willing guinea pigs in an experiment that may mean no more cold in-flight box lunches. **"Project Frozen Meals"** is currently being conducted by MATS Atlantic Division to determine whether it's **practical to serve frozen, pre-cooked meals** on passenger flights. The passengers have a variety of menus to choose from when signing up for a meal before departure, including turkey, chicken, or steak for dinner and waffles or an omelette for breakfast. Besides this, the dinners have **all the conventional trimmings.** MATS reports that passenger reaction after the first few flights **was enthusiastic.**

The familiar **dark-blue colors on Navy and Marine Corps** combat planes will soon make way for a **new paint scheme** of white and gray. Carrier-type aircraft will be painted glossy **white on the lower surface** and light "gull" **gray on the upper.** Helicopters and patrol planes will be painted gray. The new colors are said to be **better camouflage** than the old. Producers of Navy planes will switch to the new paint as soon as possible, while planes in service will be repainted at their next overhaul after July 1, 1955.

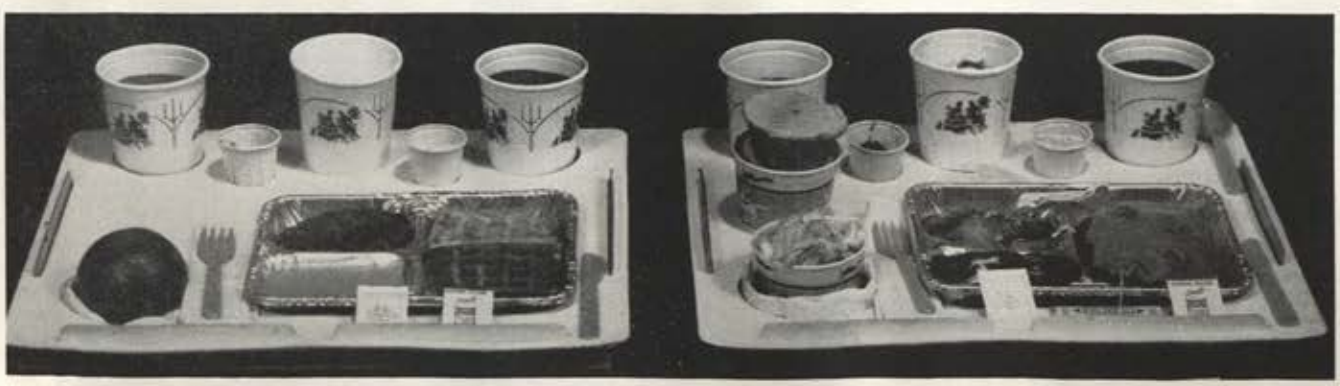
A new **ram-air powered tow-reel** (see cut) that promises to simplify the technique of air-to-air rocket firing practice has been developed by the **Central Air Defense Force** and the **Oklahoma City Air Materiel Center.** The reel uses no electric motor, and the target cable is extended or recovered by regulating the air flow to the propeller on the reel. The new unit, carried in the JATO racks of a standard Lockheed T-33, uses an air door or butterfly valve to regulate air to the propeller. The target is carried out by its own weight by releasing a friction lock and shutting off the air to the propeller. To reel it back in, the valve is opened and **the propeller powers the rewind reel.**

A new model of **Aerojet-General's Aerobee** rocket was recently sent to an altitude of about **123 miles** from the **Holloman Air Development Center, N. M.** The new model, the **"Aerobee-Hi,"** was designed to obtain information on the atmosphere **as high as 135 miles.** AF and Navy scientists cooperated in development of the new rocket which is **manufactured of lighter, stronger metals** than previously used. On its first trip, the Aerobee-Hi carried **a 195-pound payload,** believed to be the **heaviest ever parachute-recovered** from rocket flight.

Performance characteristics of the **Ryan Firebee jet target drone** have been released. It has a maximum speed of **610 mph at sea level** and 605 mph at 40,000 feet; **can fly for an hour and twenty minutes under remote control** at 575 mph at an altitude of 40,000 feet; has **a ceiling of 42,500 feet,** and **a rate of climb of 8,500 feet a minute.** Though designed primarily as a high-speed gunnery target, the Firebee also has **potential tactical applications** as a guided missile or for reconnaissance, according to both Ryan and the Department of Defense.—END



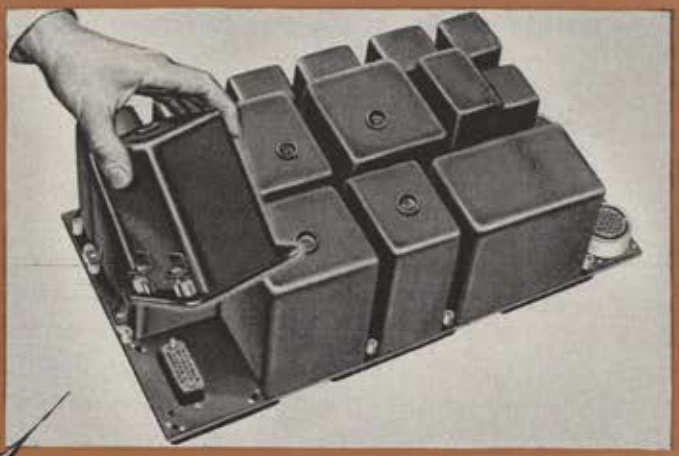
New ram-air powered target tow-reel shown installed on JATO racks of a T-33. Butterfly valve in front of propeller (at right) regulates the flow of air.



MATS passengers between Washington, D.C., and Germany are faring well during evaluation of pre-cooked frozen meals.

The MASTER AIR DATA COMPUTER

Another
SERVOMECHANISMS
Building Block
System



The Master Air Data Computer provides a single coordinated source for input information required by the various aircraft control and instrumentation systems. It is a central "clearing house" for aerodynamic intelligence. There is no fundamental limit to the number of functions, outputs or services that this computer can perform.

The Master Air Data Computer represents another outstanding example of Servomechanisms' design philosophy. As a result of our complete and careful analysis of the problem, our engineers have developed a series of standard plug-in components which, when assembled in "building block" fashion, produce many versions of the Master Air Data Computer—each for a specific application. Consequently each requirement can be tailored quickly and economically through the use of selected "building blocks." At most, only one or two of the "building blocks" require any internal changes. The remaining components are standard for all configurations. In addition to the fast economical and accurate solutions to our customers' problems, all plug-in components of the same type are completely interchangeable thus insuring **maximum** reliability through simplifying maintenance in the field.

Servomechanisms proven ability to **anticipate** and **interpret** our customers' needs, to **design** to specifications, to **produce** in quantity and **follow-up** throughout the life of the delivered equipment, all add up to a **complete service.**

Write for Air Data Computer Brochure, GA3.

Typical example of Servomechanisms "building block" philosophy. Both the Convair F102 and the Northrop F89 use variations of this computer. One requires somewhat different information than the other. A simple change in one of the plug-in "building blocks" and the equipment became custom made for each aircraft.

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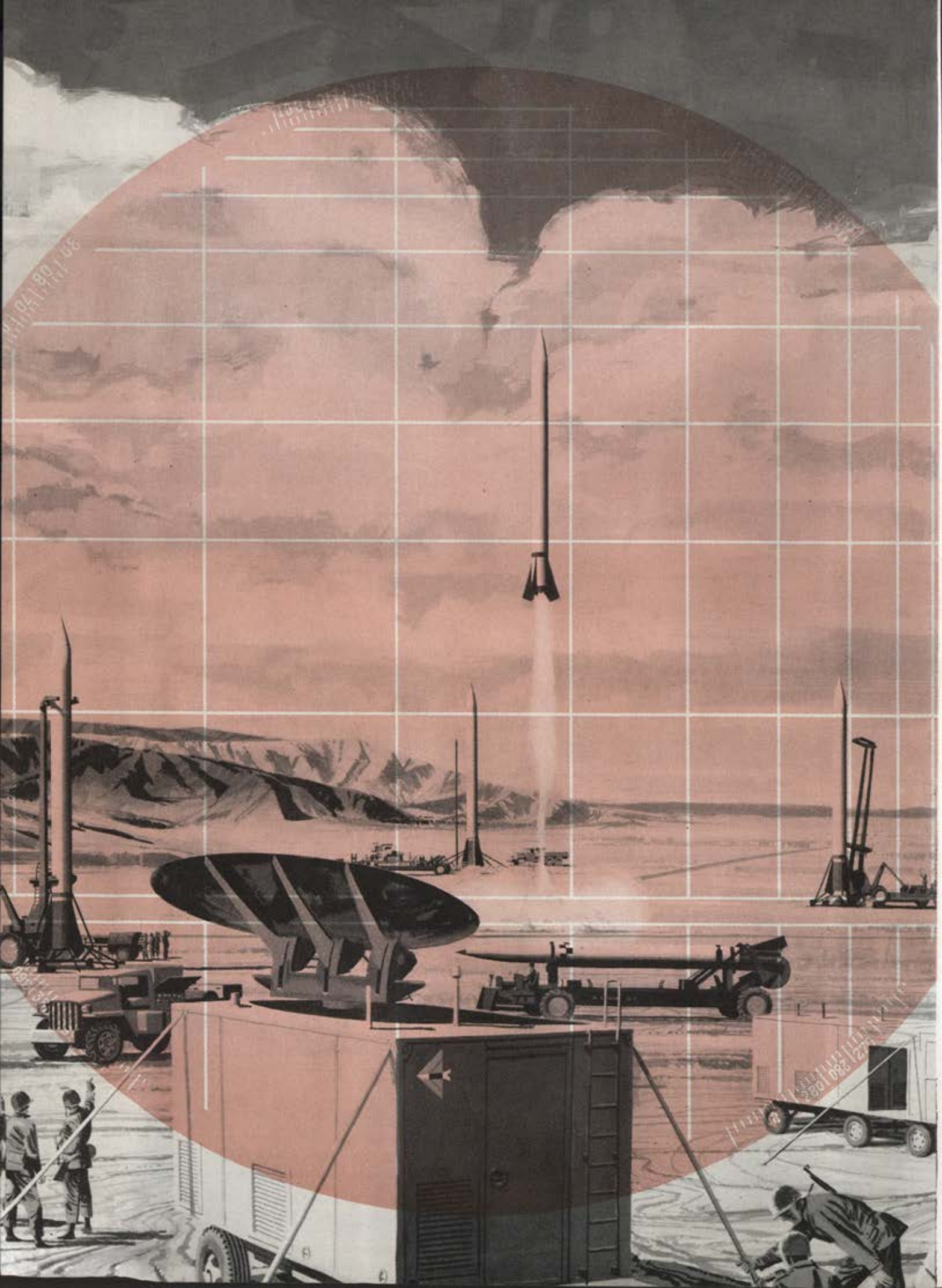


GUIDING THE "CORPORAL"

ELECTRONIC GUIDANCE IS THE SECRET OF THE CORPORAL'S ACCURACY

The U. S. Army required a ground-to-ground missile capable of delivering an atomic warhead at supersonic speed—accurately—to a target beyond the range of artillery. Army Ordnance awarded four prime contracts for this project:

PRIME CONTRACT—RESEARCH
Jet Propulsion Laboratory, California Institute of Technology
Basic research and development covering all facets of total problem.

PRIME CONTRACT—DEVELOPMENT
Gilfillan Bros., Inc.
Improvement, simplification of ground and airborne electronic equipment.

PRIME CONTRACT—PRODUCTION: MISSILE
Firestone Tire & Rubber Co.
Missile and missile handling equipments.

PRIME CONTRACT—PRODUCTION: GROUND GUIDANCE SYSTEM
Gilfillan Bros., Inc.
Complete ground guidance system.

RESULT: *The Army's "Corporal," ground and airborne equipment. In full production; delivery being made to troops.*

Today's missiles are superior to yesterday's mechanically timed rockets for one reason—electronic *guidance.*

It is electronics research and the electronics industry that put the guidance into the guided missiles . . . that share the major responsibility of keeping America first in guided missiles.

Primary credit for the "Corporal" is due to the basic research achievements of the engineers and scientists of the Jet Propulsion Laboratory at the California Institute of Technology. Gilfillan is proud to have been awarded a prime contract to assist in the development and do the production of the vital electronic guidance system.

In the electronics industry, Gilfillan is a recognized leader. Gilfillan's ability to carry on from basic research comprehensively—to approach a total problem as a whole and achieve a whole solution—has been thoroughly proven in GCA Radar, the "Corporal" guidance system, and is now being further demonstrated in top secret projects in a number of fields.

Today and Tomorrow
Comprehensive Research and Development

GCA RADAR AND ELECTRONICS
Gilfillan
LOS ANGELES
GCA
AROUND THE WORLD

What every new officer should know

Just a second,

EXPECTANT mothers and new second lieutenants have at least two things in common—both are headed for an experience unique in their lives and each is on the receiving end of plenty of free advice. Fortunately for the human race, both parties usually survive.

For some reason, the mention of the phrase "second lieutenant" brings a paternal smile to the military countenance. It is a condition to be tolerated, like adolescence—"the boy will outgrow it."

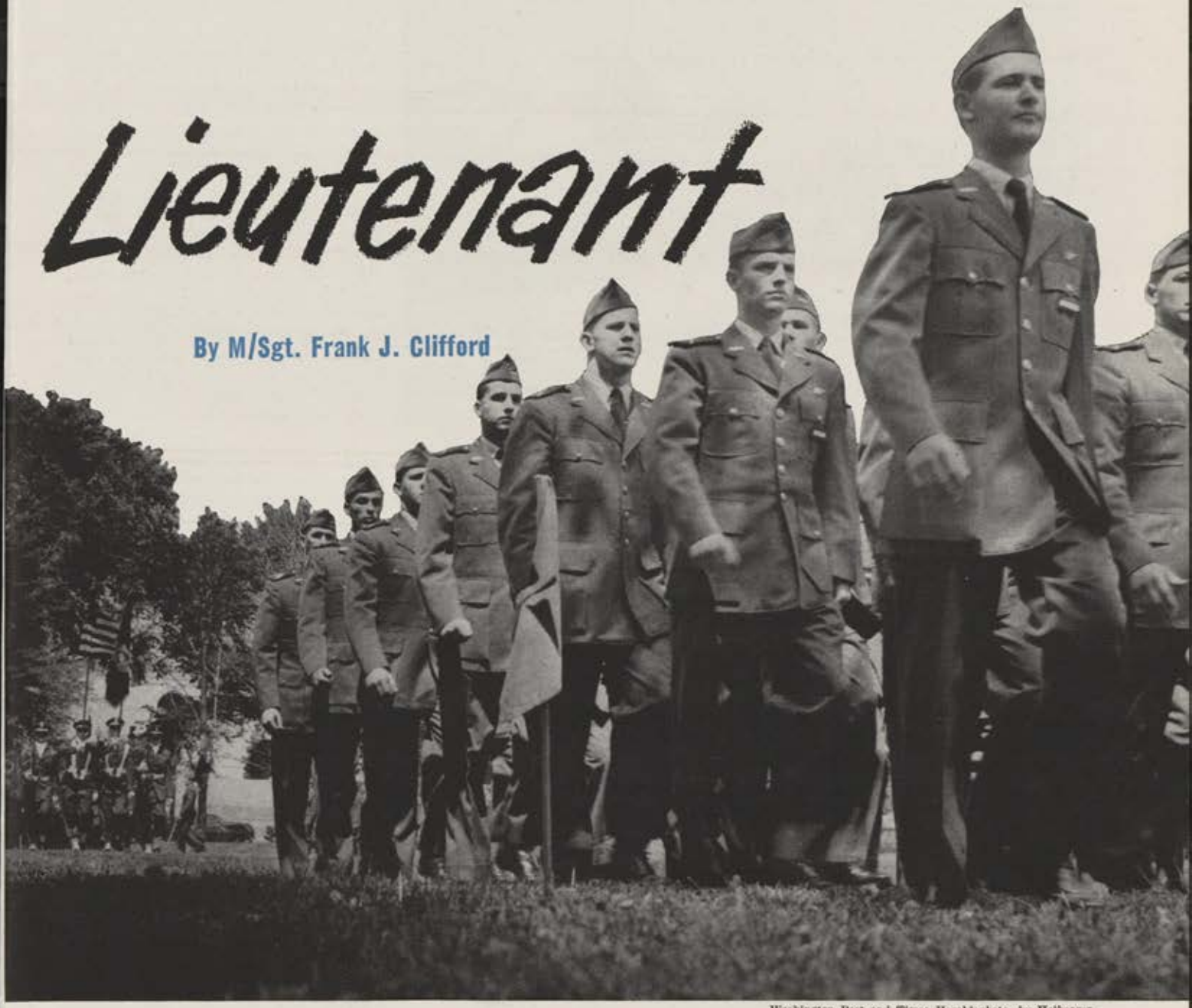
But his growing pains can be considerably lessened if he is taught the ropes before he comes to grips with them. Since most second lieutenants entering the Air Force today are products of the ROTC program (10,200 are expected to don brass bars during the year May '55 to April '56), almost all of them have been briefed well enough to allow them to make the transition from campus to camp with a certain degree of elegant grace and poise. John Second Lieutenant is no country bumpkin—as a class he is probably the best raw officer material on the market today.

To make things as easy as possible, the Air University supplies its AFROTC cadets with an easy-to-understand booklet, *Briefing for Commissioned Service*, and most schools recommend the excellent *Air Officer's Guide* (Military Service Publishing Co., Harrisburg, Penna., $4), which covers the Air Force with encyclopedic thoroughness from "A—Abbreviated Effectiveness Reports" to "Z—ZI Armies."

In addition, classroom lectures and give-and-take discussions with AF instructors have made Second John

Lieutenant

By M/Sgt. Frank J. Clifford



Washington Post and Times Herald photo, by Heiberger

On parade at graduation time, George Washington University.

jokes as out of date as mustache cups. The formal briefings and the informal bull sessions are OK, but both systems have inherent faults. The formal lecture is too formal. The informal session gives the answers to men who don't know enough about the business to ask the right kind of question.

This little essay is intended to supply the answers to the unasked questions.

Probably the most important thing for the new lieutenant to learn is the language that lubricates the Air Force. This is a highly technical and formalized jargon that has grown to amazing dimensions in the past ten years. Though it is mainly a written language it can be spoken to some extent.

With a little practice and a keen ear our new lieutenant will be able to say, "I was on OD when I ducked into the Orderly Room to check my 201 to see if my AFSC was changed when the CQ told me my PCS was changed to TDY. This was all right by me because it meant I'd get TPA both ways plus a 'delay.' "

John Second Lieutenant's first brush with the language will probably come when he gets his orders to report to his first duty station. If he is normal the only thing he will be able to understand will be his name, rank, and serial number. The rest will be a bewildering mass of cryptic abbreviations and condensed words, laced with numbers and punctuation marks.

Official orders almost always have a distinct financial flavor and unless the new lieutenant understands every line of type on his orders he should consult someone who does. If he is

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LIEUTENANT——CONTINUED

still on campus when he gets his orders he will find his Rosetta Stone in his ROTC unit. Away from school, any Air Force or Army Recruiting Station or Air or Army National Guard outfit is the place to go for interpretation.

This is as good a time as any for John to get into the habit of reading all of his orders, paying sharp attention to dates. The complete story of abbreviations is in a fat little book, the title of which, *JANAP 169*, is a clue to what's inside. Section 2-6 is the AF part. A valuable tool for some, *JANAP* (Joint Army, Navy, Air Force Publication) is merely an interesting curiosity to most men.

With his orders untangled our John can report to his place of duty with a light heart—and on time. Frequently orders will state the reporting time as, "not earlier than . . . hrs or later than . . . hrs" of a particular day. The new lieutenant will commit his first mistake if he tries to make points by reporting a day early. This is a capital offense on bases which have a large volume of traffic in new officers. The Air Force wants our man when it wants him—no sooner, no later.

By allotting a specific time, base personnel are prepared to receive him, process him, and make him comfortable with the least amount of strain on everyone. The mechanics of reporting are all thoroughly covered in the two books noted earlier so we will skip the details.

If John is as smart as his diploma says he is, he will not have spent any considerable part of his uniform allowance *before* reporting for active duty. Most colleges outfit their advance ROTC cadets in uniforms of good quality and cut. Since a typical school year averages thirty weeks, and the uniform is usually worn only once a week, it will have been worn approximately sixty times in the two years he has it—almost a new uniform by active-duty standards.

This outfit is entirely satisfactory as an "extra" uniform. Once squared away with an organization he can get on-the-spot advice on where to buy what and how much to pay for it. By waiting until he lands on a base to make major purchases he avoids stocking up on winter uniforms only to have them serve as *hors d'oeuvres* for moths.

In the Air Force, there is no such thing as an "officers' uniform" *per se*. To be sure, there are tailor-made uniforms and uniforms made of gabardine and other fabrics, but these are not the exclusive property of officers. An

officer is well advised to supply himself with at least one custom-made outfit, but for everyday work Base Sales Store uniforms are good enough and have the added advantage of being foolproof as to color, style, and shade.

So much for the haberdashery. Our John has filtered through the processing system and is now in his Orderly Room where he presents his credentials. The Old Man greets him, introduces him around, and, like as not, John is measured for a coffee cup. He will be amazed at the cordiality of his reception.

This cordiality, dear John, is genuine.

But in spite of the red carpet, John Second Lieutenant should play it like a polite guest. He should reserve any display of his "personality" until he is no longer a novelty—sometimes weeks after he has joined. He should go easy on the jokes and wisecracks. Not that good humor is taboo—it's not—but in the flurry of first meeting a restrained attitude wears best.

Before too much time elapses the new officer should ask the Orderly Room staff to brief him on how to maintain a personal 201 file. This is one of the most important files a military man can compile and a good one will save him immeasurable time and correspondence. A good personal 201 reflects in unbroken continuity every matter of official record having to do with the man. Good personal 201s are valuable in substantiating claims, preparing supporting documents for promotion, and a host of other matters.

Uppermost in the mind of most Air ROTC cadets long before they are commissioned is the question, "How am I going to handle any troops assigned to me—especially the noncoms?" Scores of ROTC men have asked it of me.

The answer is not something that can be reduced to a formula. At best there is only a series of "do's" and "don'ts" and these are only as *good as the man who employs them.*

In the Air Force a new officer is generally allowed to mature a bit by understudying more experienced officers in a variety of jobs before he is put on his own. The AF does not expect a newly hatched officer to be a finished product capable of rolling up his sleeves and pitching in.

In spite of what he might have heard he should realize there is no inherent clash of interests between officer and airman. He can confidently expect a friendly reception and active cooperation. Unfortunately, new officers are sometimes braced to combat a hostile attitude that does not exist. The men in a work section are primarily interested in the job at hand and their place in it, and they regard a new officer as a co-worker rather than a taskmaster.

This does not mean that everything is hunky-dory and the skies are not cloudy all day. There are clashes, and they must be resolved. Trouble in a section can almost always be traced to one man, and he is easy to cut out of the herd. To do this as tidily as possible, ask him to report to you in your office. The book says this is to avoid fracturing his morale by a public reprimand.

However, the private pow-wow serves a more direct purpose by removing the man from where he might gain moral support and where he might put on an act of foolish bravado. This could lead to a situation wildly out of control and skidding toward insubordination. The man must be isolated from any possible implied support.

What about a clash that erupts suddenly, in full view of onlookers? Under no circumstances do you wrangle with the man. Nor do you pacify him. You retreat, with apparent calm, ordering the man to report to your office in a half-hour. This time lapse calms you down, gives you time to think things through and to obtain advice, if necessary. It also allows the man time to cool off, to meditate on his "sins" and to spare himself the danger of blowing his top.

As bad as "fighting" with an airman is to allow him to "get away with it." A discipline problem must be faced. It won't go away, it will only get bigger. Formal leadership is identified by symbols of rank but practical leadership goes to him who can command it. If an officer (or non-commissioned officer, for that matter) continues to tolerate a breach of good order he forfeits his leadership and it will go *to the man who broke the rules.*

This is leadership by default, and it is not mentioned in the book. The book takes no note of "captured" leadership. But it exists, nonetheless. Nature abhors a vacuum—if the "right" people do not lead, the "wrong" people will.

In actual practice the new lieutenant will rarely collide with a major discipline problem. His badge of office has real meaning and it is respected—provided the officer continues to merit it.

The booklet *Briefing For Commissioned Service* gives a hint when it says, "An officer should not issue orders which he cannot enforce. He should be as good as his word, at all times and in any circumstances. He should promise nothing which he cannot accomplish. It is a mistake for an officer, on taking over a new post, to order sweeping changes affecting other men, in the belief that this will give him a reputation for action and firmness. Studying a situation is the proper preparation for remedying it."

Which all means, "Slow down, John." You are new to the business and ideas which seem to you sure-fire and long-overdue probably have been tried before and found wanting. Money—"funds," to use a trade term—usually is the stumbling block. The newcomer

(Continued on following page)

should wait awhile before deciding that the Air Force is deliberately dumb and obstinate.

It is the right and duty of an officer to defend his men and to bring their grievances to the attention of those who can set matters aright. But the new officer should be on guard against the "snow man" who can plead a variety of causes with all the skill and mock sincerity of Long John Silver.

Before you snatch up the cudgel and rush into the fray, pause a bit to think the whole thing out. Discuss the case with your non-coms who will fill in details of procedure and fact. The non-coms know a lot of incidental details masked from an officer and what they know and will tell can often spare an officer a great deal of embarrassment.

When bringing a complaint to higher authority the young officer should beat down the urge to act as the fiery counsel for the "plaintiff." If he does, he will soon wind up with a grievance of his own.

The fear of making a mistake haunts almost every man new to a job —and a lot of old hands too. It sometimes approaches a psychosis. Our man wants to do right—or more accurately, he doesn't want to get chewed out for goofing an assignment.

This is the spur that will drive you to take personal charge of every little detail to insure that the "job is done right." Later, after you've run yourself ragged and ruffled a lot of feathers, you'll find out that you have NCOs quite capable of running the show. You'll also discover that the job is not as big or as demanding as you thought it was. When this happens you will be on the way to becoming an officer. You will have learned that your job is supervision and just that—super/vision: to "look over" the job.

Sometimes the fear of making a mistake can lead to a comedy of errors. Not only second lieutenants, but a goodly number of officers of all grades spend a lot of time mind-reading, trying to determine what results the Old Man wants to see. This leads to some weird, on-again, off-again maneuvering. If the truth were known, the Old Man has only a cursory knowledge of most routine actions and all he wants is an honest count.

But mistakes come, as they must to all men, to second lieutenants. Regard them as legitimate lessons, learned the hard way. The new officer who boots one should frankly admit it—he should never attempt to hide or minimize the true dimensions of a foul-up. Unless he is extraordinarily gifted, a new officer is not likely to accomplish a truly notable mistake.

One of the biggest, however, is to borrow money from an enlisted man. Airmen, particularly NCOs, are quite well paid today and many of them are a long, long way from the poor house. So far, in fact, that the kind of borrowing I am talking about is big league—big enough to finance a car, for example.

Sources of ready money in impressive amounts are available to officers and the second lieutenant who finds himself in a bind need only ask his CO how to go about getting what he needs—more often, however, he only thinks he *needs* it. Finance officers are very shrewd in deciding who *needs* money and who would *like* to have money.

Most ROTC officers do not intend to make a career of the Air Force and most of them admit it. And the vast majority pull their two or three years with commendable records. There are a few, however, who resent having to defer their splash into civilian life to detour through a hitch in the service.

This resentment is usually obvious. The second lieutenant who takes this attitude is headed down a rocky road, unwept, scorned, and miserable. Everyone has troubles, John, so keep yours to yourself. The only exception to this rule is to talk your problems over with a mature officer—and in private. Even so, it is not wise for an officer to bare his troubles indiscriminately.

The new second lieutenant's relationship with his NCOs is a matter of great delicacy, for the non-coms can make or break him. Truth to tell, the NCOs run the show. *Briefing For Commissioned Service* has this to say, "The non-coms are the men who actually run any Air Force unit. They know the airmen's desires and personalities, know the state of the unit's pulse, and often have far more practical information about the military than the junior officer will for a long time."

The new second lieutenant will be understandably bewildered at the large numbers of stripes. But this is only part of the story. You should quickly find out who is the "boss" NCO. The man with the most stripes is the likeliest suspect and the flat question, "Who's in charge here?" will settle any doubts. This does not automatically cancel out all the other NCOs but it does give the NCO-in-charge top billing and a bit extra.

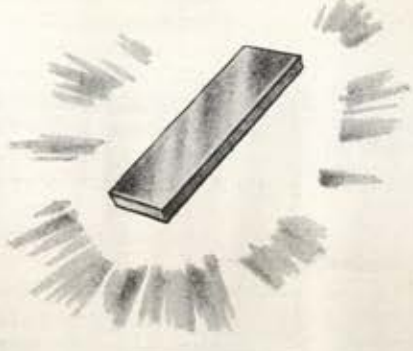
Trust your top NCO until proved otherwise and rely on his ability to make decisions. In a dispute ally yourself with the chief NCO until the facts decide the case. And since your non-com in charge is your right hand, you should take his word at face value. The NCOIC is the guy who sits up with the baby and he deserves a lot of leeway.

Remember that a master sergeant is an E-7 just as a colonel is an O-6; both are at the top of their heap while you're at the bottom of yours. The typical master sergeant is at least ten years older than you and was probably soldiering when you were in grammar school. Go light on the term "Pop" unless the name is commonly accepted by the man—and then only after you have been in "Pop's outfit" a reasonable length of time.

The NCOs will be your strongest supporters and your best training aid. If they *like* you they will do their best to help, guide, and protect you. The NCOs get to like an officer when he shows he has officer potential. They *do not like* him if he is a "good Joe," a hail-fellow-well-met, extravagantly lenient of sloppy work, or a casual passer-by on the military scene. Your NCOs have a right to expect you to be on active duty, mentally and physically.

The second lieutenant can take pride in the fact that he is an officer in the military service of the United States. He has a proud tradition behind him and he has been given the privilege of adding to its lustre. He may be the bottom man on the military totem pole, but it is a fact that the bottom man holds all the rest of them up.

One final tip—if you polish your brass bars vigorously and often enough, they turn to silver.—END



The author, a veteran AF non-com and now on ROTC duty at the University of Pennsylvania, is very well qualified to give new officers sage advice.

THE HIGH ARE THE MIGHTY

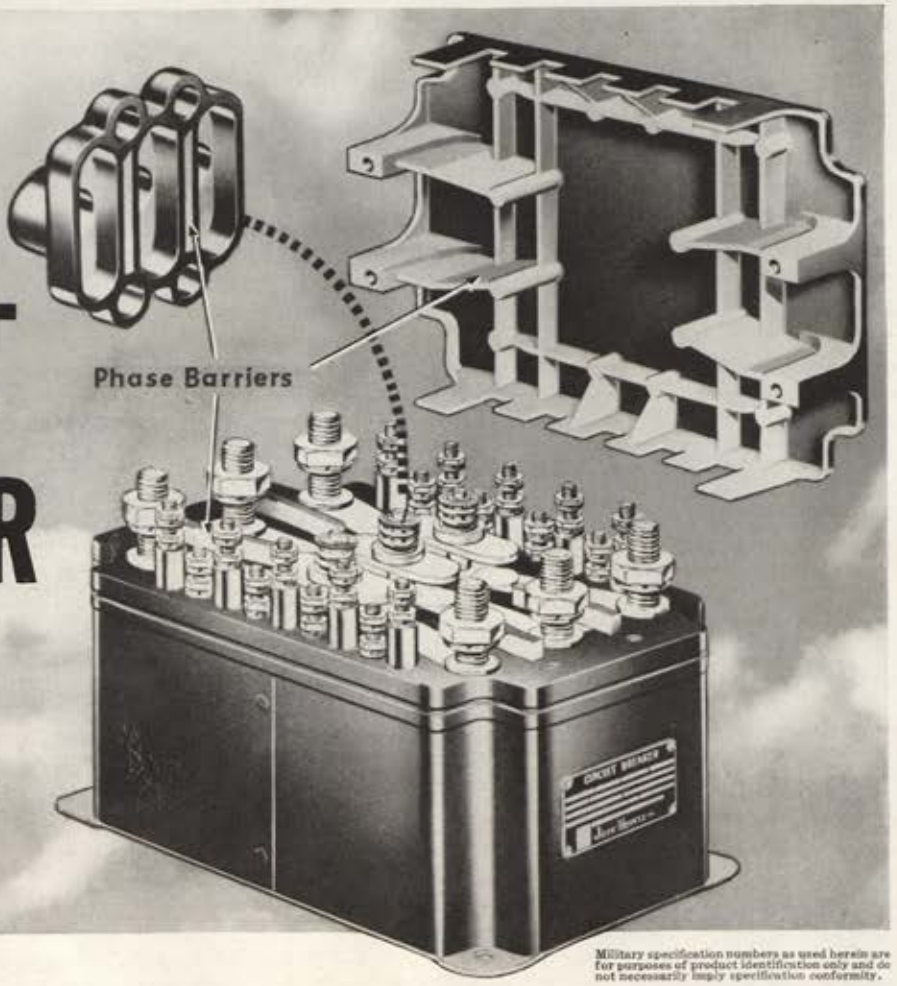
Altitude is power in aerial warfare. Leading U.S. jets fly higher, nourished by Lear-Romec fuel booster pumps. These service-tested pumps deliver tons-per-hour of vapor-free fuel, even at stratospheric altitudes where fuel boils in the tanks. That's quite a trick.

These first-line, high-altitude jets use Lear-Romec fuel booster pumps (available for both AC and DC operation).

LEAR LEAR-ROMEC DIVISION Elyria, Ohio

RO-14

NEW CIRCUIT BREAKER FOR A-C SYSTEMS



Military specification numbers as used herein are for purposes of product identification only and do not necessarily imply specification conformity.

Design features provide exceptional safety and ease of maintenance

This new Jack & Heintz Model 50086 Circuit Breaker is designed to meet MIL-C-8379A (ASG) . . . provides a continuous rating of 175 amperes (60 kva) . . . weighs but 4¾ pounds! Although an important part of the complete Jack & Heintz a-c system "package", it can be supplied as an individual unit if desired.

In addition to its main features described at right, this new breaker has many others that assure positive, trouble-free functioning under extreme environmental conditions. Here is another example of how Jack & Heintz continues to provide you with advanced electric systems and components through integrated engineering and manufacturing. For complete information write to Jack & Heintz, Inc., 17640 Broadway, Cleveland 1, Ohio. Export Department: 13 E. 40th St., New York 16, N.Y.

SAFETY FEATURES

Solid Copper Bus Bars
All bus bars are of solid copper. No flexible copper braids used!

Mechanical Phase Isolation
Straight-through path design of main conductors together with phase barriers permits complete mechanical phase isolation of all main conductors and contacts.

MAINTENANCE FEATURES

Easy Contact Inspection
As shown above, the special construction allows inspection of main contacts without disassembly.

Nylon Terminal Cover
Molded of high impact nylon, this cover can be removed easily by loosening four screws.

Accessible Auxiliary Contacts
All three connections for each auxiliary contact have been brought out to the terminal posts for ease of hookup.

ENGINEERS: Write for free booklet describing unusual opportunities for you at Jack & Heintz.

JACK & HEINTZ *Rotomotive* AIRCRAFT EQUIPMENT

AF navigation aid will beam signals 3,000 miles

On the BEAM

Navarho, a long-range navigation system slated to be built at Camden, New York, by ARDC, will guide planes in approximately the area shown above. The bearing and distance information to be beamed in all directions from the station will be especially helpful to pilots of fast, high-flying planes. If the station is a success, the AF plans more installations.

AIR navigation in the US, Canada, Mexico, and over the Atlantic Ocean should be made easier by a powerful new experimental radio station to be built by the Air Force. The station will employ a long-range system, called Navarho (pronounced "Nav-a-row"), capable of beaming bearing and distance information to planes as far away as 2,500 to 3,000 miles in all directions.

The system was developed under the guidance of ARDC's Rome, N. Y., Air Development Center. It will be installed at Camden, near Lake Oneida in northern New York State, and its signals will cover an area bounded by the West Coast, the Gulf of Mexico, the Azores in the Atlantic Ocean, and the Arctic Ocean.

According to Maj. Gen. Stuart P. Wright, Commander of the Rome Center, a pilot taking off in California will be able to tune in to the station and keep track of his position all the way to the Azores. Continuous signals to the pilot will tell him whether he is east, north, south, or west of the station and his distance from the station, enabling him to plot a direct course to his destination.

The facility will have three towers that will soar seventy feet higher than the 555-foot-high Washington monument and will use three fifteen-kilowatt transmitters. Accuracy of the Navarho signals will spot a plane within ten miles of its position even when it is as far as 1,000 miles from the station.

Jet pilots especially will welcome the new development. With the present radio ranges, a pilot flying at 600 mph can barely get tuned in to a station and calculate his position before he is out of range and has to retune to a new station.

If the experimental station proves itself in actual operations, a worldwide chain of similar installations is planned. It has been estimated that fifty of the stations could provide navigation aid to planes flying anywhere over the surface of the earth.—END

RENDEZVOUS

Where the Gang gets together

91ST BOMB GROUP (H) ALUMNI: I have received numerous letters concerning a get-together. Why not a preliminary get-together at San Francisco during the AFA Convention, August 11-14? I will be in place by the night of the 10th, and would like for as many of the Old Guard to rally around as possible in order to have a dry-run on a reunion which might reasonably be held at some Eastern point in the following year. All old-timers of Wray's Ragged Irregulars, Terry's Tigers, etc. from the original founding at MacDill in '42 to disbandment at MacDill are invited to meet me and formulate plans. Anyone having information of ex-members please write them at once. Invitation is to all officers and airmen of AAF Station 121, Air Ground, Aviation Engineers, Medicos and what have you. *Brig. Gen. Stanley T. Wray, Robins AFB, Ga.*

32D ADG SUPPLY SQDN. REUNION: GIs from the Hillfield, Utah, outfit of 1942 are invited to attend the reunion at Bucyrus, Ohio, on July 2-3. Bring the family—baby sitters available. Notify *Warren Starlin, Rt. 2, Bucyrus, Ohio,* or *Eugene F. Young, 5779 N. E. Circle Ave., Chicago 31, Ill.*

6718 WAC HQ PLATOON-MAAF REUNION: After ten years of civilian life for 99-44/100 of the group, the 6718 WAC Hq Platoon—MAAF are gathering in San Francisco August 10-14, 1955. All members who were in Italy from 1943 through 1945, be they Air-WAC or WAC, and those who knew us as a unit or individually are invited. Details from *Capt. Ruby A. Gage, 1503 Rockwood Dr., Rockville, Md.*

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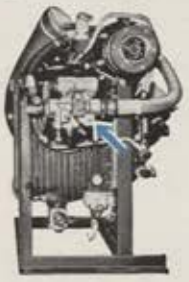

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Operating characteristics are remarkable. These motors will stop from maximum speed in from .116 to .167 of a revolution . . . will accelerate from standstill to maximum speed in from .00019 to .0051 sec (depending on size). They can be stalled indefinitely without damage.

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AFA's 1955 Convention and Airpower Panorama WILL PRESENT AVIATION'S 'HALL OF FAME'

SAN FRANCISCO

Headquarters:

Fairmont Hotel

Mark Hopkins Hotel

SEE PAGE 48 FOR HOTEL RESERVATIONS!

AFA's 1955 Convention and Airpower Panorama will be a star-studded event. The list of speakers and famous aviation figures who will be in attendance reads like a "who's who." Those persons whose pictures appear on the next page are only a few of Aviation's "Hall of Fame" who will be in San Francisco in August for AFA's annual get-together. More than fifteen hundred air-minded Americans will be present — it's the nation's biggest annual airpower meeting.

A few of the highlights of the Convention which will make attendance a must are:

- **The Airpower Panorama**—a city block of modern airpower exhibits, valued in the millions, portraying airpower of today and tomorrow. Convention registrants and military personnel in uniform will be admitted free. The public will be charged 50¢ admission for those over fifteen years of age. The Panorama will have a Hollywood-type World Preview Thursday evening, August 11, for Convention registrants, guests, and the press. The Preview program will include AFA's Annual Reunion Cocktail Party, previously held on Friday.
- **The Airpower Banquet** — at the world-famous Sheraton-Palace Hotel August 13 will feature an address by Secretary of the Air Force Harold E. Talbott, and the presentation of AFA's national airpower awards.
- **The Wing Ding Ball**—at the Fairmont Hotel atop Nob Hill August 12, will combine special Hollywood entertainment and fine music to make it a memorable occasion.
- **The Airpower Symposium** and **ARDC-AMC-Industry Forums** — August 11 and 12, will bring timely information of vital importance to the defense and security of our nation. General Nathan F. Twining will address the Symposium Luncheon.
- **A round trip for two to Hawaii** —via Transocean Air Lines, will be one of the many prizes awarded for attendance at the Convention.

REGISTRATION FEES

MEMBERS (Active-Service-Associate)	$20.00
LADIES (AFA Auxiliary & Visitors)	$20.00
NON-MEMBERS (Male)	$35.00
INDUSTRIAL	$35.00

Fees include: Admission to Panorama and Preview Reception, Wing Ding Ball, Airpower Banquet, Brunch and Memorial Service. Plus, Fashion Luncheon for the ladies, and ARDC-AMC Forums and luncheon for Industrial Registrants.

Harold E. Talbott
Secretary of the AF
Airpower Banquet speaker

Gen. Nathan F. Twining
USAF Chief of Staff
Symposium lunch speaker

Mrs. H. H. Arnold
Honorary Chairman
AFA's 1955 Convention

Lt. Gen. Leon W. Johnson
Commander, ConAC
Reserve Clinic speaker

Maj. Gen. William E. Hall
Ass't C/S, Reserve Forces
Reserve Clinic speaker

Brig. Gen. W. P. Wilson
National Guard Bureau
Reserve Clinic speaker

Lt. Gen. Thomas S. Power
Commander, ARDC
Industry Forum speaker

Gen. Edwin W. Rawlings
Commander, AMC
Industry Forum speaker

Miss Jacqueline Cochran
Noted aviatrix
Fashion Luncheon Remarks

George C. Kenney
AFA Board Chairman
Forum Moderator

James H. Doolittle
AFA Founder
Forum Moderator

John R. Alison
AFA President
Convention Host

PROGRAM

TUESDAY—AUGUST 9

AFA Golf Tournament	9:00 AM- 6:00 PM

WEDNESDAY—AUGUST 10

AFA Directors Meeting	8:00 PM-10:30 PM

THURSDAY—AUGUST 11

Reserve Forces Clinic	9:00 AM- 1:00 PM
AFA Leaders Meeting	9:30 AM-12:00 N
ARDC-Industry Forum	9:30 AM-12:00 N
AFA Leaders Luncheon	12:30 PM- 1:30 PM
USAF-Industry Luncheon	12:30 PM- 2:00 PM
First AFA Business Session	2:00 PM- 5:30 PM
AMC-Industry Forum	2:30 PM- 5:00 PM
Auxiliary Board Meeting	3:00 PM- 5:30 PM
World Preview of Airpower Panorama	7:00 PM- 8:15 PM
Panorama Preview Reception	8:15 PM- 9:30 PM

FRIDAY—AUGUST 12

First Aux. Business Session	9:00 AM-12:00 N
Annual Airpower Symposium	9:30 AM-12:00 N
Airpower Panorama Open	10:00 AM-10:00 PM
Ladies Tour of Fashion Shops	10:00 AM-12:00 N
Ladies Fashion Luncheon	12:30 PM- 2:30 PM
Airpower Symposium Luncheon	1:00 PM- 2:30 PM
Second AFA Business Session	3:00 PM- 6:00 PM
Second Aux. Business Session	3:00 PM- 6:00 PM
Unit Reunion Parties	6:00 PM- 9:00 PM
Wing Ding Ball	9:00 PM- 1:00 AM

SATURDAY—AUGUST 13

Third AFA Business Session	9:00 AM-12:00 N
Final Aux. Business Session	9:00 AM-12:00 N
Airpower Panorama Open	10:00 AM-10:00 PM
Unit Reunion Luncheons	12:00 N- 2:00 PM
Final AFA Business Session	2:00 PM- 5:00 PM
Annual Airpower Banquet	7:30 PM-10:00 PM

SUNDAY—AUGUST 14

V-J Day Memorial Service	8:30 AM- 9:45 AM
Annual Airpower Brunch	10:30 AM-11:30 AM
Installation & Awards Ceremonies	11:30 AM-12:30 PM

SEE PAGE 48 FOR HOTEL RESERVATIONS!

Memorial for General Vandenberg

DETROIT SQUADRON HOLDS RITES FOR LATE CHIEF OF STAFF AT ARLINGTON CEMETERY

On April 3, at Arlington National Cemetery, Washington, D. C., members of **Detroit's Vandenberg Squadron** sponsored a **memorial service** for the late **Gen. Hoyt S. Vandenberg.** The efforts and cooperation of several individuals and offices made the program possible.

Maj. Gen. Richard A. Grussendorf, Tenth Air Force Commander, who made the arrangements for transportation, was among those at the service. **Chaplain (Colonel) C. W. Marteney** delivered the memorial address. A color guard and bugler were obtained through the cooperation of USAF Headquarters Command, **Brig. Gen. Stoyte O. Ross,** commanding.

The Headquarters Command Information Services Officer, **Capt. William H. McQuinn,** was indispensable in coordinating the affair.

Phillip Rosenberg, Vandenberg Squadron Commander, headed the group that flew in from Selfridge AFB that morning. After luncheon at the Bolling AFB Officers Mess, the group was taken to Arlington for the memorial services.

Mrs. Hoyt S. Vandenberg attended the services (see cut, below) and expressed her gratitude to the Air Force Association for the ceremony honoring the former Chief of Staff, who was a member of AFA's Board of Directors at the time of his death in 1954. Distinguished visitors at the service included General and Mrs. Leigh Wade, General and Mrs. Idwal H. Edwards, General and Mrs. K. E. Webber, and Willard W. Millikan, AFA Regional Vice President, along with several members of the Capital Squadron.

The **Baltimore Squadron**—AFA's oldest chartered unit—recently sponsored an **education program** aimed at the young people of Baltimore. Under the direction of **Squadron Commander Bill Reber** and **Meir Wilensky,** a group of thirty-seven local high school students spent a day going through the facilities of the Air Reserve Center, Harbor Field, and Friendship Field, and heard the advantages of an Air Force career as outlined by **Maj. W. A. Van Blaircum,** Chief of the Air Force Academy Appointment Branch.

Col. J. A. Gibbs, liaison officer at the Center, started the day with a formal welcome to the students, and then accompanied the group on its tour. Interest was high among the boys in the group as to the qualifications for Academy appointments.

SQUADRON OF THE MONTH

Since the issue of May '52, this space has been used to call attention to some outstanding program sponsored by an AFA Squadron. For the first time in more than three years no Squadron has distinguished itself sufficiently, over and above normal activities, to be "Squadron of the Month." We hope this situation will prompt enough programs to enable us to have at least ten candidates next month.

California's First Reserve Squadron, Long Beach, recently honored several **outstanding Reservists** in the Long Beach-Los Angeles Harbor area with a dinner at which **Arthur F. Kelly,** past AFA National President, was the principal speaker.

Brig. Gen. Joseph Marriott, Col. Charles A. Rose, Col. Alfred S. Howell, Col. Thomas E. McLeod, and Col. Thomas Wiper were the officers whose **accomplishments and service** the Squadron recognized.

Kelly addressed the group on the extreme importance of the **USAF guided missile program.** He also paid tribute to all Air Force Reservists, a

(Continued on page 105)

Jimmy Stewart and June Allyson, co-stars of Paramount's new picture, "Strategic Air Command," with AFA Director James McDivitt at the AFA-sponsored premiere of the film April 28 in Los Angeles.

Mrs. Hoyt S. Vandenberg, Maj. Gen. R. A. Grussendorf, 10th AF Commander, and members of the Vandenberg Squadron, at memorial service for the late AF Chief of Staff (see text).

New officers of the Taunton, Mass., Squadron discuss unit activities. From left, Crawford Archer, Stephen Tetlow, Robert Ramsay, Dennis Martin, and Roland Potvin.

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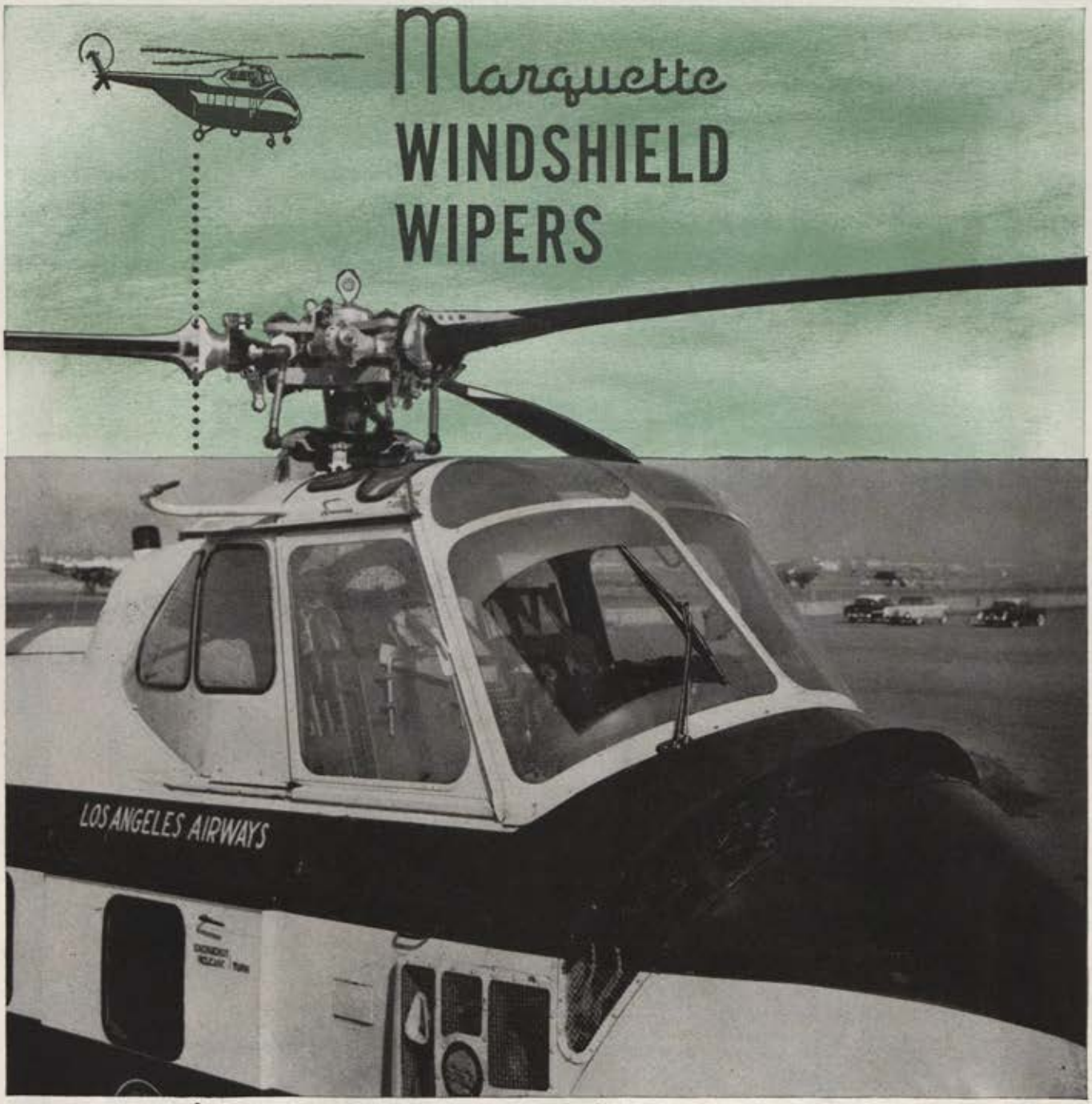

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SPRING CLUTCHES

subject with which he is familiar through his service on the Air Staff Committee for Reserve Policy.

Other guests included Mayor and Mrs. George Vermillion, Long Beach; Mayor and Mrs. Emil Hautley, Signal Hill; and Vice Mayor Gene Nedeker, Lakewood. Floyd Damman, Commander of the Squadron, was program chairman. John Bainer, Joanne Affronte, and Dick Trevor served on the committee.

Annually, one of the outstanding AFA social events in the **Chicago area** is the **dinner-dance** sponsored by **Squadron 101,** at which its new officers are formally installed. This year's affair was held in the swank Tam O'Shanter Club, and as usual tickets were sold out far in advance. Some 150 members and guests turned out for the eighth edition of this program.

Ralph B. Jones was re-elected Commander, and he and his fellow officers were installed by **George A. Anderl,** AFA Director and a past Commander of the Squadron. Other honored guests were Wing Commander **John Carr** and Mrs. Carr, who is an Auxiliary Vice President and Chicago Group Commander Leroy Kwiatt.

At an Executive Council meeting held in Baton Rouge on April 24, the **Louisiana Wing** made plans for its **first Wing convention,** to be held in Shreveport May 28-29. **Fred O. Rudesill,** Wing Commander, presided at the meeting, which was held in the Heidelberg Hotel.

Plans for the convention call for a luncheon on May 28 at nearby **Barksdale AFB,** for the purpose of introducing the distinguished guests who are present, followed by a briefing on AFA for the members of the Chamber of Commerce Armed Services Committee, and then a reception, banquet, and dance. **Lt. Gen. Emmett O'Donnell,** Deputy Chief of Staff for Personnel, USAF, is to be the banquet speaker. On Sunday, a general business session will be followed by a luncheon.

The girl, if a caption's necessary, is Beverly Wright, named as Santa Monica, Calif., Squadron's entry in the Mardi Gras Queen competition.

Those at the planning meeting, in addition to Rudesill, were Clyde Hailes, Vincent Caruso, Michael Kirk, John B. Pugh, George B. Dean, Dr. L. R. Savoie, Dr. Dimitri Filostrat, S. S. Snyder, Clarence E. Cone, and Gus Duda, representing AFA Headquarters. As a result of the meeting, the formation of several additional Squadrons and Flights in the state is con-

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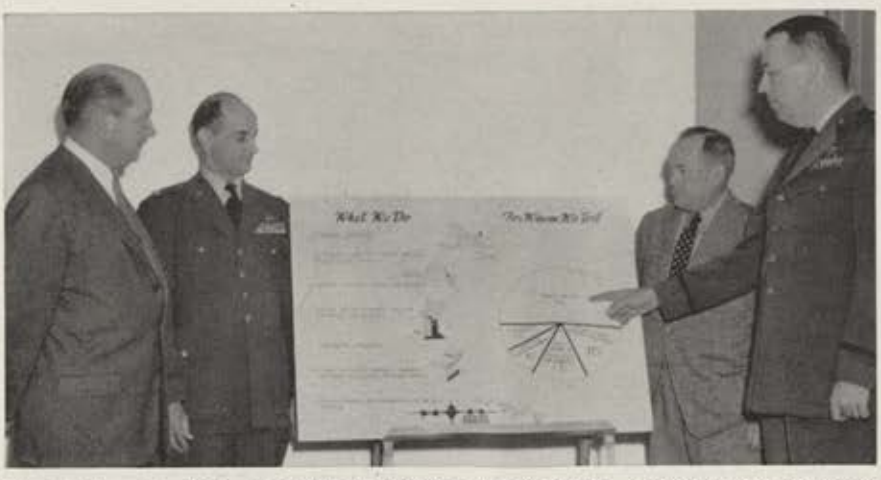

Harold Lawson, Maj. Mark Treat, 2234th ARFC Cmdr., Regional V-P Thomas Stebbins, and Base Commander Col. Sheplar Fitzgerald, Jr., discuss the mission of L. G. Hanscom AFB, Mass. Lawson is AFA Hanscom Squadron Cmdr.

templated before the meeting in Shreveport.

Another **new California Squadron**—number sixteen for that state—was chartered at the Wing convention in Fresno last month. Tentatively named the **Los Angeles Metropolitan Squadron,** its membership is made up of Los Angeles Reservists.

Carl Alford, 1212 Elm Ave., Glendale, is the commander. William Gacke is Vice Commander; Leon O'Brien, Secretary; and Paul Kennedy, Jr., Treasurer. Councilmen are Harrison Rice, Richard Falconer, John Williams, and Richard Richonne.

Meetings are planned for the **fourth Friday of each month,** and Alford extends an invitation to all members to take part in the airpower activities of this newest member of AFA's strongest Wing.

City Director A. Ray Benedict of **Pasadena, Calif.,** has asked, "When are we going to have a **heliport?**" He threw out this question at a directors' meeting called in response to a letter the city had received from the **Pasadena Squadron.**

Mayor Clarence A. Winder instructed City Manager Don McMillan to survey various firms to find out their plans for establishing helicopter service, since, as he put it, "Whatever is needed, we should take steps to get a heliport for Pasadena."

In the letter from the AFA Squadron, **unit commander Ozro Anderson** had pointed out that Pasadena "is recognized as having a greater percentage of its citizens flying commercially than any other US city."

CROSS COUNTRY . . . **John T. Allen,** Atlanta organizer, reports the new Squadron there all set to get fired up. All area members are urged to get in on the ground floor.—END

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Harris & Ewing

Fighter aircraft in World War I

A ten-year-old goes to war

By Len Morgan

This is Len Morgan's third offering for us. The others were "Those Were Beautiful Planes" (September '54) and "The Day the Balloon Went Up" (December '54). An airlines co-pilot, flying out of Dallas, Tex., he served in the RCAF in World War II before transferring to the AAF. One of his hobbies is collecting old aviation books.

THE airplane was only ten years old when it first went to war. A clumsy, fragile curiosity, built of wood and linen and held together by glue and wire, it was one of the most unlikely devices ever submitted to the rigors of battle. It was costly to make, maddening to keep in repair, dangerous to fly. Hours of painstaking maintenance were rewarded with two or three short hops around the field and then it was back to the sheds for more adjustments, testing, and pampering.

The worst feature of the 1914 "aeroplane" was the cantankerous nature of its power plant. One day it would start with the first flip and run like a well-oiled sewing machine and the next it would disdainfully ignore the coaxing—and insults—of every mechanic. Even when everything seemed to be running perfectly, it often gave up without warning, leaving its unhappy pilot with but one direction of travel for the rest of his flight. You couldn't depend on it for a minute.

Military leaders found it difficult to fit aviation into their schemes for making war. There was only one thing about the entire hit-and-miss proposition that interested them at all, and that was the simple fact that a man could see a great deal more of the landscape from the air than he could from the ground. Observation. As the Duke of Wellington had wistfully remarked a century before, victory belongs to the general who can guess what's happening on the far side of the hill. There was no trick in elevating an observer, for aeronauts had been ballooning about Europe for decades. But a plane, and *only* a plane, was able to carry him out to a specific point of interest, keep him there long enough to take notes, and bring him back to tell what he had seen. At least, if all went well it could.

So, when war came in August 1914, the antagonists mustered their tiny air forces and ordered their pilots into the air to play whatever small role they could through the approaching course of events.

Flying in World War I! What stirring aerial scenes that brings to mind. Spads wheeling in formation to meet an onslaught of Flying Circus pilots knifing down out of the sun in their blood-red Fokker D-7s. A crisp winter sky echoing the scream of wing wires and howls of Mercedes and Hisso engines at full throttle. The sporadic rattle of Vickers guns ripping off short bursts at twisting, frantic targets. Thirty little fabric-covered biplanes caught up in a dogfight to the death two miles above the Western Front, their freezing young pilots trying desperately to claw each other out of the air. Yes, that was the way we've heard it from the old-timers who survived those first great air battles. But not so fast. The first months of World

American pilots flying French Nieuports return from patrolling the Tour sector in April 1918.

War I were not like that at all. While builders rushed to their drawing boards to create more efficient and dependable craft, pilots had to make do with their rickety prewar machines and get on with the job at hand. Sounds like 1939 in England, doesn't it? Or 1941 in the Pacific. Or 1950 in Korea. There is a difference, however, for in World War I there was an excuse for it.

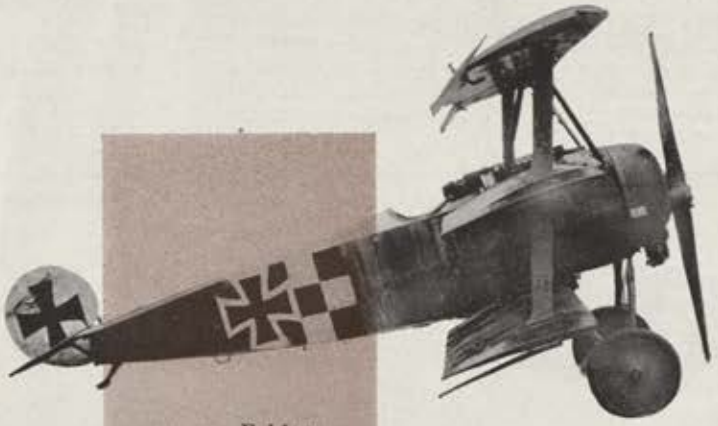
Before the war was three weeks old the clumsy new recruit showed itself to be a weapon of tremendous importance. A Royal Flying Corps airman, nursing his crate towards enemy lines, peered over the side of his cockpit. He saw a long column of men and trucks, moving along a road below *away* from the area of fighting. Quickly marking his map, he dived for home to report that the French Army had broken on one flank and was in full retreat. Thus alerted, British elements were withdrawn in time to prevent encirclement, and the enemy was cheated of a chance to wipe out the British Expeditionary Forces. From then on there were rarely enough airplanes available to satisfy the demand for observation. The day of guessing about the other side of the hill was gone forever.

The scope of aerial activity broadened rapidly. Under the loose heading of "reconnaissance," scores of specific scouting duties were conceived and executed. No previous war had seen field commanders so well advised about the disposition of enemy forces, the size and location of his fortifications, ammunition and food dumps and, most important of all perhaps, changes being made in these aspects of surface combat. Dispatches from the rear were dropped within minutes at isolated forward positions; artillerymen, watching the purposeful antics of a plane above, laid shells on unseen targets with uncanny accuracy; high-ranking officers were flown over enemy trenches to make bird's-eye appraisals of the situation.

Pleased with having found something useful to do, pioneer military airmen sought still more ways of making their flimsy craft true weapons of war. It took little imagination to see the possibilities of bomb-dropping, and foot soldiers were soon keeping a careful eye on every plane that came near. One of the most novel "bombs" was a wicked little gadget invented by the French, the *flechette*, a steel dart six inches long and about as thick as a pencil, with fins to make it fall straight. Dumped over the side by the boxful, it depended for its effectiveness on a direct hit every time. Records tell of a dart which hit a cavalryman and passed through his steel helmet, his body, and his horse before burying itself in the dirt.

Unarmed British and French airmen roamed above German territory at will, made their notes and returned to base, their chief concern being the unpredictable whims of their engines. But it worked both ways. The Germans enjoyed the same immunity. Opposing pilots sometimes waved as they passed on the way to work. Enemies? Yes, but brother airmen too and besides, neither had the means to harm

(Continued on page 111)



Fokker Triplane

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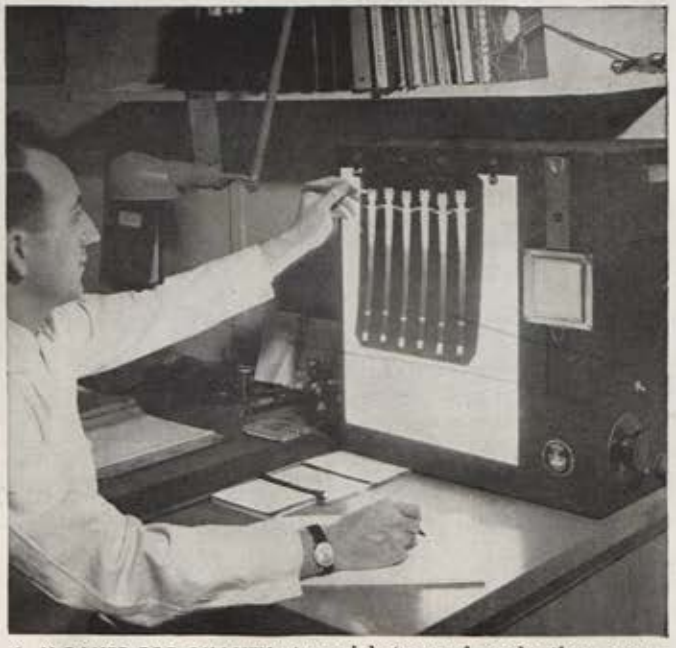
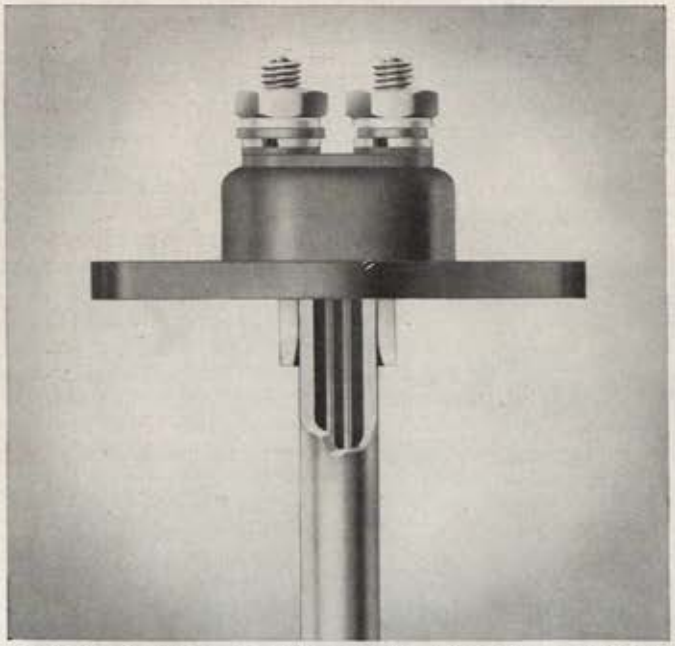


2. X-RAYED FOR QUALITY at crucial stages of production, every Fenwal Thermocouple also undergoes further exacting tests for dependability. These include calibration inspection against Government Standards, double-checks for insulation resistance throughout operating temperature range, flame tests to assure fast, accurate response for extra safety in flight.



3. EXCLUSIVE "BELL MOUTH"* within the collar of Fenwal Thermocouples cushions and spreads vibration strain and eliminates high point-of-stress concentration. This means longer Thermocouple life. It is but one of many *Fenwal firsts* evolved during Fenwal's custom-engineering of *over 40 special types* of thermocouples . . . each *precision-engineered* to engine manufacturers' specifications for peak performance.

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the other. The new advantage of having eyes in the air was shared by both and thereby became no real advantage to either. So pilots soon began carrying sidearms and rifles to shoot at the enemy when flight paths crossed. Hand grenades and even bricks were tossed through the air in the wild hope of wrecking an opponent's ship, and some accounts of early war flying actually credit two victories to brick-throwing pilots.

Light machine guns came next, but it was immediately apparent that no man could maneuver into position and aim a hand piece at the same time. With two-seaters the story was sometimes different, however. Pilots pulled up alongside each other, allowing their rear-seat men to exchange broadsides, battleship-style. This form of action could be joined only when the enemy chose to fight, and either crew could end the battle simply by flying away. It was a most unsatisfactory way to wage war. What was needed was a machine so armed that its operator could stalk his prey, take him by surprise and force a fight.

Roland Garros, pioneer French aeronaut, came up with a solution. He mounted an automatic rifle on the hood of his Morane monoplane so that it fired forward through the propeller arc. To aim he simply steered toward the intended victim. Metal cuffs were screwed to the blades to deflect bullets that happened to fire when the prop was in the way. The way it worked out, about seventy percent got through the prop without striking. A primitive application of a revolutionary principle, but it worked. Garros knocked off a number of Germans and some historians claim he was the first "ace," but his real claim to fame was the forward-firing gun. Then engine failure downed him on the wrong side of the front and the great secret fell into German hands.

Among the engineers called in to examine the Morane was a young plane builder named Anthony Fokker. A Dutchman by birth, Fokker had offered to work for the Allies but his designs were "too expensive." The British and French were to rue the day they had turned him down. He had just started to work for the German Air Force when Garros made his unfortunate deadstick landing. Fokker saw the possibilities of Garros's device. But he knew that the real answer was a mechanism which would permit the trigger to fall only when prop blades were clear of the line of fire. The Dutchman solved the riddle in a few hours and had a small plane of his own design fitted with a synchronized weapon within a week. The gun fired perfectly, bullets streamed out between unprotected prop blades, and a French recce job was sent spinning almost before its surprised crew realized there was an enemy plane on their tail.

Everything else in the air became obsolete overnight. The pattern for aerial combat had been set for the remainder of the war and it was the same general pattern upon which fighter tactics are based to this day.

Curiously enough, this first of all synchronized-gun fighters was a monoplane. The colorful era of biplane pursuits had yet to commence. Fokker's E-1 was little more than a private sportplane with an army paint job—and it flew like one. Lateral control was obtained through the antiquated system of wing warping, an indication of its obsolescence. Structurally weak and underpowered, it was a mediocre creation even by 1915 standards. Many of its numerous victims fell through sheer ignorance, never dreaming until too late that E-1 pilots carried anything more than a pistol. For weeks the little craft chattered about the sky, shooting down most of the targets they ran across and generally having things their own way.

Fitted with an eighty-hp rotary engine, the E-1 flew at somewhat better than a mile a minute, straight and level, and carried enough fuel for 120 miles of flight. Gunnery was controlled by a button on the stick. Cockpit equipment included a large mapboard, rear-view mirror, altimeter, mag switch, and the various valves and pumps required to insure a steady fuel flow, one being a glass flowmeter which showed the actual trickle of fuel to the engine. Such was the first of all practical pursuits, the seed from which our present supersonic fighters have sprung. Fighter aviation as we think of it today became a distinct branch of military air activity the day young Fokker's "menace" rose to seek its first fight.

For six months the E-1 (and subsequent souped-up versions) kept the dread secret safe for Germany while Allied engineers wrestled with the problem of synchronization. Fokker soon had a three-gun model in action, powered by a 160-hp, twin-row engine of eighteen cylinders, in reality two of the original rotaries bolted together. Across the lines, pusher types were pressed into front-line service simply because they posed no problems in the mounting of fixed forward arms. But they had little on the E-1 when the chips were down and observation outfits continued to scream for more and better protection.

New airplanes were rushed into production in a hurried effort to return the air situation to a more satisfactory state of balance. Notable among them was the Nieuport 11 in which the gun headache was neatly sidestepped by securing a .30 caliber Lewis to a framework above the top wing so that it fired above the prop. A trim, almost dainty little number, the 11 was very light (1,200 pounds ready to scramble

(Continued on following page)

Spad 13—it flew to fame in aerial scraps.

Sopwith Snipe—from a proud, fighting family.

Sopwith Camel—called a delight to fly.

Nieuport—12 equal one F-86's weight.

with pilot aboard), reasonably stout when roughly handled and nimble enough to give the E-1 crowd a stiff dose of their own medicine. American pilots of the famed Lafayette Escadrille flew it during their first months in action.

The 11 was not exactly what it appeared to be, a biplane, but actually a wing-and-a-half idea, the upper wing providing about twice the lifting area of the lower panels combined. It had a top velocity of 100 mph and a climb rate, from the deck to 10,000 feet, of 600 feet per minute. It could land, roll to a complete stop and take off again in a space just ten times its own length! Later versions boasting more power soon followed to further impress the Huns with the general idea that the E-1 picnic was over. Nieuport fighters, or "chasers" as they were then called, were employed in large numbers throughout the war and listed as front-line weapons almost until the Armistice. Best known of all models was the 17, similar to the 11 at first glance but with swept-back wings and 130 hp under the cowl. Billy Bishop was among the score of Allied pilots who wrote air history with this sensitive little mount.

All Nieuport designs were inclined to shed wing fabric when dived to high speeds—175 mph or more. This was a built-in hazard which cheated pilots of victories that would have been certain in stouter craft. The first all-American unit to fight in France, the 94th Squadron, was originally equipped with the Nieuport 28, a 160-hp job of classic lines and noteworthy performance, but even this late model lost fabric under speed and had to be held in check continuously. Photos of early fighters are quite misleading in that they fail to indicate many of the changes that have been wrought in design over the years. It would have taken a flight of twelve Nieuport 28s to equal the weight of one North American F-86. But the Nieuports could do the job.

By late 1915 Allied airmen owned a respectable piece of the disputed air, and a two-seater crew enjoyed a sporting chance of returning to earth with its machine still more or less in one piece. About this time an E-1 pilot landed by mistake at a French airdrome and the synchronized gun secret was out. Garros and Fokker had provided the means for aggressive aerial warfare. Nieuport had contributed the style of airplane required for the deadly new art. The first air war was rapidly taking shape.

German aircraft builders thrived on competition. Just as the balance of airpower seemed to tilt in favor of a new French or British pursuit, up would roar a fresh challenge from east of the lines, haughtily displaying black Maltese crosses on wings and rudder, and show itself to be a hair snappier in the climb or tighter in the turn. That the glamor boys of the Kaiser's air force knew well how to wring the last drop of performance from everything they got is clearly indicated by a look at their ace list. No less than forty-seven of them dropped twenty or more of their foe.

Well-remembered among their excellent single-seaters (at least, in quarters where World War I is a favorite topic) is the Albatross in its several models, the D-1 through the D-6. Here was a ship of the most advanced order, a startling piece of streamlining. From prop spinner to tail skid, the fuselage was moulded for speed and revolutionary in construction, being plywood-covered instead of the fabric-over-framework arrangement that was the standard of the day. Mercedes water-cooled engines of 160 hp and up were used with success in the series, twin Spandau guns being the usual armament. But performance was disappointing in view of such clean lines and the power available. The famed D-3 of 1917, for instance, made 114 mph with everything up to the firewall and gained altitude at less than 1,000 feet per minute. The modern airman is sure to wonder why the combination did not add up to better totals. This is an impression gained after studying most World War I types. In outward configuration early pursuits seemed little different from the numerous successful biplanes of a few years ago (Waco, Stearman, Travelair, etc.) that met such high standards of reliability and performance. This was mere surface resemblance, the stuff under the skin being in some cases as different as black and white.

We have only to recall the trial-and-error nature of plane manufacture in those days to understand the failings of its products. Not until late in the war was a builder able to start off with a list of requirements and come up with something close to what was needed. For the most part the contour and weight and assembly of a new model were dictated by educated guesswork and the limited variety of raw materials at hand. Most model builders of today know as much about basic aerodynamics as the men who put the first fighters together. That some of the craft born under such conditions not only flew, but flew well, is the amazing thing and a real tribute to the ingenuity of those who had a hand in their development.

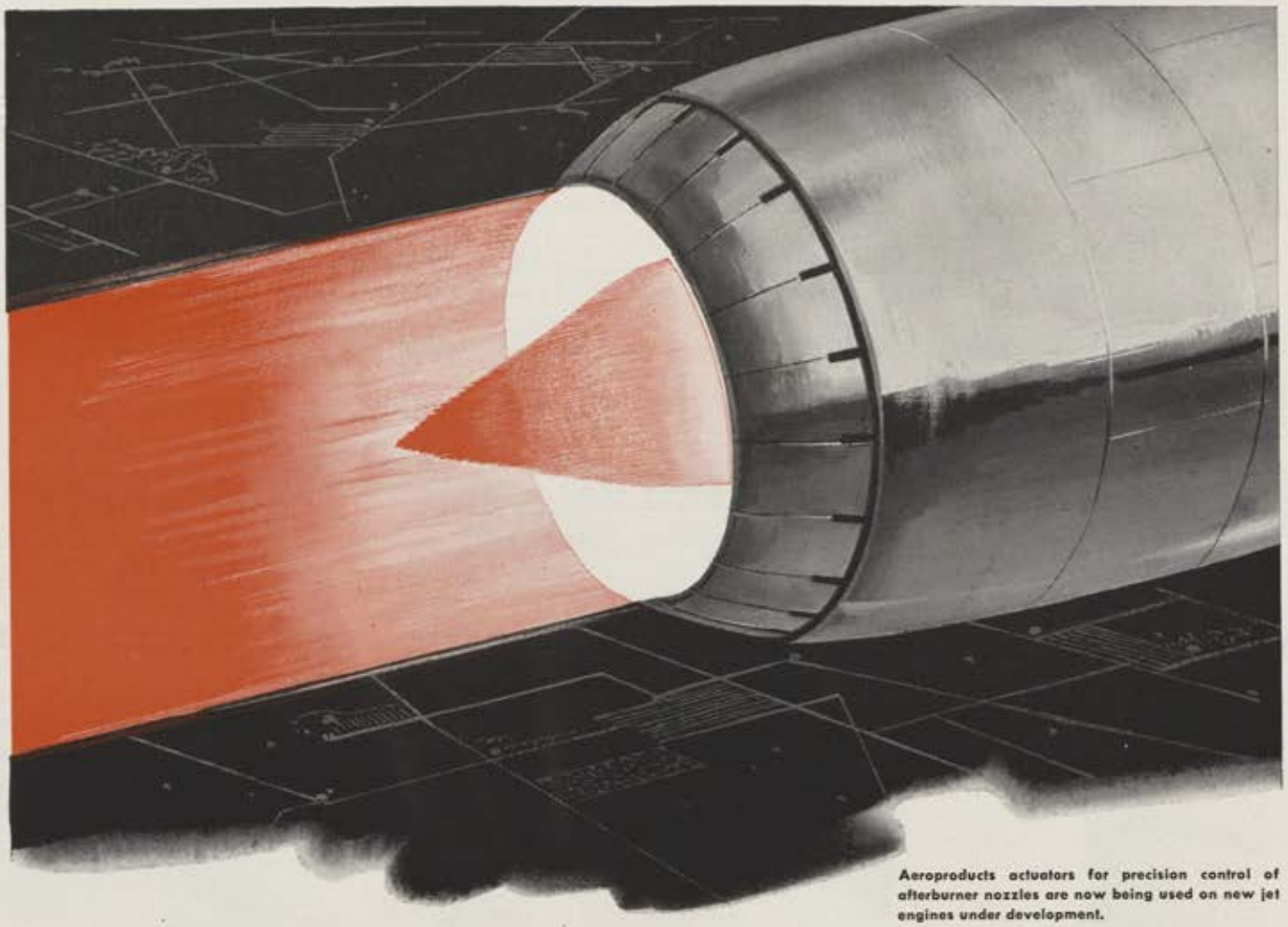
Like the Nieuport, the Albatross was plagued by structural weakness—fast dives pulled the wings off. While many pilots are reported to have flown it under protest, Albatross fighters carried many a sharp lad high into the ranks of aces. Baron Manfred von Richthofen, whose eighty-plane score was the highest of the war, flew most of his missions in one. At the same time he was one of its most outspoken critics and led a group which demanded investigation of its shortcomings.

If any one name brings to mind the flying action of those eventful years, that name is "Spad." More correctly, it should be written, "S.P.A.D.," for

(Continued on page 115)

The easily flown Fokker D-7 first appeared in mid-1918 and from then until the end of the war seriously challenged Allied air supremacy all along the Western Front.

Pilot and observer sat back-to-back in the Bristol F.2B Brisfit, which is generally conceded to have been one of the finest all-around fighting machines of World War I.



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U.S. AIR FORCE

the word originated as the abbreviation of *Société Pour Aviation et ses Dérivés*, its French creators. S.P.A.D. was headed by a trio of proven experts, Bleriot of cross-channel flight fame; Bechereau, who designed trophy-winning racers before the war; and Birkight, a Swiss who masterminded Hispano-Suiza motors for automobiles. Here was a combination that couldn't miss.

Of the several single- and two-seaters delivered for the Allied cause, the Spad 7C-1 (Model 7 Chaser, one seat) was outstanding in its prime. In fact, it was radical in concept, with paper-thin wings and a completely enclosed engine. With Birkight's 205-hp aero engine installed, the 7C-1 could do better than 125 mph, climb to 10,000 feet at 1,300 feet a minute and, thanks to Bechereau's sound engineering, stand anything its pilot was man enough to try. It was trustworthy in tight spots, including extended dives to high velocity, an advantage delighted pilots pressed to the limit when pursuing craft known to have structural limitations. They will tell you that Spads sometimes came home with wires sagging from excessive strain but always with the wings still in place. Almost 7,000 were built, testimony of the hearty welcome it received at the front.

The Spad 13, beefed-up to take a new 235-hp Hisso, was ordered to the tune of 8,000 units. This was the great ship that flew to fame in a thousand lofty scraps and on into the stirring yarns, printed and filmed, that gave the flying itch to many an imaginative boy too young to have flown it himself. The 13 weighed nearly a ton ready to go (about equal to a Cessna 170), climbed to 7,000 feet in five minutes flat, and charged along at 140 mph wide open. If he wished, its pilot could top 23,000 feet, which may sound a lot higher than the average level of combat. But reports turned in during the last months of war tell of frequent patrols at 16,000 feet and up, and of dogfights involving as many as sixty planes which began at such heights. And all without oxygen, of course.

Flying in that day was a miserably uncomfortable business. To begin with, all planes had open cockpits, and only those who have flown "outdoors" can fully appreciate what it must have been like to fly a patrol at 15,000 feet during a typical French winter. In some ships this meant sitting with head and shoulders exposed to the raw slip-stream. In all of them it added up to a cold ride because little had been learned about the tricks of flowing air and ways to make it curve around a windshield. Helmet, goggles, and heavy face mask failed to prevent a man from freezing half to death.

Planes were built of wood and covered with doped fabric. They would burn like a straw broom, and one hot slug through the tank was often all it took. Cockpits were bare, with no practical instruments for bad weather flight and no radio with which to alert a wingmate when the enemy was closing in on his tail. Armor plating, bullet-resistant glass, self-sealing fuel cells, gun heaters, electric suits, cockpit pressurization, radar sights—all of these were luxuries reserved for the future. In World War I you flew without a 'chute and had no choice, when controls went soft or smoke streaked back from a ruptured tank, but to fall in the wreckage or, as sometimes happened, jump clear of a flamer. Had the refinements and safety features known to modern fighter pilots been available then, those lightweight early pursuits couldn't have lifted the extra pounds without losing much of their punch. Their effectiveness depended on being stripped to guns and a pilot.

Two outstanding British single-seaters were the Royal Aircraft Factory's Scouting Experimental Model 5 and the Sopwith Camel. The SE-5 was one of the finest looking products of the war, if not *the* finest. With the right man on the stick it was certainly one of the most respected. It had an extra something in a clinch that made it a favorite with pilots. Typical arms included a .30 caliber Vickers firing through the prop and a semi-flexible Lewis on the top wing, so mounted that it could be aimed almost straight up at the belly of a ship overhead.

First models flew on 150-hp Hissos and improvements quickly followed in the form of power increases up to 220 hp, which was absorbed through a seven-foot, nine-inch diameter, four-bladed prop. The cockpit was located nine feet aft of the prop, well clear of the top wing to afford a high degree of visibility, and was appointed with such niceties as a tach, oil pressure and temperature gauges, turn-and-bank indicator, and a clock. Wingspan: twenty-six feet, eight inches; over-all length: twenty-one feet; gross weight: 1,775 pounds. Extreme strains were known to pull wings off but such reports were not frequent.

The Sopwith concern put out a string of first-class fighting craft—the Tabloid, 1½ Strutter, Pup, Tripe (triplane), Camel, Dolphin, Snipe, and Salamander. But it is the stubby Camel for which T. O. M. Sopwith's early efforts are best remembered. Equipped with rotaries of from 100-150 hp, the Camel was possessed with vicious torque and was dangerous in the hands of a fledgling. Experienced pilots found it a delight to fly, however, and a superb combination of speed and maneuverability. It was every inch a great fighter.

Flying behind a big rotary engine is something most of us know nothing about, the modern jet pilot not even being troubled with propeller torque. The Clerget 130-hp rotary weighed almost 400 pounds, and most of it rotated at 1,200 revolutions per minute with the prop! Only the crankshaft was fixed to the airframe. Everything else—cylinders, pistons, rods, crankcase—were free to turn with the prop. While modern cowling is designed to facilitate engine cooling and streamline the nose area, the main idea with rotaries was to catch the oil that flew from the whirring cylinder bank. As it was, pilots had difficulty keeping goggles and windscreen clear of the dirty film. The gyroscopic action of a heavy rotary made itself felt in several ways. With the Camel there was a tendency to enter an outside loop when the ship was dived vertically. Proper use of the rudder neutralized the effect, but the uninitiated who horsed back on the stick were liable to find themselves in inverted flight with the wings collapsing downward.

The final version of the Spad was the model 16, a two-seat fighter that first appeared in June 1918.

Camels officially accounted for 1,294 enemy aircraft downed. Only the Hawker Hurricane of World War

(Continued on following page)

II shot down more. (Hawker Aircraft, Ltd. is, fittingly enough, the successor to the old Sopwith firm, with Mr. Sopwith himself as one of its present directors.)

One more British type is deserving of attention, the Bristol F2-B, known among Allied airmen as the "Brisfit." Although created to fill the need for a two-place observation ship, the F2-B turned out to be ideal for bombing, photo work, training—in fact, the "Brisfit" could do anything. Most surprising of all, it was a top-notch fighter. A big ship, by World War I fighter standards, the "Brisfit" had a thirty-nine foot, three-inch wingspan and a gross weight of 2,800 pounds. Its fuselage was suspended between the wings so that it derived lift from the total area of both panels. By no stretch of the imagination was it a good-looking airplane. Normal power was provided by a Rolls-Royce 250-hp "Falcon III" and absorbed by a two- or four-bladed wood prop. More than 3,000 "Brisfits" rolled off the assembly line between the spring of 1917 and the end of the war.

Anthony Fokker did not fade out of the picture along with his precedent-setting E-1. Far from it. Busy throughout the hostilities, he supplied his German bosses with a brace of the finest craft they ever bought: the Dr-1 Triplane and the excellent D-7.

Fokker's "Drei-decker," as pilots dubbed the Dr-1, was probably the most maneuverable pursuit ever built and one of the most revolutionary. In a day when airplanes were built of wood the tiny triplane appeared with a welded metal fuselage and cantilever wings. Air officers turned it down for fear that it would fall apart under pressure, and it was withheld from service until Fokker reluctantly agreed to add interplane struts. But there was none of the maze of wing wires so common to other craft of the period. Only a hundred or so ever saw combat, but these claimed victories at the rate of three to one. Their pilots included twenty-two-plane ace Herman Goering, and the redoubtable Baron von Richthofen. In fact, the Baron was out after his eighty-first victim in his scarlet Triplane when Camel-flying Capt. Roy Brown shot him down.

The D-7 couldn't have been delivered at a more opportune moment for the Germans. It was mid-1918, and things were looking pretty bad on the eastern side of the lines. Allied pilots in their SE-5s, Camels, and new model Spads were clobbering most of the recce crews who tried to scout enemy positions. The D-7 was just the medicine needed. During its six months in the thick of it, Fokker's latest proved superior to anything else thrown up against the Allies. It exacted a heavy toll during the Germans' desperate last-ditch stand and might well have approached the Camel's record had surrender not grounded everything in November 1918.

Long a favorite with modelers, the D-7 is claimed by many to have been the finest looking of them all. Like in the Dr-1, cantilever wings and metal body framework were employed. A 160-hp Mercedes was fitted in most cases, the coolant being circulated through a radiator mounted auto-fashion, ahead of the engine. A manually-operated shutter was provided to permit regulation of airflow through this cooler. A pair of Spandau guns made up the fire power. Both ships featured a wing-shaped spreader bar between the landing wheels, evidence of Fokker's inventiveness, the idea being to make the axle produce lift as well as drag.

How did the engines of World War I stack up? They were heavy, low-speed, low-compression machines that performed well and reliably considering the conditions of altitude, temperature, and stress to which they were subjected. Five to one was high compression in 1918; most production models were about four to one due to the low quality of fuels available. With few exceptions, propellers were directly driven from crankshafts, holding rpm to 1,500 or less. Rotaries in some cases developed a horsepower per two pounds of total weight, but a four-to-one weight/horsepower ratio was not considered bad for water-cooled plants. In comparison, the engines of World War II turned up to 3,000 rpm for take-off on compression ratios of seven to one and delivered a hundred horsepower for a hundred pounds of engine weight.

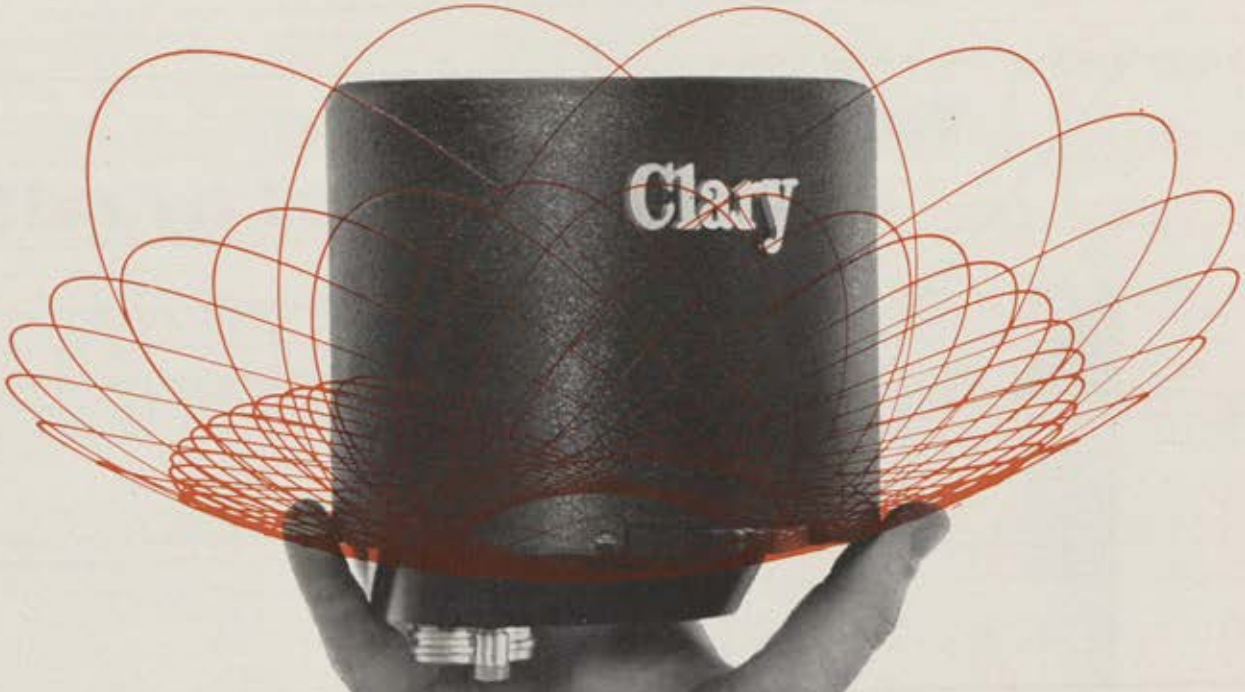
So publicized were the breath-taking exploits of early fighter pilots that the real significance of their lofty battles was lost to most of the public. They appeared to be engaged in a sort of private feud which, while tremendously exciting, really had little bearing on the muddy skirmishes being fought by doughboys and Tommies. But the dogfights between Spads and Fokkers were struggles for control of air spaces in which observation and spotting crews could function unmolested. Reconnaissance squadrons went doggedly about their unspectacular but hazardous duty throughout the war. Hundeds of thousands of photographs were taken, the British alone often making 1,500 or more exposures in a single day. Strafing had its effect on morale in forward trenches. Bombing was far more frequent and successful than most reports from France indicated. Had the war lasted another year, the heavy industries of Germany would surely have come under fairly intense air attack for hundreds of enormous biplanes capable of lifting a 1,500-pound missile were under construction when it all ended. That military aeronautics were vital was best demonstrated by the howl of dismay that went up from both armies whenever weather kept everything grounded for a few days.

The record of the first air war years is impressive in two main respects, one of which is the amazing progress made in aircraft design in such a short period. The faltering sportplanes in which the earliest scouting missions were flown were succeeded, in a space of just four years, by true fighting craft. By late 1918 Sopwith had a souped-up Snipe ready for production which scrambled for altitude at 2,300 feet per minute and sped along at two and a half miles a minute, a far cry from the Cub-like Morane and Fokker E-1! And we can be sure that the Dutchman would have provided a mount of his own with which to meet this new threat, had the Armistice come later.

Secondly, it is equally amazing to discover how many of our present fighter ideas had their origin before 1919. An enterprising pilot of 1917 bolted four Lewis guns to the undercarriage of his deHavilland BE-12B, transforming it into the first of all multi-gunned fighters. Cannon were used with success as early as 1915, when the French hung a hand-loaded 37-mm. gun on the nose of a Voisin pusher. Capt. Rene Fonck, seventy-five-plane ace of the French air service, knocked off eleven Germans with

(Continued on page 119)

The Royal Aircraft Factory's SE-5.



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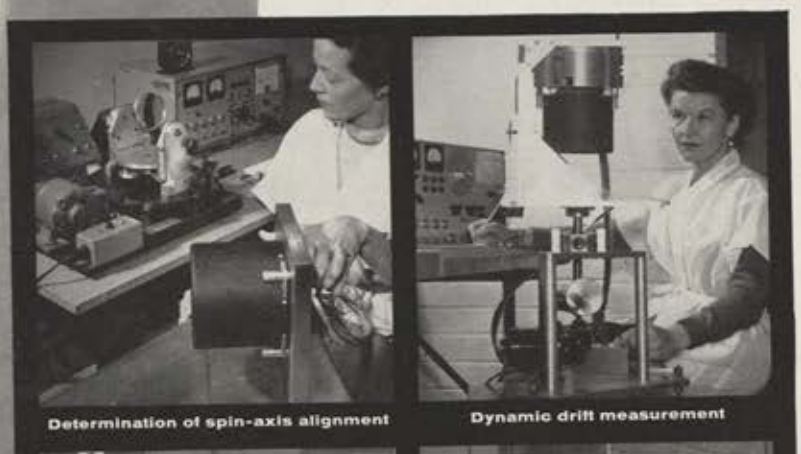

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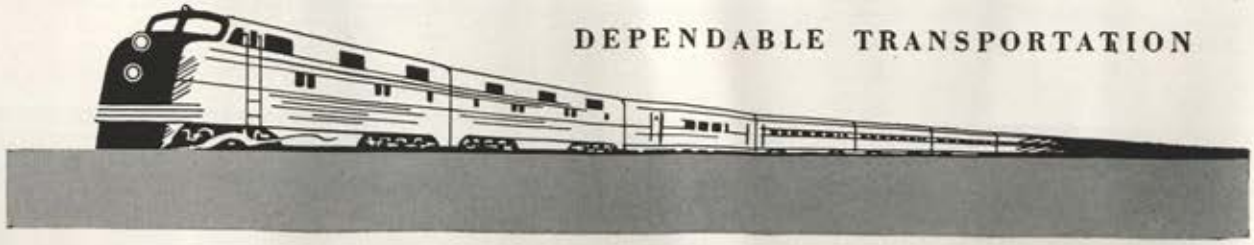

his experimental Spad 13 which contained a 37-mm. weapon firing through a hollow prop shaft. Spad two-seaters were fitted with huge searchlights and sent out after dark to find unlit ground targets and kite balloons—forerunners of the night fighters. Armor plating was often used to protect observation crews from ground fire during low-level flight.

Crude wing flaps and brakes were tried in efforts to shoehorn "hot" ships into short fields. Bold plans for an airborne paratrooper invasion of Germany were in the talking stage by 1918. Ground-support principles employed in Korea were first put to the test on the Western Front. Carrier aviation was born in 1911 when a Curtiss pusher flew from the *USS Pennsylvania* to shore and back. The possibilities thus suggested were further exploited by the Royal Navy in 1918 when a formation of Camels, each rising from a barge towed by a warship, dropped down on the Zeppelin sheds at Tondern on the North Sea coast and plastered them with a ton of bombs. Returning to sea, they landed alongside the ships and were hauled aboard by crane. Flotation gear was standard equipment of these Sea Camels and they could be folded up for easy storage.

Rockets, puncture-proof fuel cells, drop tanks, engine superchargers, heated flying suits, and oxygen equipment were among the numerous devices for better fighter performance that reached the testing stage. At least they were handed down for future thinkers to perfect. The importance of mobility was recognized in World War I. Crack German fighter outfits were often ordered to fresh locations along the line to reduce the time and fuel used to get out where they were most needed, one reason they became known as "Flying Circuses." Pilots themselves made the description all the more appropriate by decorating individual ships with gaudy paint schemes. The list goes on and on, clearly pointing out early military aviation as the very solid base on which all of today's modern airpower is founded.

Anyone who has taken time to acquaint himself with this fascinating era is apt to feel annoyed at the careless way it is often dismissed today. "Stick and wire crates—liable to fall apart anytime," you hear. Or, "A thrilling game, but it had no effect on the outcome of the war."

According to history, at least, the airplane did pretty well for a green recruit.—END

THIS IS AFA

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