



# AIR FORCE

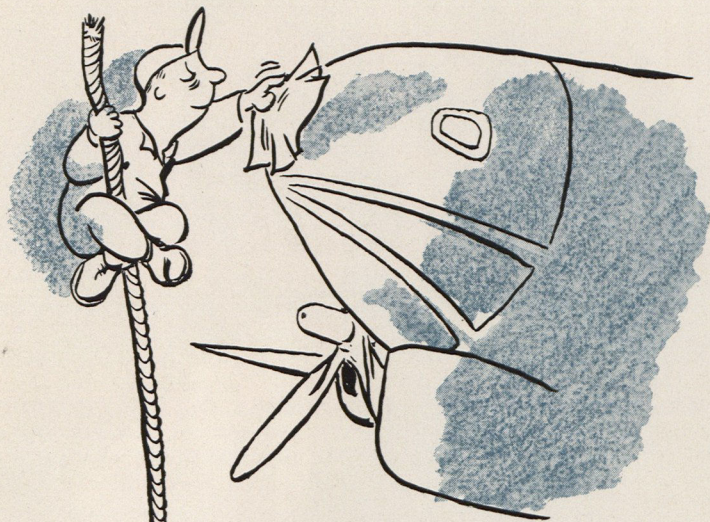
THE OFFICIAL SERVICE JOURNAL OF THE U. S. ARMY AIR  MAY 1946



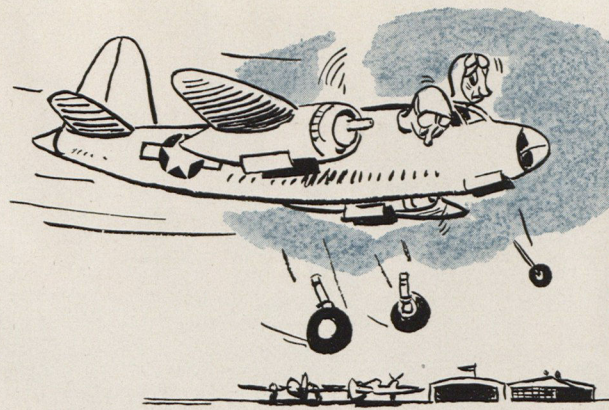
SANTRY

P-84—THUNDERJET





"He's always trying to impress people."



".... Gear down!"



# AAF SKETCH BOOK

"Tell me more about all those P-47's you fly, Dear!"

by Pvt. Peter Plasencia  
Air Force Staff



"He says he can't stand heights."



Peter



# Rendezvous

Vol. 29 No. 4

May, 1946

## AIR FORCE

THE OFFICIAL SERVICE JOURNAL OF THE U. S. ARMY AIR FORCES

### DFC Cluster Pay

Dear Editor:

In case a fellow has been awarded the Distinguished Flying Cross with clusters is he to be paid only for the original or for the original plus the clusters. I have the DFC with two clusters so am I to be paid \$2.00 per month or \$6.00?

S/Sgt. Oscar J. Sitzes  
Army & Navy General Hospital  
Hot Springs, Ark.

*S/Sgt. Sitzes should be paid \$6.00 per month for his DFC and two clusters. Furthermore, if he is on flying status he is entitled to collect \$9.00 per month. Pay accruing to enlisted men for the various distinguished service awards is included as "pay" in the computation of the 50% increase for aviation duty. (AR 35-1500)—Ed.*

### Bonus Problem

Dear Editor:

Questions have arisen among several officers relative to Regular Army commissions and the \$500 a year bonus for rated officers. These questions are:

1. Is it possible for a rated officer eligible for the bonus, who has made application for a regular commission, who has gone through the screening process, and who has had his papers forwarded to Washington, to refuse a regular commission when and if it is offered him, and on release from active duty collect the \$500 a year bonus?

2. If an officer cannot refuse a Regular Army commission and still collect the bonus, can he recall his application any time before regular commissions are offered so that his bonus will not be jeopardized when he returns to inactive status?

Maj. Emil W. Kontak  
La Junta, Colorado

*Upon acceptance of a commission in the Regular Army or upon being selected for a Regular Army Commission, an Air Corps Reserve Officer loses his eligibility to receive the lump sum payment. He also loses eligibility if he refuses to accept a Regular Army Commission when selected.*

*Any person who desires to withdraw his application for a Regular Army Commission should address his desire for withdrawal to The Adjutant General, Washington, D. C. (Par 3, AR 35-3420)—Ed.*

### AAF Enlistment

Dear Editor:

Kindly send me information on the possibility of entering the AAF. I would like information on the following: Is college training a part of the program; how long must my enlistment be; will I get a commission following my training?

J. P. Fortier  
Yale Station  
New Haven, Conn.

*A number of technical schools are operated for members of the Army Air Forces, but there is no program in existence at the present time which includes actual attendance at a college or university. Under the*

(Continued on Next Page)

- |   |                            |    |
|---|----------------------------|----|
| <b>Photographing the "Big Bang"</b>                                 | Charlotte Knight           | 4  |
| AAF will shoot enough film in 4 seconds to make 4 Hollywood movies  |                            |    |
| <b>Medicine in the Sky</b>  | Capt. Harry H. Ransom      | 6  |
| AAF School of Aviation Medicine—its accomplishments and objectives  |                            |    |
| <b>Unshackling Shanghai</b>   | 1st Lt. Lawrence T. Gordon | 8  |
| Lifting a Chinese army into Shanghai was more than a transport job  |                            |    |
| <b>Air Scouts</b>   |                            | 11 |
| Under new program Boy Scouts of America will "be prepared" to fly   |                            |    |
| <b>Airfields, Germany</b>   | Capt. Aaron Hotchner       | 12 |
| The rebuilding of 33 German airfields required 70 million man-hours |                            |    |
| <b>Crash Rescue</b>   |                            | 14 |
| More men died in ground crashes during the war than in air combat   |                            |    |
| <b>Global Weather</b>   | 1st Lt. Harmon H. Harper   | 15 |
| With airborne weather stations world-wide forecasting is possible   |                            |    |
| <b>Foreign Fledglings</b>   |                            | 18 |
| In the interests of lend-lease the AAF educated many Allied fliers  |                            |    |
| <b>The AAF Tells Its Story</b>                                      |                            | 20 |
| History of the Army Air Forces was written while it was still hot   |                            |    |
| <b>Europe a Year After</b>  |                            | 21 |
| Air Force correspondent reports on Europe after full year of peace  |                            |    |
| <b>The AAF Comes of Age</b>   | Capt. H. P. Andersen       | 22 |
| ATC's Atlantic Division commands all Army troops on Atlantic bases  |                            |    |
| <b>Rockets Over New Mexico</b>                                      |                            | 26 |
| How the AAF plans to send German V-2 rockets 100 miles above earth  |                            |    |
| <b>Army Calls for Skilled WACS</b>                                  |                            | 28 |
| Honorably discharged enlisted women can reenlist in Regular Army    |                            |    |
| <b>Airborne Symphony</b>  | Irving Kolodin             | 36 |
| Marc Blitzstein captures the spirit of the AAF in words and music   |                            |    |
| <b>The Disturbin' Turbine</b>                                       |                            | 44 |
| Now it can be told—the technique of jet turbine maintenance         |                            |    |

## DEPARTMENTS AND FEATURES

- |                           |    |                      |    |
|---------------------------|----|----------------------|----|
| <b>How Sharp Are You?</b> | 2  | <b>Cross Country</b> | 29 |
| <b>Technique</b>          | 37 |                      |    |

**Authorization**—AIR FORCE (formerly the Air Forces News Letter) is printed monthly by authority of AAF Reg. 5-6A (24 Jan. 1945) under the immediate supervision and jurisdiction of the Chief of Air Staff, Headquarters, AAF, and with approval of the Bureau of the Budget, Executive Office of the President.

**Publication**—AIR FORCE is published by the U. S. Army Air Forces at the AIR FORCE Editorial Office, 52 Broadway, New York 4, N. Y., U. S. A. Director and Editor: Lt. Col. Herbert O. Johansen, AC.

**Communication**—Direct communication with the AIR FORCE Editorial Office is authorized on editorial and distribution matters. Address: AIR FORCE Editorial Office, 52 Broadway, New York 4, N. Y.; telephone HANover 2-5200; teletype No. NY-1-2782. Washington office at Hqs. AAF, Washington, D. C. (telephone Republic 0700, Ext. 74362). Branch office at Wright Field, Dayton, Ohio (telephone Kenmore 7111, Ext. 29135).

**Participation**—AIR FORCE is primarily a medium for the exchange of ideas and information among Army Air Forces personnel. Readers are encouraged to submit articles, short subjects, photographs, art work. All contributions will be given consideration; suggestions and criticisms are welcomed. Opinions, expressed by individual contributors do not necessarily reflect the official attitude of the Army Air Forces or of the War Department. Material appearing in AIR FORCE is not to be reproduced without written permission.

**Distribution**—AIR FORCE is distributed in bulk shipments on a pro-rated basis to all units of the Army Air Forces throughout the world, in the United States according to the provisions of AAF Letter 5-14 (24 October 1944), and overseas in accordance with theater policy.

☆ U. S. GOVERNMENT PRINTING OFFICE—658352—PRINTED IN U. S. A.



## Rendezvous

(Continued from Page 1)

**GI Bill of Rights** an individual who enlists for three years, prior to October 6, 1946, is entitled to 48 months college education at time of discharge.

Current War Department regulations permit enlistments for 3 years, 2 years or 18 months. One-year enlistments are permitted for men who are now in the Army and have at least six months service.

The AAF is operating an Officers Candidate School on an extremely moderate scale. Candidates are selected from present AAF enlisted personnel on a competitive basis.—Ed.

### AAF Discharge Emblem?

Dear Editor:

How can I obtain an AAF Discharge Pin? I was discharged at Ft. Dix, N. J.

and received only the regular insignia. Charles J. Ross  
1577 Carroll Street  
Brooklyn, N. Y.

To date, no lapel button (discharge emblem) other than the regulation "eagle" has been authorized for wear by former members of the AAF.—Ed.

### Gifts to AAF Aid Society

Dear Editor:

Is it possible for a small, informal non-com club to donate its remaining funds to the AAF Aid Society as of the date of its dissolution?

Sgt. James O'Donnell  
Mitchel Field, L. I.

Yes. According to AR 210-50, Par. 17, 13 December 1945, donations may be made to the AAF Aid Society from "sundry funds," such as funds of officers, non-commissioned officers and aviation cadet clubs.

The donations are made in the name of the organization. The check should be made payable to the Army Air Forces Aid Society and may be forwarded either to the base Aid Society office or to the AAF Aid Society, Washington 25, D. C.

### Knots or Knots per Hour?

Dear Editor:

Reference "Rendezvous" in March-April issue, page 3. Will you please furnish S/Sgt. Geo. Heaton, Hq 8th AF, Okinawa, who claims to be mad at the world, with the following:

For hundreds of years a "knot" has been commonly referred to as a nautical mile, which is a measure of distance, not speed. A knot is approximately 6,080 feet and a land mile 5,280 feet, so if a plane is traveling at 200 knots per hour, its ground speed is about 230.3 mph.

Lt. Richard C. Neidinger  
Malone, N. Y.

## How Sharp are YOU?

This photo shows a trio of Air Service Command mechanics making rush engine repairs on a fighter plane at night. Can you look at it for 60 seconds and remember what you have seen? After you've finished, turn to page 35 where you'll find 10 questions. Count 10 for each one you get right. 70 is average; 80 pretty good; 90 excellent; and 100 perfect.

**HOW SHARP ARE YOU? . . . . Turn to Page 35**





## Thunderbolt before Lightning

Dear Editor:

Here is an answer, somewhat delayed, to "Lightnings in the Sky" which AIR FORCE published in December, 1943. I flew two tours, one with the 5th Air Force before it was officially named the 5th and the other with the 8th Air Force. I was a tail gunner most of the time, and at the present am mighty thankful for being unemployed.

*I have just read a poem that said  
That a P-38 is the best;  
Maybe that's right, but for my escort flight  
A Thunderbolt beats all the rest.*

*A P-51 is a son-of-a-gun  
That tackles all Jerries in sight,  
But a P-47 'way up in the heaven  
Makes my mission a little more bright.*

*If the fellows that fly 'em are as eager as I  
am  
They'd all stay at home every day  
But when there is trouble, they come on the  
double  
And chase Jerry out of our way.*

*No more do I wail as I fly in the tail  
With my thoughts very close to high  
heaven  
Now I sit here at rest with my feet on my  
desk  
Thanks to a P-47.*

Lt. Lewis L. Coburn,  
Lowry Field, Colorado

## Questions and Answers

Dear Editor:

A discussion has arisen here among a number of officers on the following subjects:

1. Under present regulations, a 1st or 2nd Lieutenant who has been in grade 18 months or more at the time he enters terminal leave may be promoted to the next higher grade. Suppose an officer goes through Separation Center on January 15 and January 16 starts his terminal leave, of which he has 60 days. On February 26 he completes 18 months in grade. Can he be promoted as of January 15 or February 26 or at all?

2. If an officer graduating from OCS was recommended for two duty assignments but never performed duties in one MOS, which has now become critical, can he be held in the Army under that MOS?

Lt. Harry Bennett  
Walla Walla AAB, Wash.

1. When an eligible officer completes required time in grade or required time in active service during his period of terminal leave, he should send complete details and WD AGO Form 66-1 to The Adjutant General, who will issue his promotion order on the proper date. In the case cited above, February 26. No retroactive promotions and no antedated orders will be issued. (Paragraph 5, WD Cir. No. 10, 11 January 1946).

2. The retention of an eligible, non-volunteer officer is based solely on his present duty and not on his MOS number. In no case will he be held beyond June 30, 1946. (AAF, PMP, 15 March 1946)—Ed.

# In This Issue



In the year that has passed since V-E Day the AAF has undergone many changes and today it is planning safeguards of peace. Evidence of such planning is to be found in this issue under such heads as "The AAF Comes of Age," "Global Weather," "Photographing the Big Bang," and in the "Technique" section. Europe, too, has changed after a year of peace. AIR FORCE correspondent Capt. Aaron Hotchner watched that change and before embarking for the States took one final look around. On page 21 he writes about some of the things he saw.

The cover is an air-brush portrait of Republic's new fighter, the P-84 Thunderjet, in action far above the clouds. Our art chief, Capt. Philip Santry, visited Republic's plant at Farmingdale, L. I., where he saw the Thunderjet and obtained material to help him paint the cover picture.

A neophyte to the Army but not to art is Pvt. Peter Plasencia, whose cartoons decorate the inside front cover. Private Plasencia, 20, was in the third year illustration course at a prominent art institute when inducted six months ago. He spends much of his free time on weekends at Mitchel Field where he gathers ideas for cartoons and illustrations.

Another addition to the AIR FORCE staff is Lt. Lawrence Gordon whose story, "Unshackling Shanghai," appears on page eight. Formerly a navigator with ATC, Gordon made 26 Atlantic crossings and 12 trans-Pacific flights. He was on one of the crews that flew Allied dignitaries to Berlin for the Potsdam conference.

Our roving writer, Charlotte Knight, has again visited New Mexico, this time to give you a peep into the shutters and darkrooms of photo crews which will record the atomic explosion at Bikini. For the latest information on speed photography, read her story on page 4. While in the Southwest she also gave us a report on testing V-2 rockets, page 26.

## PICTURE CREDITS

Pages 24-25, from top to bottom: 1, 4, 10—James Whitley; 5, 9—Harry Day; 7—Reg Abbott. Pages 26-27: US Ordnance Dept. Page 32: Ad-Vo-Pic, Inc., Mt. Vernon, N. Y.

All other photographs in this issue were secured through official Army Air Forces and Signal Corps sources. Requests for prints and photographs for official use and publication should be directed to the AAF Photographic Library, Headquarters, AAF, Washington 25, D. C. All other requests must be forwarded to the original source.

Capt. H. P. Andersen, a former B-17 pilot and an unwelcome guest of the Nazis for two years, reports on a new peacetime responsibility of the Air Force in "The AAF Comes of Age," page 22. His aircraft destroyed by fighters during an unescorted raid on the Lorient sub pens, Andersen parachuted into occupied France on April 16, 1943. A magazine editor and news reporter before enlisting in the AAF, he came to AIR FORCE in March from a PRO assignment in the AAF Training Command.

Before our correspondent Lt. Harvey P. Yorke left Tokyo for the US and relief from active duty, he visited the 5th Air Force to see how it was getting along as part of the occupation force in Japan. His report appears in "Cross Country" under the head "Peace! It's Wonderful!"

How an AAF helicopter carried observers over the spreading lava of a rampaging volcano is described in "Paracutin Mission," a "Technique" item. The story was written by Lt. Carl R. Hart, veteran of 68 missions as a B-24 pilot in the Pacific and now AIR FORCE staff representative at Wright Field. By providing us with the latest information from the Air Materiel Command, Lieutenant Hart helps us to keep you informed on what's new in the AAF each month.

"Global Weather," page 15, was written by Lt. Harmon H. Harper who joined the AIR FORCE staff in February. He is a product of OCS, Miami Beach, and a graduate of the AAF Intelligence School at Orlando as well as the Counter-intelligence School at Camp Holabird, Md. Lieutenant Harper is an historian in civilian life and came to AIR FORCE from the AAF Intelligence Library, Orlando, Fla.

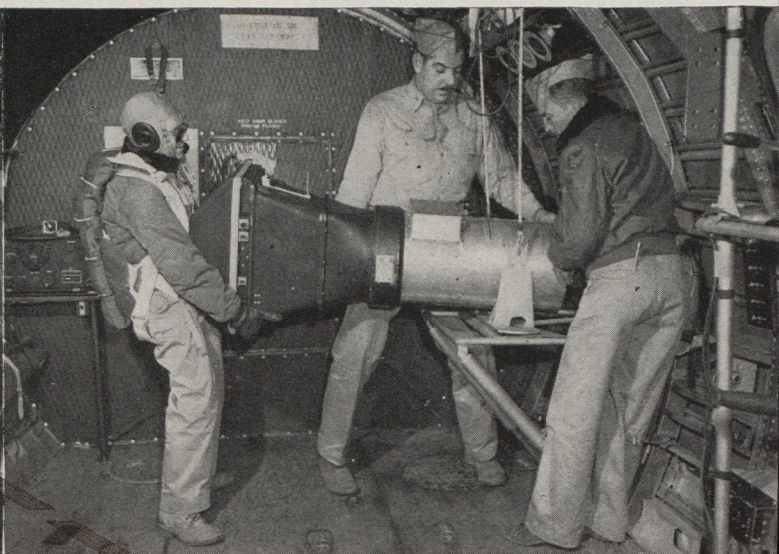
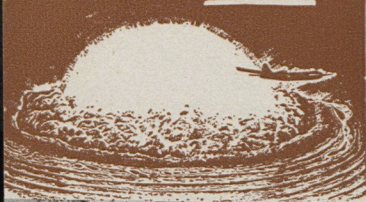
Irving Kolodin, the NEW YORK SUN's music critic and erstwhile AIR FORCE staff writer, reviews Marc Blitzstein's "Airborne Symphony" on page 36. A former sergeant in the AAF, composer Blitzstein says he secured background for "The Enemy" section of his work from articles of the same name appearing in AIR FORCE, which he read regularly in England and on the Continent. The "Symphony" is dedicated to the 8th Air Force.

## SUBSCRIPTIONS

Subscriptions to AIR FORCE are no longer accepted on a yearly basis. Individuals desiring copies may obtain them for 20 cents a copy by writing to the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.



## OPERATION *Crossroads*



**Eight photographers** in converted C-54 operate 21 cameras of seven different types in rehearsal for the atomic bomb tests.

**Big Bertha** 48-inch camera weighing 200 pounds will be operated by William Mungall (left), designer and smallest man in Unit.

# PHOTOGRAPHING the BIG BANG

By **CHARLOTTE KNIGHT**

Air Force Staff



**Col. Paul T. Cullen**, veteran pilot-photographer commanding the Air Photo Unit for Air Task Group 1.5, walks under camera-jammed nose of F-13 photo plane with Major John D. Craig, deputy OIC for motion pictures and chief of documentary motion picture section, and Lt. Col. Richard J. Cunningham, OIC, operations.

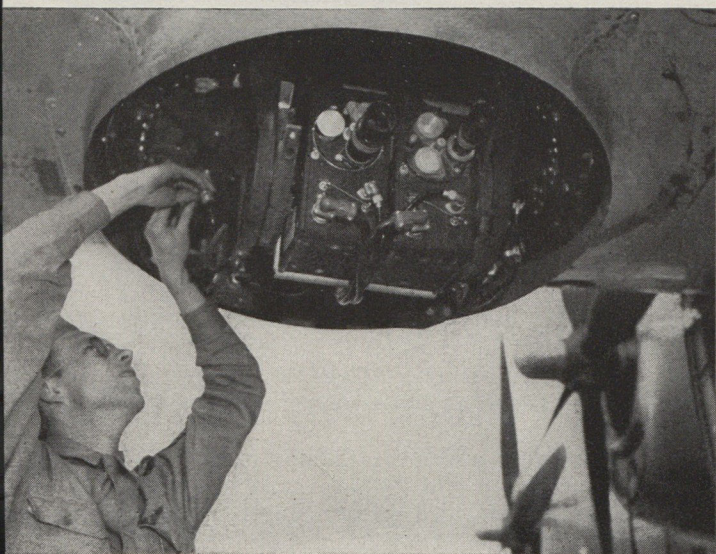
**T**he AAF is about to undertake the biggest photographic mission in its history: the assignment from Joint Army-Navy Task Force One to provide complete aerial coverage of the forthcoming atomic bomb explosion at Bikini—Operation Crossroads.

In describing just what this involves, military conservatism breaks down and one is forced to adopt the superlatives of a Hollywood publicist. They are justified, for no matter what angle you view it from, it is still the biggest job of its kind ever tackled.

First of all, Crossroads will be the most-photographed single event in history. There will be literally hundreds of cameras of every size and description, all trained on a single target: the bomb-burst. There will be giant cameras, small cameras, still and motion picture cameras, color and black-and-white, silent and sound. There will be radar cameras, television cameras, strip, smear and infra-red cameras; they will be operated both manually and electronically; they will be mounted on towers and sunk in concrete pillboxes; they will fly in airplanes and sail on shipdeck. The AAF alone expects to shoot nine-million pictures. During the first four seconds after M (time of burst) AAF motion picture cameramen will use enough film to make four full-length Hollywood feature pictures.

Second, it will be the most precisely-timed coverage ever attempted. Photo men joke among themselves: "Well, boys, the first 10-millionths of a second are the hardest!"





**Lower turret** of F-13 Superfortress photo plane holds two cameras. In addition, plane carries 26 other cameras, both still and movie.

Actually it is not too much of an exaggeration for never before, even during war-long operations calling for split-second timing, has the AAF had to meet the challenge of micro-second synchronization demanded by Crossroads. From the Manhattan District to the Air Forces came this request: "Get for us on film," said the scientists, "the first one-tenth of a second after bomb-burst. And if possible, get it so that it can be broken down for analysis to less than one ten-thousandth of a second." For good measure, the AAF has gone the Manhattan District one better: it will have its film so marked that it can be measured in terms of 500-millionths of a second.

Finally, the project's technical requirements are greater than any that photographers have ever been called upon to meet. As one of the most important tools of modern science, photography will be expected to provide the nuclear physicists, meteorologists and experts on radar and communications with accurate scientific data concerning the behavior of atomic explosion, much of which has not yet been obtained by previous A-bomb photographs. Pictures are being counted on to record for careful analysis later all manner of physical phenomena occurring with such speed and intensity they do not register on the naked eye.

In addition to evidence concerning damage to the target ships in Bikini lagoon, the photographs taken during the critical period immediately following M-zero are expected to be one of the chief sources of measuring flash characteristics of the burst, water waves, pressure waves, shock waves, degree of light intensity, color temperature, spectrographic properties and rate of growth of bomb-burst. Indeed, it is possible that a new phase of applied science is being born—that of highly technical atomic photography, a subject already dubbed "Photomics" by some of the Crossroads photo people.

Briefly, there it is. The job, with all its problems, was handed to Col.

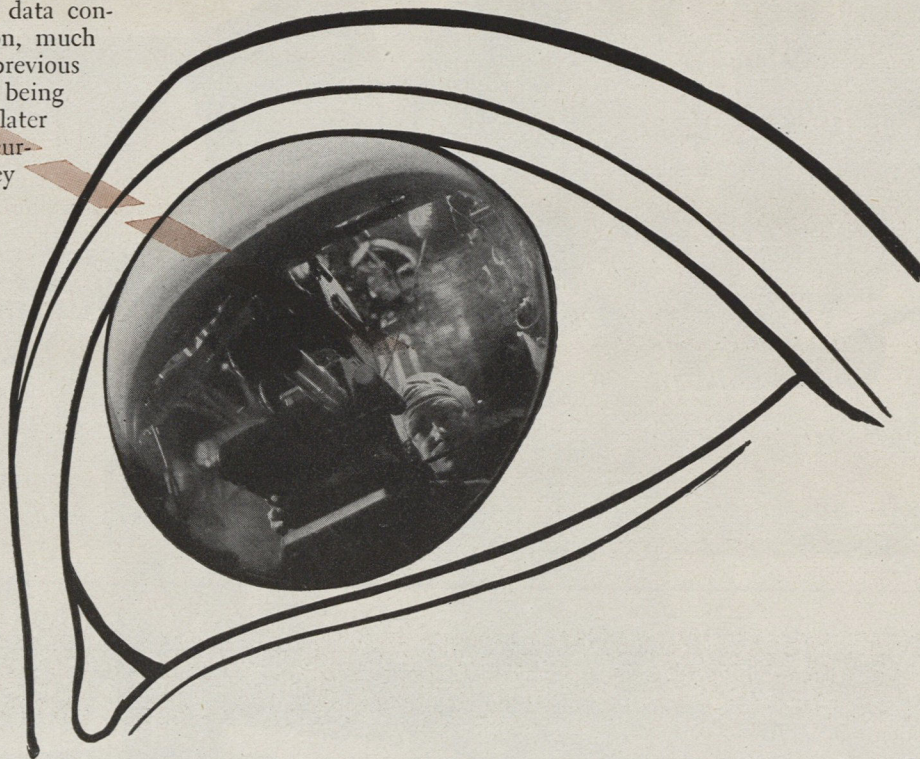
Paul T. Cullen, veteran pilot-photographer, hero of numerous aerial reconnaissance missions in Africa and the ETO, and pioneer map-survey flier over much of the Western Hemisphere from Alaska to the Andes. In establishing his Air Photo Unit for the Crossroads Air Task Group 1.5 in Roswell, N. M., Colonel Cullen was faced with two major problems: the equipment necessary to fill the technical demands of the project, and assembling the trained personnel to operate it. Meeting both of these requirements has been, according to the Colonel, "the nearest thing to a three-ring circus I've ever encountered in the Army."

Almost every known type of aerial camera was brought in to do the job. If the standard model wouldn't do all that Crossroads demanded of it, Wright Field Photographic Laboratory technicians re-built it. The original date of the bomb test, before its postponement to July 1, was set for early May and photo men raced against time itself. They pleaded with manufacturers to rush high priority equipment to them, and as many as 10 planes would be out at once scouring the country for precious film and camera parts. Film was flown to Roswell for training, still more film to Kwajalein. More than 1,750,000 feet of motion picture film alone was on its way to the Marshalls in late March.

Master photographic plans were laid out: the function, position in the plane, triggering-off and running time of each of the 300 cameras to be used in the flights. While photo-physicists worked day and night at Wright Field to build special lenses, filters and timing devices, depot workers were struggling equally long hours at Oklahoma City and Middletown, Pa., to complete necessary modifications to 10 F-13s (B-29 photo planes) and two C-54s. Installation of the cameras was no easy matter. Literally aerial camera platforms, these planes have lenses protruding through bomb bays, blisters, turrets, passenger-cabin windows—and in many cases, through specially-cut openings in the fuselage. Wiring was equally difficult.

Getting the trained cameramen and skilled technicians for the project proved even more of a problem. Demobilization had taken its heavy toll, and many photographers

*(Continued on Page 46)*





# MEDICINE



## SCHOOL OF AVIATION MEDICINE TRAINS FLIGHT SURGEONS AND

**S**tories of aviation medicine have been told in various ways. There is the saga of flight surgeons who flew their instrument satchels and test kits into combat zones. There are tales of a million air evacuations and of the technicians and flight nurses who made possible the AAF's life-saving in the sky. There are reports, many of them still fragmentary, of aeromedical progress in wartime developments of new drugs, new equipment, new preventive measures and new treatments. Many of these stories had their beginning at the AAF School of Aviation Medicine, Randolph Field. This is a quick retrospect of the training that has been carried on there and some of the promises which that training offers the AAF and the aviation world of the future.

During the war, German and Japanese air forces provided only one kind of menace faced by the Air Force. All the ailments that combat can inherit are complicated by special hazards of flying and by the flier's changing physical environment that may range from sea-level to altitudes several miles high, from sweltering heat on an air strip to sub-zero temperatures upstairs. In an airplane, nervous disorder, visual disability, or motion sickness can be as deadly as flak wounds. So can the effects

of high altitude, speed and intense cold. Flight surgeons and all who aid them therefore have to undertake medical practice "with a difference." That difference accounts for the training program at AFSAM, the School of Aviation Medicine in which examiners, flight surgeons, flight nurses, medical technicians and other specialists begin their practice in the sky.

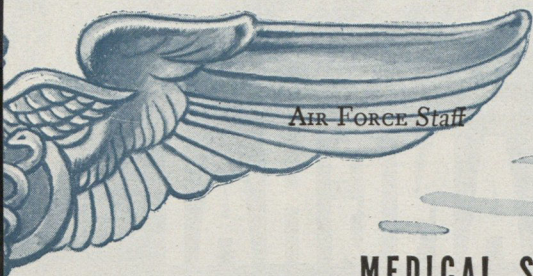
As a primary requisite, the training of able flight surgeons demands competent doctors. A sound medical background must be combined with an understanding of aviation—not merely the technique or obvious risks of flying, but all its implications for physical well-being. A flight surgeon, for example, can't rely on previous experience with a new drug on the ground. He has to know its probable effects on a patient's future missions. He must know something about neuropsychiatry; if he is going to be of value to a squadron in combat, he must know a great deal about it. However successfully he has practiced in Chicago or Vermont, he must set about studying tropical diseases, in case he is assigned to an area where those diseases may be met. This is a large order, this requirement that doctors be made into flight surgeons. That it was met successfully is due partly to the men who joined up as flying medics and partly to the system of training which the AAF developed for them.

As a matter of fact, the rosters of the School of Aviation Medicine are an impressive medical directory. They list a sizable percentage of relatively young leaders in the medical profession, now specially trained in techniques that will

**Flight nurses** practice loading a patient into a winged ambulance during air evacuation class.







# IN THE SKY

## MEDICAL SPECIALISTS TO MAINTAIN THE HEALTH OF OUR FLIERS

continue to be a vital concern of the AAF and the flying world. For pilots and air passengers the work of these specialists in aviation medicine is not just a pleasant success story. It is life insurance. There may have been a time when such specialists in civilian life could be defined mainly in terms of examination for civilian pilot's license. Today the civilian practice of aviation medicine ranges from rare disorders to relatively common complaints like aer sinusitis. Once the questions of physical comfort in flight—the suitability of diet or protection against noise, for example—might be dismissed as sissy stuff. These prosaic matters, subjects of careful study and experiment during the war, will be increasingly important in modern air transportation.

Into civilian medical practice that will assist the development of that transportation, the AAF's flying medics will carry knowledge gained through study and experience since 1941. To 5,000 flight surgeons and aviation medical examiners trained at AFSAM in the past six years, an air-minded population can look for more than exciting reminiscence about medicine at war or highly involved laboratory experiments scarcely intelligible to the layman. If that layman is going to fly, his health may depend on one of these men.

Besides the flight surgeons' program, specialized training and research have been advanced by wartime activities of the School of Aviation Medicine. Demands of combat at higher and higher altitudes emphasized the significance of the altitude training at San Antonio. More than 3,000

students were registered in courses on oxygen, personal equipment and aviation physiology. In the high altitude indoctrination course alone nearly 20,000 man-flights were made. About 2,000 flight surgeons' assistants completed courses in vision testing and electroencephalography, a relatively new science which has been described unscientifically as the means by which the brain, with the help of an electrical machine, can write the story of its own activity.

Among the wartime courses in aviation medicine, air evacuation has perhaps received most dramatic emphasis. Originally centered at Bowman Field, Ky., this department graduated 3,000 medical officers, flight nurses, and technicians. Any notion that air evacuation training is a romantic sort of sky-riding with the sick is dispelled by a glance at the typical student's schedule. On a Monday, subjects of study may include malaria, dengue fever, snow blindness and a miscellany of other ailments likely to be met by a global air force. Tuesday's routine may be more active, including a dunking in deep water while wearing full equipment followed by a workout on life-raft equipment from flares to fishing tackle. Once classroom study and ground practice are completed, students begin evacuation flights between bases in this country. Students get many things in this course, but leisure isn't one of them.

Every phase of the training program at AFSAM was designed and constantly revised, in the light of current aero-medical research. Benefiting from the experimental programs in equipment at Wright Field and the Tactical

(Continued on Page 47)

**Future flight surgeons** work out in a high-altitude chamber. They must know the ailments combat can inherit which are complicated by a constantly changing physical environment. Every relationship of medical practice to aviation must be mastered by AAF flying medics.





# UNSHACKLING SHANGHAI



**Soldiers** of the surrender army were often packed 80 men to a plane—probably the greatest troop load ever carried by a single aircraft.

**BY 1ST LT. LAWRENCE T. GORDON**  
AIR FORCE Staff

Complete with Oriental locale, the story of the transport of a Chinese Army by one of ATC's divisions reads like a script for a big-time variety show. About the only thing missing is the kidnapping of a million dollar heiress who turns out to be Kilroy's daughter. The show, put on by the India-China Division, has in it a "stolen" air field, an Alphonse-Gaston act, a gang of swoonsters, a vanquished enemy telling the victors what they can't do, a group of fliers refueling with gas they themselves carried, and a fleet of planes carrying up to 80 men in each aircraft.

All this happened in an operation known as the Cannon Project, named after Col. Andrew Cannon, Commander of ICD's Bengal or C-54 Wing. The project was initiated in September 1945, when it was necessary to carry the 94th Chinese Army and its equipment from Liuchow to Shanghai to accept the surrender of 300,000 Japanese troops. A transportation problem arose when the 94th was selected to complete the surrender because Shanghai is more than a thousand miles to the north of Liuchow. There were no trains, roads were poor, and there was no motor transportation. Lack of shipping and the fact that water approaches

to Shanghai and Canton were thoroughly mined made water transportation impossible.

Originally, it was proposed that the 94th be airlifted from Liuchow to Shanghai by groups of combat cargo C-46s, moved from Burma to China bases with masses of men and equipment. Such an operation, however, would have been costly in time and money for it would require the transport of aviation gas, parts and other supplies over the "Hump" before anything could be done about moving the troops themselves.

As an alternative, ICD offered a more satisfactory and efficient plan for this difficult mission. And in 20 days, the ICD effort operating on a fully self-supporting basis from India, moved 26,237 Chinese troops and supplies totaling 388 tons in 60 C-54s. This topped records previously compiled by ICD in moving six other complete armies for the India-Burma and China theatres.

Here's the way ICD's Cannon Project licked the problem with a fleet of 60 C-54s. These Skymasters were based at their home stations in Bengal, far to the west of Liuchow, on the plains of the Ganges Valley where maintenance was best, where huge stores of aviation gas were available and where personnel involved in the mission were supported at a minimum cost. In addition, it was not necessary to



## The Air Transport Command carried Chinese troops to Shanghai

but had to 'steal' a field to put them down

support large numbers of personnel in China. Cannon Project aircraft were given maximum tank loads of gas plus maximum cabin loads of packaged aviation gas and aviation oil. After crossing the "Hump" to Liuchow, the packaged fuel was removed and a full load of Chinese troops and equipment was substituted. Carefully briefed five-man crews carried the troops to Shanghai and then returned to Liuchow. Here they refueled, with the packaged gasoline they themselves delivered, for the return run to Bengal bases. Because of the lack of facilities at Shanghai, crews remained two nights at Liuchow, outbound and inbound. This lay-over was needed because the crews covered 4,615 miles on a round trip from Bengal.

The Cannon plan had several advantages. At a time when air support over the "Hump" was at a premium, this operation was entirely self-supporting, from India. It was unnecessary to send heavy groups of combat cargo C-46s, with thousands of personnel and thousands of tons of equipment, into China and support them there at great expense. Under the ICD's Cannon movement, a minimum number of additional personnel would be needed in China to fulfill the operation. And most important, the utilization of C-54s with their large payload would complete the movement in the shortest possible time, with the minimum number of sorties. In fact, the Skymaster was the only type of aircraft that could complete this assignment at a comparatively small cost.

Before the Cannon Project could get into full swing, however, several obstacles had to be removed. Communications, weather, staging of crews, navigation and terminal facilities presented additional problems that were solved with experience and techniques ICD developed while setting up the original "Hump" routes.

Besides the normal problems of communications and traffic control over the "Hump," there was an even more serious and unknown condition between Liuchow and Shanghai, a route which until almost the start of the movement had been entirely in the hands of the enemy. There were no navigational aids and no point-to-point communications for weather and traffic reporting. Such maps as existed were inadequate.

There was time for only one survey flight before the start of the movement, and the results were of great value in subsequent briefings. A radio plane was flown to Shanghai by ICD. The commercial station there was used to the maximum, and AACS soon contributed additional limited service. Navigators were used on all early flights and the movement was well under way before anything but daylight operations were possible. This was particularly irritating to the personnel of ICD, accustomed as they were to operate over the "Hump" on an around-the-clock basis.

Lt. Col. Richard W. Davania, Deputy Commander of the China Wing, piloted the first plane (C-47) of this movement into the Shanghai area. Colonel Davania departed Liuchow for Shanghai at 1300 on September 1, 1945. The flight to Shanghai was routine until the plane

was 400 miles out of Shanghai. At this time, Colonel Davania and his crew were flying above a solid overcast. When they estimated they were about 150 miles out, they let down through a break to hit light rain and a ceiling of 800 feet. Continuing along the route, the ceiling gradually became lower and precipitation heavier until visibility was about one mile and the ceiling about 200 feet. By this time the sun had set and darkness was shrouding the terrain. Since maps were inaccurate and there were no radio facilities, the crew decided to fly a true north heading until they hit the Yangtze River. Reaching the Yangtze, Colonel Davania followed the river toward Shanghai for about 30 minutes when he located what appeared to be an airport.

His report reads, "A quick survey of photographs indicated that an airport was located 10 miles south of the city and alongside the Yangtze River. Upon making a closer observation, we were able to see the outline of what appeared to be two hangars and two turf landing strips—made obvious by the contrasts of the area off the strips. We circled the field at an extremely low altitude with some hesitation in landing because of past experience in finding bomb craters and ditches cut across the airports taken from the Japanese. With approximately 30 minutes of fuel left,

**Equipment** was loaded into belly compartments of the Skymasters.





we decided to effect a landing regardless of the consequences. It turned out that the field was not in too bad shape and had not been damaged by bombings. We taxied up in front of the two hangars and were met by a group of Japanese officers and enlisted men."

As soon as Colonel Davania disembarked, a Japanese officer told him in broken English that he had no business on the field and would have to depart immediately. Colonel Davania demanded to see the base commanding officer and after a lengthy discussion with him, he and his crew were escorted to the area commanding officer in downtown Shanghai. The Americans were left waiting in a bus outside his office building while Jap conferences went on for two hours. Finally, Colonel Davania was called into the office and told that the Japs had decided to turn the crew over to the American Mission but that first he must sign a release. Colonel Davania signed the release which he said was "some two pages of Japanese writing of which I did not have the slightest idea of what it said or meant."

The Americans were taken next to the Park Hotel where an American civilian, Mr. Heely, introduced himself as the American Mission and got rid of the Japanese. Mr. Heely had been interned for two and a half years and had escaped from an internment camp just one week prior to the Americans' arrival. He had taken it upon himself to evict a group of Japanese civilians from a suite of rooms and set up what he called the American Mission. Heely provided rooms, hot baths and good steaks for the US personnel.

The following day Colonel Davania proceeded north of Shanghai to locate and acquire an airport for the Cannon Project. The Swiss consul had provided him with a car and a Russian driver who spoke both English and Japanese. It was difficult to locate the actual sites of the airdromes since the area had been restricted for seven years and civilians had not been permitted to enter. Finally, Stiaziang Airdrome was discovered, but the Japanese refused to let Colonel Davania pass and he was forced to come back to town as if he had given up the project entirely. Later he drove to the gate and directly through it. This time little resistance was offered.

Now, an Alphonse-Gaston Act took place. The commanding officer at Stiaziang told Colonel Davania it was impossible for the Americans to use the field for the purpose

of landing an occupation army because the peace had not been signed. He had been instructed that the only people he would allow to use the airport would be the Chinese since the peace was to be signed with them and not the Americans. He did say that a Chinese colonel, Chan-Chit, had offices on the far side of the field and Colonel Davania would have to get his permission to allow American airplanes with Chinese troops to land.

Instead of being overjoyed at the prospect of the arrival of the Chinese surrender army, Colonel Chan-Chit advised Colonel Davania that since the peace had not been signed, the airdrome belonged to the Japanese. Therefore, it was impossible to use the airport for any operational purpose. The American colonel finally got the Jap commanding officer and the Chinese colonel together and received permission to use the airfield.

Although the war was over, the Japanese still managed to harass the victors. The first two airplanes into Shanghai carried part of the cadre that was set up to conduct the operation. One C-47 was placed in a corner of the field and with the use of a putt-putt, air-ground communications were established on VHF. Communications with Headquarters were very poor and great difficulty was encountered in transmitting and receiving messages. The Americans discovered a Japanese standard broadcast station located in downtown Shanghai and directed it to remain on the air 24 hours a day. The true bearing from this station to the field was sent to Headquarters in order that they could establish let down procedures. While this information was being published and distributed, the C-47 improvised radio tower was used to give instructions to pilots as they came into the area. This arrangement worked well for the first two or three days. Then the Japanese found they could turn off their radio without the Americans knowing about it. First reports were received when pilots became lost while within range of receiving sets on the airfield. The Jap station was monitored and when it was discovered that it had been turned off, Americans forced the Japs to put the radio station back on the air.

About this time, the American personnel discovered that swoonsters are not restricted to the United States. The residents of Shanghai literally tore the shirts off the backs of

*(Continued on Page 48)*

**Troops** of the 94th Army pile into one of ICD's C-54s. Planes carried gas to China from India, then picked up the surrender army.





# AIR SCOUTS

*AAF gives BSA a helping hand in their newly organized Air Scout program*

If your little brother starts talking about pulling so many inches of mercury, figuring his true air speed, drift and a lot of other technicalities, do not be surprised. He may be an Air Scout!

Yes, the Boy Scouts of America have initiated an Air Scout program as part of their training for youths 15 years or older. And it is under the aegis of Headquarters, AAF, through the AAF Training Command.

For years, long before the war, American lads have yearned to be fledglings and many a one during the war stumped his elders on aircraft identification. Now as he enters the last phase of scouting, he finds only the limitless air a boundary to his quest for adventure and knowledge.

Fully appreciative of the potentialities of the Air Scout program, the AAF has detailed an Air Scout liaison officer to each of the 12 Boy Scout regions in the United States. Liaison officers, selected from a large number who volunteered, were oriented as to the general policies of the Boy Scouts of America and on Air Scouting. Moreover, the program is valued so highly that summer scout encampments will be held at selected Air Forces bases.

AAF liaison officers will lend their counsel and assistance in all projects initiated by the Air Scout leaders. Such aid may touch on many phases of aviation. In particular, the liaison officers will:

- Aid in securing the latest AAF training film applicable to the Air Scout program.
- Advise Scout leaders of AAF training techniques.
- Provide such training literature of the AAF as may be helpful to Air Scouts.
- Obtain such obsolete and otherwise surplus aviation equipment as may be made available to the Air Scout program for use by the local councils.
- Utilize local aviation facilities, such as airfields, factories and other installations as training aids for Scouts.

In no particular is the interest of the Air Forces in the Scout program to be regarded as a recruiting effort. It is not in any sense to be so construed. Rather, the Air Forces are interested in providing the men of tomorrow with a basic knowledge of aviation so that they will be able to form intelligently opinions of their future in an air age.

Adult scout leaders will initiate and carry out all projects, and they will have the guidance, aid and support of the AAF through the liaison officers in carrying their plans to a successful conclusion. Interest and enthusiasm of youngsters for years have been centered on aviation, and the Air Scout program is designed to direct the energy and interest of the youths into proper channels.

Several encampments have been held already, and with marked success. Typical was the one held in September 1945 at Stewart Field, N. Y. A total of 312 youngsters together with their 32 Air Scout leaders were enrolled. They were agog with excitement as they were assigned to barracks in the cadet area and as they trooped into a wing of the consolidated mess. And like cadets they lived and went through an abbreviated course of training similar to that followed by basic flying trainees.

Scouts were divided into squadrons. Each unit had an

adult squadron leader who served as tactical officer or advisor. The Air Scouts elected one of their own members as squadron pilot and upon him rested the responsibility of directing all activities of the squadron. This envied post was rotated every two days with a result that 40 fledglings benefited by the experience.

But that was not all. In addition to getting a look-in on the actual training program at Stewart Field the Air Scouts were put through an eight-hour training period daily, taking capsule courses in 20 subjects. A few were comparatively easy, such as drilling, but there were technical ones, too, like those dealing with navigation, code, bombing theory, parachute folding and care, production line maintenance, Link trainer procedure, operations, weather, chemical warfare defense, aircraft recognition, instruments, radio voice procedure, personal equipment, radio and the use of "ditching" equipment.

One important feature was the incorporation of certain Air Scout advancement requirements into the regular presentation of such subjects as navigation, code, weather, voice procedure and aircraft recognition.

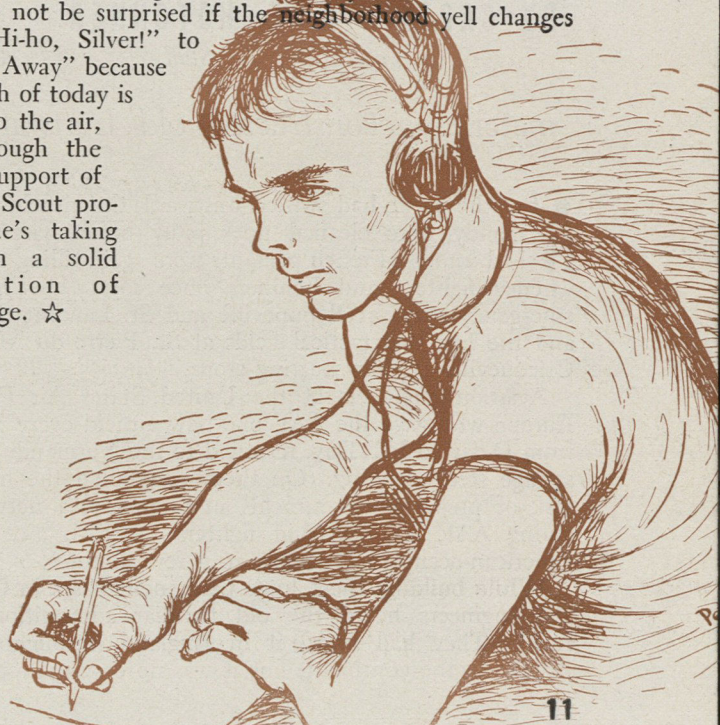
There were thrills aplenty for the boys in ground school, but nothing comparable to the one they got when they flew with an experienced pilot in an AT-6 trainer. That was the high point of a very exciting summer encampment.

Pilots gave each passenger a briefing on safety in aircraft and helped the eager youngsters adjust the parachute harness and head gear. Then they got settled, started the engine, taxied out and took off on a 35-minute flight. For many Scouts it was their first trip aloft, and they loved every minute of it.

The lads were tremendously impressed by a tour of the United States Military Academy. They observed its manifold facilities, saw its famous landmarks and watched a unique spectacle in America's military life—a parade of the Cadets in full dress uniforms. To cap the climax they watched the undefeated Army football team work out and talked with its coach, Col. Earl Blaik.

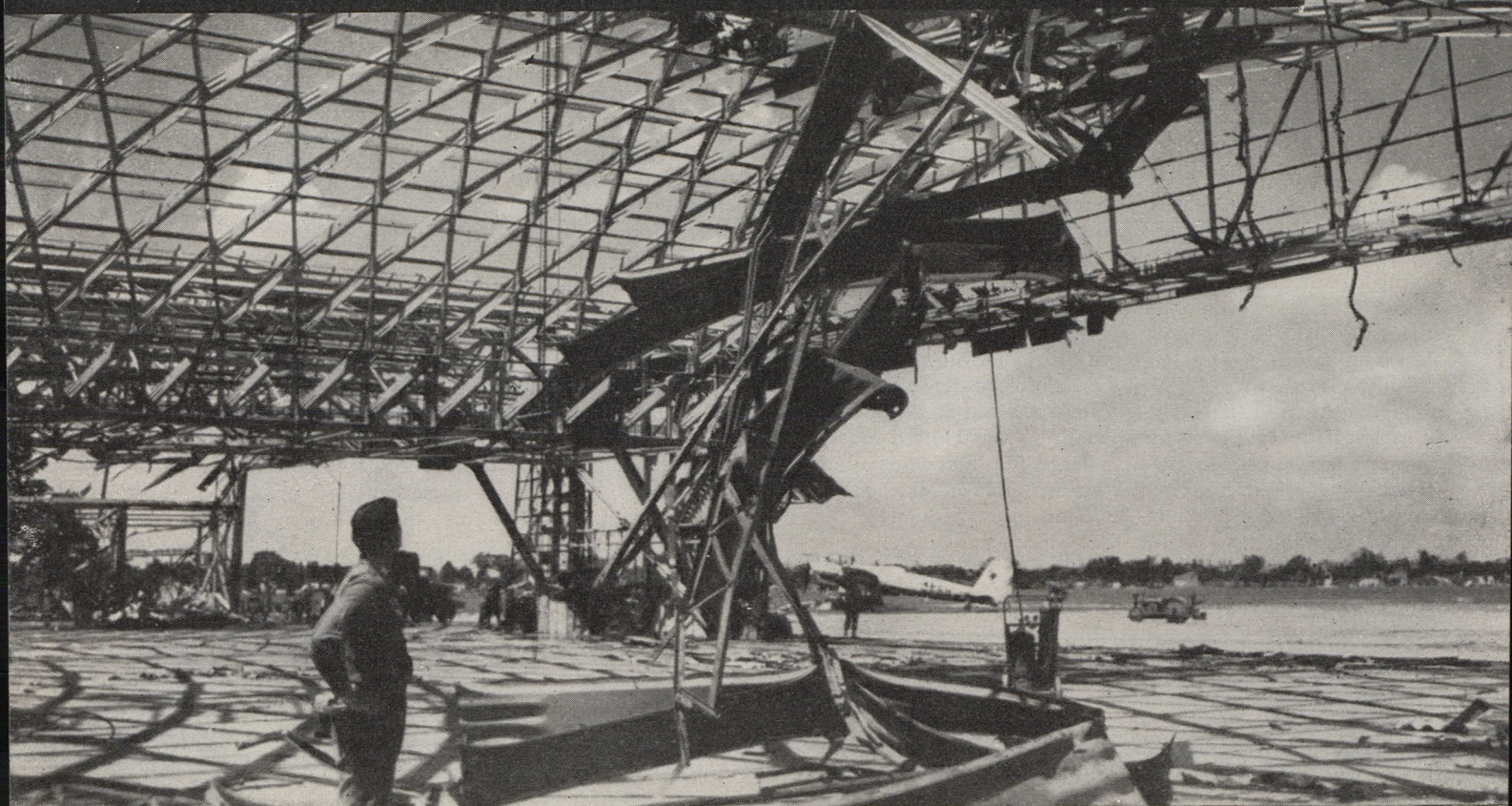
While not all Air Scout units may be able to participate in summer encampments this year because of the distance from their homes, it is probable that at least one encampment will be held in each district in the future. There will be other events arranged to sustain a year-around interest.

So do not be surprised if the neighborhood yell changes from "Hi-ho, Silver!" to "Bombs Away" because the youth of today is taking to the air, and through the AAF's support of the Air Scout program, he's taking off with a solid foundation of knowledge. ☆





# Airfields, Germany



**BY CAPTAIN A. E. HOTCHNER**

*AIR FORCE Overseas Staff*

*To provide operating bases in Germany for USAFE aircraft, aviation engineers, using German labor and*

*materiel, reconstructed old Luftwaffe bases and built new airfields in record time.*

**A**fter the battle had swirled westward, the airfields in Normandy were cleaned up rapidly before last summer had waned. French peasants were again tilling the fields whence fighters and bombers once rose. The first two emergency strips at Pouppeville and St. Laurent Sur Mer, and the first two tactical fields at St. Pierre du Mont and Cricqueville are now bearing crops.

Aviation engineers of the United States Air Forces in Europe who gave the AAF one new airfield every 36 hours from D-day to V-E-Day, returned to the Normandy fields to salvage steel planking. On them had fallen the herculean task of preparing 55 airfields in Germany, a network enabling AAF bombers and fighters to reach any part of American-occupied Germany in a few minutes.

While building these huge permanent bases in Germany the engineers heard the old familiar admonition—rush! rush! They had heard it in England, throughout campaigns on the continent, but it was no easy matter to rush

the construction of fields that needed hangars, barracks, storage facilities and all-weather taxiways and runways requiring deep foundations of crushed rock to handle heavy aircraft traffic in any weather all year. Yet, like clockwork, one field appeared every four and a half days, once USAFE's aviation engineers got rolling. Aircraft used temporarily built strips during the construction period.

The 33 fields turned out by the 9th Engineer Command required 70 million man-hours, involved more than 20,000 aviation engineers, and use of 12,000 Wehrmacht PWs. All this went into repairing over 100 badly damaged hangars, filling 1,500 craters, building runways, taxiways and access roads equivalent to a 500-mile, two-lane highway from Cleveland to St. Louis. Based on these tactical fields are five heavy bomber groups, three groups of mediums and ten fighter-bomber outfits. All together these groups control more than 1,500 combat aircraft, exclusive of photo recons, transport and cargo planes.





**German prisoners of war** were utilized by aviation engineers to repair and construct hangars, runways, taxi strips and access roads for 33 American airfields in the Reich. Eight bomber and ten fighter groups totaling more than 1,500 planes are based on these fields.

Ingenious American use of captured equipment, material and men was the key to the success of this remarkable construction program. At a Luftwaffe field near Schweinfurt, the withdrawing Nazis mined all key places with 250 kg demolition bombs—the airdrome's water supply system, pump stations, utilities adequate for servicing a city of 10,000 in addition to all the runways. Only the superintendent of the field was left and entrusted with the job of pushing a button in his office to detonate the whole thing. But as the Americans approached, the Luftwaffe hireling not only did not push the button, but he showed the AAF exploit teams where the demolition charges were.

After thinking the situation over he decided that if he had blown up the airdrome he would be out of a job; if he didn't, the Americans might let him keep his job. He was right. As a PW he remained, and the 9th Engineer Command refitted the field for AAF use.

Not all German fields were taken intact; most of them required extensive repairs to installations wrecked by the Nazis and by our own bombings. However, it was a great time saver to repair this damage rather than to construct new fields. It was not a matter of starting too late, for the airbase program had been planned in October 1944, and by February, 1945 most of the sites had been selected from

the hundreds surveyed by aerial reconnaissance teams. Work on several fields had already been started by V-E Day.

On paper the job looked simple enough by using normal operating procedures, but then 'snafus' began to roll into Headquarters. In the first place, hundreds of thousands of bags of cement were needed and there weren't enough on hand to fill a good-sized cavity. Concrete mixing machinery was scarce. German runways were found inadequate for our heavies and transports, and lastly, the number of man-hours in the face of these unexpected difficulties had been underestimated.

The man-hour snafu was solved by using PWs. The 9th Engineer Command, for example, employed 12,000 obtained from a huge pool of German personnel that contained experienced Luftwaffe and SS men and many of Germany's better-known Autobahn builders. Col. Karl B. Schilling, CO of the 9th, instituted the two-shifts-a-day system and the labor snafu was licked.

At Oberpfaffenhofen, south of Munich, the same German contractor who paved the Berlin-Munich Autobahn was put to work paving the often-bombed Dornier experimental field, rebuilt for an AAF heavy bomber base by the 862nd Engineer Aviation Battalion.

(Continued on Page 48)



# CRASH RESCUE



Cutting a path to the blazing plane with water fog, crash rescue "V" must combine speed, care and technical knowledge.



**Realistic dummy** is lifted out of plane as linemen control fire in a practice rescue.

**Flames under control**, rescue team spreads out to put finishing touches on the fire.



**D**uring the war more men were killed in ground crashes than in aerial combat. This blunt fact accounts for Air Force emphasis on the techniques of aircraft crash rescue—an emphasis which, according to evaluations by CAA, has given the United States world leadership in the development of fire fighting and rescue equipment.\*

New developments in the past year have been based on the realization that technical problems involved in rescuing personnel from a burning plane, and effective prevention of fire in a crashed plane, are more closely related to maintenance than to structural fire fighting. Therefore, rescue teams, consisting of eight specially trained men under the supervision of a crash chief, function as a part of Aircraft Maintenance on each base. AAF crash crew training is conducted at Buckley Field, Col.

Further help to the crash rescue program has come through Army-Navy development of basic concepts and a uniform rescue plan, which means that rescue personnel now have an SOP on which to build.

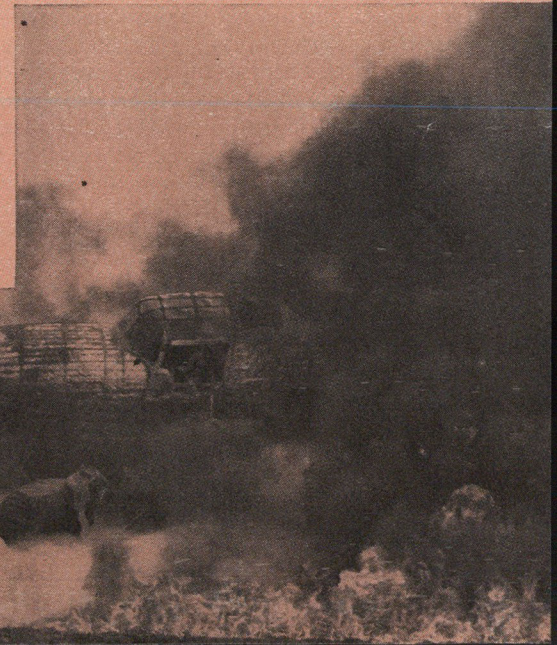
The AAF's rescue plan, including training, technique and development, has been under the guidance of Lt. Col. Harry H. Watson, Headquarters, AAF.

\* For details on fire fighting equipment and techniques see page 50 of Air Force, September 1944.



**Not a blizzard** but Foamite, used here to save a burning 8th AF B-17 fired by flak.

**First objective** of rescue team is to reach cockpit and save men trapped by the flames.





# GLOBAL WEATHER

*Long Range Superfortresses Will Carry AAF Observers to the Spawning Grounds of Arctic Blizzards and Tropical Hurricanes.*

BY 1st LT. HARMON H. HARPER     AIR FORCE Staff

**S**uperfortresses, converted into flying weather observatories, soon will be sampling the elements from the North Pole to the hurricane areas of the Caribbean, from Iceland to Japan. Highly trained weather specialists will make meteorological observations and collect data that will enable a forecaster to predict future weather conditions more accurately.

These planes, to be put into operation by the recently reorganized Air Weather Service, are the latest means of collecting scientific data from the atmosphere. Functioning under the Air Transport Command, Air Weather Service plans to operate four Very Long Range Weather Reconnaissance Squadrons in the near future. This program probably will be augmented by two other VLR squadrons when planes and crews become available. The 59th VLR Weather Reconnaissance Squadron, now training with B-29s, will chart the weather in the North Pacific, and data gathered by this squadron will be used to set the exact day for the atom bomb test at Bikini atoll.

Gathering weather data by specially modified aircraft and specially trained crews is a relatively new procedure. Its first use by US agencies dates from July, 1943 when Weather Reconnaissance Squadron Test Number 1 began flights over the North Atlantic ferry routes. Earlier in the war, however, the British and Germans used this method to obtain weather data in the Atlantic and North Sea. Normally, weather data is collected by ground stations and ships at sea. When war came, weather information became vital to military operations. However, reports from ships ceased because radio silence had to be maintained as a precaution against submarines. In addition, many ground stations in outlying areas halted transmission of reports because of their exposed positions.

As our military operations expanded and new territory was occupied, additional ground stations were established, but this was a long and arduous task. In many areas where weather coverage was needed, the establishment of ground stations was impossible. The solution of these difficulties is as important to the present and future peacetime economy as it was to the AAF in time of war.

In order to make longer range forecasts of weather conditions, data must be collected from areas where weather is born. Much of the weather that affects our military operations and continental life originates in the Arctic regions and moves generally in a southeasterly direction, affecting atmospheric conditions in the British Isles, continental Europe, the United States and the North Pacific. Hurricanes and typhoons have their origin in the tropics and move in a northerly direction. These storms affect the southern US, the Philippines and Japanese regions. Information taken from both the Arctic region and the tropics where ground reports are scarce enables a forecaster to predict weather conditions in the affected areas 24 to 36 hours before they prevail.

Other sources of the elements are over North China, Siberia and the Gobi Desert where Pacific weather is born and moves south by east. The fronts moving from these areas affect the Japanese home islands, the China Sea, the Philippines and other South Pacific regions. The terrain and prevailing weather conditions in many areas render the establishment of ground stations a major undertaking, if

at all possible. Icebound regions in the Arctic even forbid the use of ships for taking observations. Planes, however, can make daily flights over these isolated districts.

Weather conditions and the foreknowledge of them are of the utmost importance for military operations. This information might well be the deciding factor in the success or failure of an attack. High seas caused by a storm thousands of miles away may prevent the debarkation of troops and supplies. As a case in point, landing operations in the Marianas were seriously hampered when the after effects of a storm in the Philippines were felt days later.

By taking data from the weather as it moved over Manchuria and their home islands, the Japanese were able to forecast conditions that would prevail in the South Pacific several days in advance. Many of their most ambitious operations were planned on the basis of this knowledge. The Japanese fleet sailed against Midway Island under cover of a weather front moving in that direction. Later in the war they sent an invasion fleet against Australia and New Guinea under the obscurity of an advancing weather front. D-Day at Normandy was determined on the basis of a forecast made from information collected by British and American planes flying over the North Atlantic.

In aerial warfare, advance knowledge of weather conditions is doubly important. Wind velocity is likely to determine the range of planes and the accuracy of bombing. Temperatures at various altitudes may cause hazardous icing conditions. The condensation of exhaust fumes become vapor trails that point white fingers at the attacking force. Cloud heights and types may determine whether the target will be obscured and whether it is to be bombed by radar or sight.

Early weather reconnaissance programs were handicapped in obtaining refined scientific data by operational hazards, lack of trained personnel and inadequate instruments. Intensive research during the war, however, has greatly developed refined equipment that can be used for taking weather data in planes. The new Superfortress will carry the latest devices for recording temperature, wind velocity, humidity, barometric pressure and cloud heights.

The present plans of Air Weather Service call for 12 planes per squadron, organized into three flights of four planes each. Each plane will have a crew of eight consisting of pilot, co-pilot, flight engineer, radar operator, navigator, two radio operators and a weather officer who is a specially trained meteorologist, capable of making scientific weather observations. (See AIR FORCE, Mar.-Apr. 1946.) The crews will fly approximately 90 hours a month. The B-29s will be stripped of all armor and armament and will carry releasable fuel cells in the bomb bays for maximum range. Flights have been based on 3,000 mile hops, and the bombardier's compartment has been converted into a flying weather office for the meteorologist. Routes for the weather planes will be organized into a pattern of zig-zag legs covering important weather areas of the world not covered by shipping



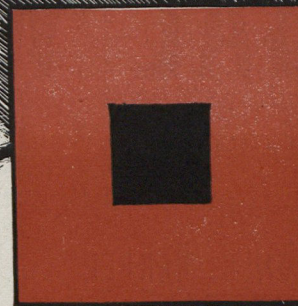
lanes, fixed weather ships or land stations. Daily flights along these routes will provide up-to-the-minute information on all atmospheric conditions, with observations recorded every half hour or 100 miles.

In addition to all proven instruments used in collecting weather data, the planes will carry the standard radar set AN/APQ-13 and the AN/APA-36 Indicator. This set will search the sky in a 100-mile radius, and scope imagery will show any large clouds or storm fronts in the areas scanned. Radar will increase the potential area of observation and provide front detection on night reconnaissance flights and operations flown in instrument conditions. Also, with newly-developed methods a "double drift" can be taken by using radar. Thus, observers can determine wind velocities at night or when atmospheric conditions prevent calculations by the standard method. The specially equipped B-29 also will carry the SCR-718C radio altimeter to be used with the standard altimeter for calculating pressures, the ML-313 psychrometer for taking wet and dry bulb readings of humidity, barometers for pressure data, cloud height meters for measuring cloud masses and an aerograph recorder.

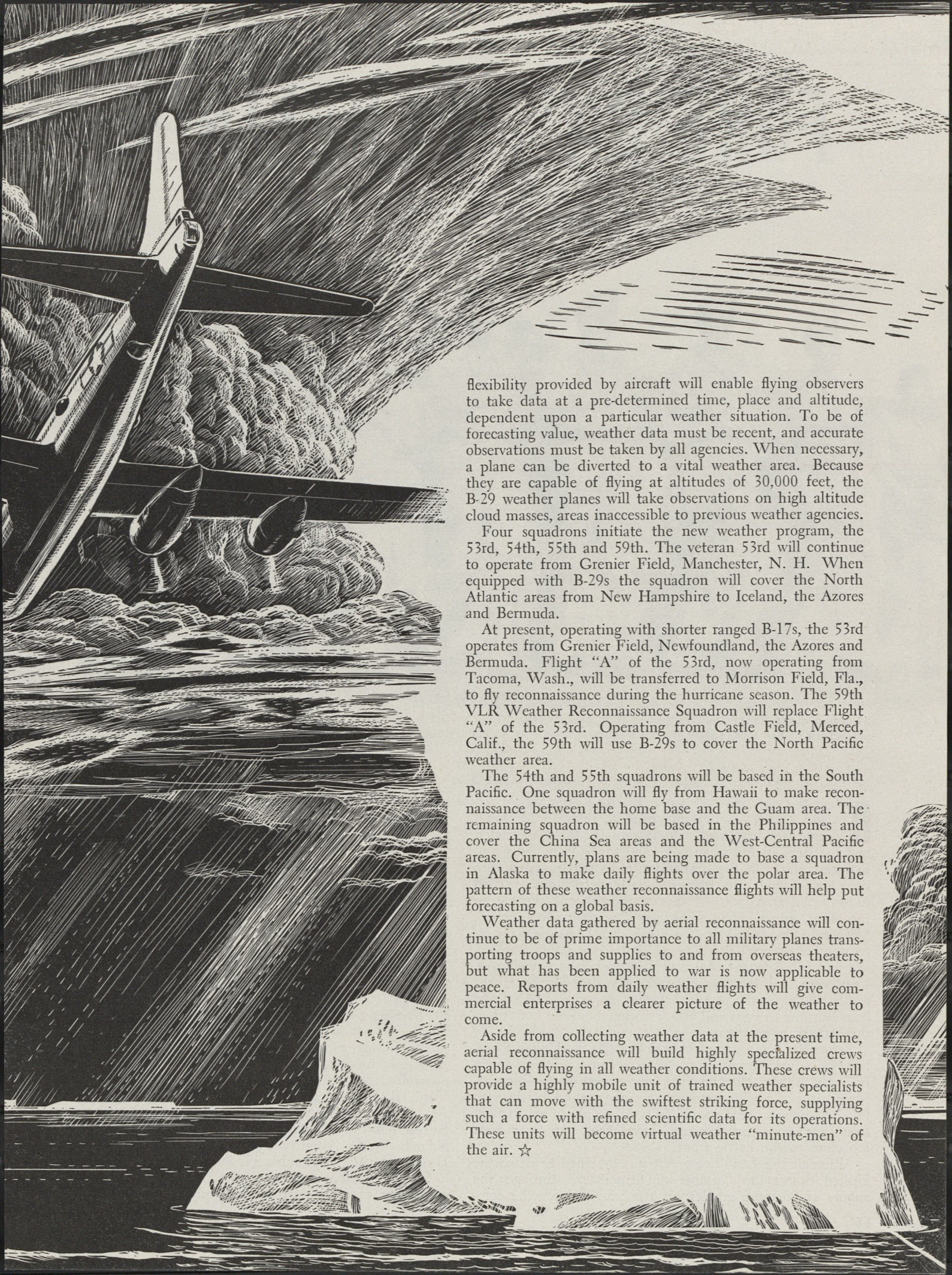
Drop-sondes will be used to collect data from the atmosphere below the plane. These instruments, modified from those employed by ground stations, will be released by parachute every 250 miles. As they descend they will transmit data, by radio, on temperature, humidity and barometric pressure. This information will be received by the flying radio operators and retransmitted to ground stations. Periodically, all data collected by the planes will be radioed to a ground station which will transmit it to a weather central. The data received will be used by the weather central in preparation of its world synoptic weather chart every six hours. This chart will show global weather conditions. The data will be fed into the weather bureau network for dissemination and use by all civil and military agencies. At the end of each flight the weather officer will prepare a post flight summary of all data, providing a basis for future predictions and operating procedures.

In effect, daily weather flights will establish weather stations over the sea areas. Likewise, important weather areas, now untended since 740 of the 900 established ground stations have been closed, will be covered by these flying observatories. Thus, by collecting scientific information from areas beyond the range of existing ground stations, weather reconnaissance will supply vital supplementary data and increased scope of weather coverage.

Weather data collected by planes generally may be more valuable than that taken by ships at sea. The mobility and







flexibility provided by aircraft will enable flying observers to take data at a pre-determined time, place and altitude, dependent upon a particular weather situation. To be of forecasting value, weather data must be recent, and accurate observations must be taken by all agencies. When necessary, a plane can be diverted to a vital weather area. Because they are capable of flying at altitudes of 30,000 feet, the B-29 weather planes will take observations on high altitude cloud masses, areas inaccessible to previous weather agencies.

Four squadrons initiate the new weather program, the 53rd, 54th, 55th and 59th. The veteran 53rd will continue to operate from Grenier Field, Manchester, N. H. When equipped with B-29s the squadron will cover the North Atlantic areas from New Hampshire to Iceland, the Azores and Bermuda.

At present, operating with shorter ranged B-17s, the 53rd operates from Grenier Field, Newfoundland, the Azores and Bermuda. Flight "A" of the 53rd, now operating from Tacoma, Wash., will be transferred to Morrison Field, Fla., to fly reconnaissance during the hurricane season. The 59th VLR Weather Reconnaissance Squadron will replace Flight "A" of the 53rd. Operating from Castle Field, Merced, Calif., the 59th will use B-29s to cover the North Pacific weather area.

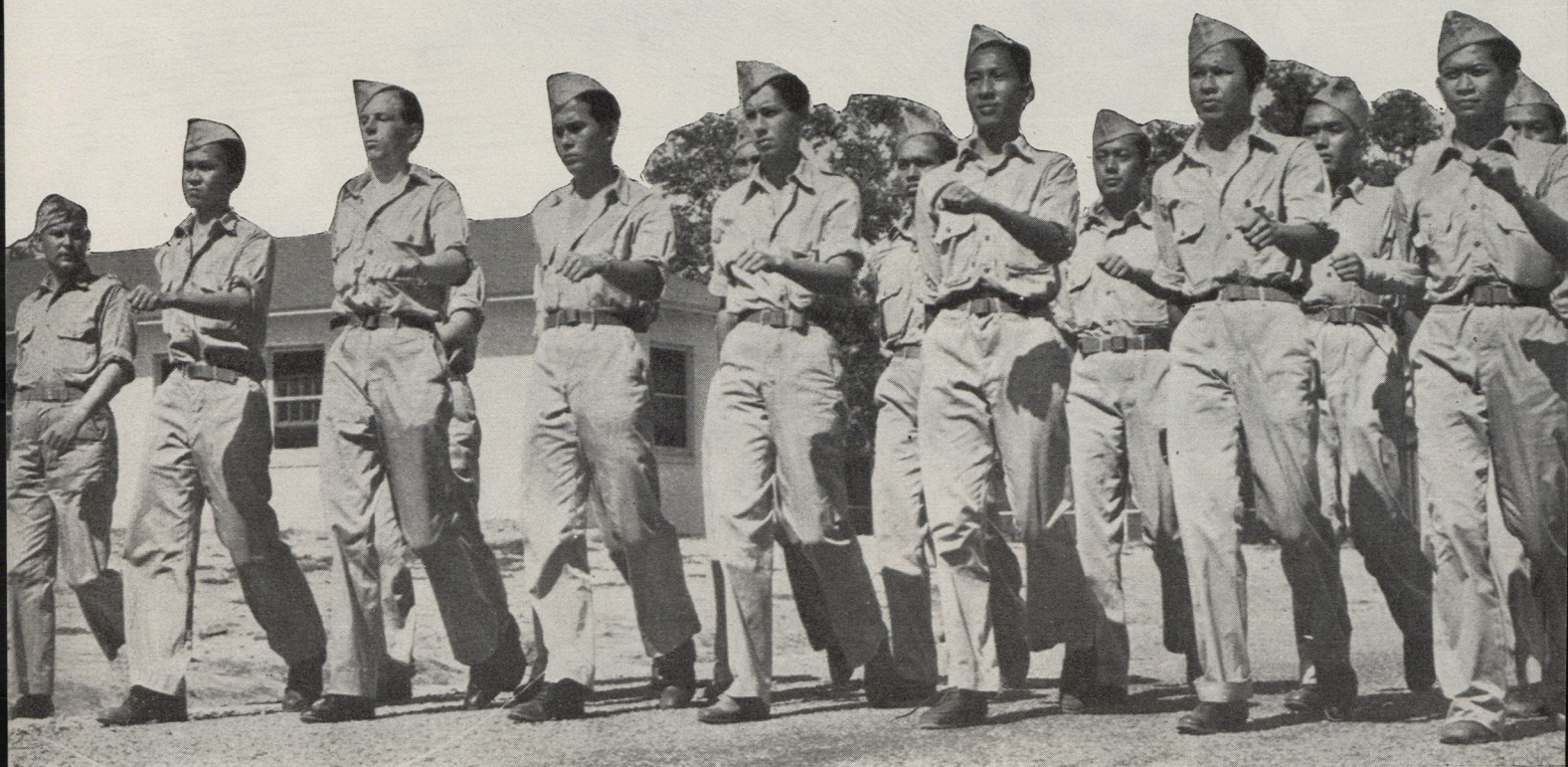
The 54th and 55th squadrons will be based in the South Pacific. One squadron will fly from Hawaii to make reconnaissance between the home base and the Guam area. The remaining squadron will be based in the Philippines and cover the China Sea areas and the West-Central Pacific areas. Currently, plans are being made to base a squadron in Alaska to make daily flights over the polar area. The pattern of these weather reconnaissance flights will help put forecasting on a global basis.

Weather data gathered by aerial reconnaissance will continue to be of prime importance to all military planes transporting troops and supplies to and from overseas theaters, but what has been applied to war is now applicable to peace. Reports from daily weather flights will give commercial enterprises a clearer picture of the weather to come.

Aside from collecting weather data at the present time, aerial reconnaissance will build highly specialized crews capable of flying in all weather conditions. These crews will provide a highly mobile unit of trained weather specialists that can move with the swiftest striking force, supplying such a force with refined scientific data for its operations. These units will become virtual weather "minute-men" of the air. ☆



# FOREIGN FLEDGLINGS



**Swinging along** in the military drill of their country, these Dutch East Indies soldiers belong to the Royal Netherlands Military Flying School. They took a rigid five-week gunnery course at Tyndall Field, Fla. The clenched fist is typical of their marching style.

**D**uring the days of 1941 when Britain's skies were filled with German bombers and English, French and Dutch people strained their eyes skyward for the Nazi raider, many citizens in American cities and towns were casting an inquiring glance at the strange uniforms that mingled with their own khaki clad trainees. Bartenders raised puzzled brows when asked for, "A spot of warm beer." People on the streets gaped when some grey clad youngster queried, "Where is the tram" or "I say old chap." Amazement increased further with the meeting of the ever polite Chinese, the colorful Russian soldier or the wiry Free Frenchman. Few knew that these young men were here to be taught combat flying in the peaceful skies of America—AAF fledglings learning to fight and also learning about our country as they taught us of theirs.

Before the beginning of World War II, the United States had occasionally trained representatives of foreign air forces but war made the demand and need much greater. Many countries who were actively engaged in battle with the Axis powers were unable to train air personnel in their own countries either because they lacked planes or were too close to the battle front.

Although the Lend-Lease Act was designed to make the United States the "arsenal of democracy" through the supply of "defense articles" it also provided for the com-

munication of any information necessary for the use of that materiel. In reality the foreign fledglings that came for AAF training were "lend-lease."

The largest group of foreign citizens trained in the United States were British. At the outset, General Arnold offered Great Britain 260 primary and 285 basic trainers. The operators of the six civilian flying schools under contract to the Air Corps each established a new school for the training of British pilots exclusively. Another school was added later, making a total of seven.

General Arnold announced in June 1941 that due to the shortage of operational aircraft in the United States, the AAF could not use effectively the potential output of its training plant. Because of this situation, the United States was willing to divert temporarily one-third of its pilot training program in order to further assist Great Britain in meeting its critical pilot needs. Under this arrangement, known as the "Arnold Plan" or the "4,000 Pilot Plan," RAF Personnel were trained in the same schools as Americans and subject to the same systems. In all, 6,921 British pilots were graduated from British Flying Training Schools in this country by the termination date of the Lend-Lease Act, September 11, 1945.

Chinese student training in the US has had the greatest continuity of all foreign training programs. The original



## Supplying 'know-how' to go with Lend-Lease planes and equipment was little known job of the Army Air Forces.

schedule, which called for the training of 500 pilots, was increased so that by the latter part of 1944 the AAF was directed to train more than 1,700 pilots, crew members and technicians.

Chinese students were handicapped because of language differences. They had to learn English or enlist the aid of interpreters. In addition, the Chinese faced a serious obstacle in transition and operational training because of their size. Some of the students were so small they were physically unable to operate aircraft such as the P-40 and B-25. Student C. Y. Lee had to be eliminated at Luke Field because he could not manipulate the P-40 controls, even though he had four cushions behind him and one underneath. Later he was checked out on a P-39.

In 1942 a program was developed for the training of Dutch personnel from the Netherlands East Indies. The Dutch needed facilities to carry on flight training for personnel who had escaped from their invaded colonial empire. This rather colorful colony, consisting of officers, non-commissioned officers, women, children, soldiers, marines and instructors, arrived in the United States May 4, 1942. The Dutch set up their school at Jackson Army Air Base, Miss., where training was first given for B-25s and later P-40s.

Other types of training were conducted in conformity with the standard AAF pattern at various bases. Between May 1942 and February 1944, 233 pilots were graduated from advanced flying schools and 178 from operational training. More than 500 others completed training as aircrew specialists.

The invasion of North Africa in 1942 brought us into contact with numerous Free French flyers who were eager to continue the fight against the Axis. There were 1,400 French pilots ready for transition training but due to the size of our war program only a small number were able to begin immediately. However, no class smaller than 100 students was ever admitted.

Technical training of French nationals was added so as to provide for 200 French students in airplane and engine mechanic courses. Each flexible gunnery graduate was required to become a specialist in one of three technical courses: armorer, aircraft mechanic, or radio operator.

Before the days of Lend-Lease, legislation helped foster

a training program to increase American security by the elimination of Axis influence in Latin America. There was also, at one time, the possibility of a Pan-American air force to promote and preserve the future peace of the hemisphere.

The Latin American training program presents an interesting and unique side-light in the history of the AAF. The Co-ordinator of Inter-American Affairs stated, "Prior to the outbreak of the war, approximately 27,000 miles of airline transportation in South America were under the control of Axis nations utilizing their own personnel." This was of vital importance to our national security because many of the airlines operated close to the Panama Canal. The training program, which received the support of the State Department, CAB, CAA and other agencies, involved the training of Latin American civilians to replace Axis civilians in airline operations. Our entry into the war cut this program short.

The Brazilian program was the largest of the Latin American countries. It was designed to vitalize a strong air force friendly to the United States and served as a token of gratitude to Brazil for permitting the AAF to use its airfields for the South Atlantic ferry route, at a time when the Nazis were threatening to overrun North Africa. Because of language requirements the training quota was seldom filled. However, many completed the course and one fighter squadron, given P-47 operational training in 1944, saw service at Pisa, Italy. Programs allowed most other Latin American countries were small, mainly because most of them were not active combatants. From May 1941, to September 1945, only seven of these countries had more than ten graduates.

Other nations came for training, although in lesser numbers. AAF-trained Yugoslavians saw service with the 12th and 15th Air Forces; the 201st Mexican Fighter Squadron was trained in the United States and fought in the Pacific; Russians were trained at Fort George Wright, Washington and flew B-25s to their country; and a Norwegian medical officer entered the School of Aviation Medicine at Randolph Field.

The AAF, by training foreign nationals to use US equipment against common foes, strengthened the bonds of international friendship and understanding. ☆

**Capt. Dr. Clobis Cardoso de Moraes**, surgeon for the Brazilian Air Force, examines a high pressure chamber at USAAB, Orlando.

**Shooting the sun**, these Dutch navigator trainees were part of a colorful colony of Netherlands personnel trained in United States.





# The AAF Tells Its Story

*From 170,000 historical reports written in the heat of battle the AAF Historical Office is compiling, as basis for official AAF histories, one of the most significant libraries of military action ever assembled.*

**D**uring the war, many a corporal, captain, or other member of the AAF sifted mountains of documents and wrote countless pages, reporting first-hand the history of the air war. Under continuous instruction from the Historical Office in Washington, professional historians directed this work both in the Zone of the Interior and in all theaters overseas. Organizational histories and supporting documents prepared in the field wherever the AAF was stationed now compose one of the most significant libraries of source material in military history ever assembled.

Key personnel of this world-wide agency have gathered in Washington and Baltimore to refine and interpret the war story of the AAF. Under the direction of Colonel Wilfred J. Paul, Chief, and Colonel Clanton W. Williams, AAF historian, the central office is operating at top speed to bring its main task to completion. Already lower-echelon histories are on the shelves of the AAF archives, and by mid-summer all Air Force organizational histories will be finished. In addition, the Washington staff and certain field sections have been preparing studies of strategy, tactics, training, and policy that cut across organizational bounds. By September, 100 of these AAF Historical Studies will have been written.

It is likely that more than one sergeant who labored over accounts of his group in Northwest Africa and more than one lieutenant who sweated through the collection of a thousand orders to back up monthly installments on the history of his squadron in the Pacific often wondered, "What for?" Although it will be some years before the official history of the AAF is published, reasons enough for the historical program are already apparent. Uses of the archives built up by AAF historical sections all over the world are numerous. Congressional committees have been provided with material for background study. Relatives of fliers lost in action have been given details of their last missions. Instructors preparing courses for the new AAF University have found in the historical files the most authentic teaching materials obtainable. Valuable data have been shared with such official research projects as the Strategic Bomb Survey. Practically speaking, every current and prospective activity of the Air Force will benefit from the many-sided story of air warfare that the AAF has told.

Gathering this archive was a job of huge proportions which, indeed, might have been considered an end in itself. But although hundreds of volumes in its files are worthy of publication, the Historical Office has decided to consider these studies and reports as first narratives. They will be available for constant reference by authorized military agencies and circulated wherever they may be officially useful. But the final history of the AAF will wait more rigorous search for facts and more critical analysis.

That critical analysis is already under way. The editorship of the official history has been delegated to Lt. Col. W. F. Craven of New York University and Major James L. Cate of the University of Chicago. Contributors, selected from among key personnel of the AAF historical program,

are university professors of history who will devote their spare time to the project for the next five years. In summer months, the staff will gather at the AAF Historical Office in Washington for further research and collaboration. In this editorial plan both the Air Staff and the War Department Historical Division have concurred.

Assurance of an authentic history of the AAF was the result of gradual development. It was four years ago that President Roosevelt wrote the Director of the Bureau of the Budget expressing his desire that all war agencies "draw upon whatever scholarly talent may be necessary" to produce ob-

jective analyses of their administrative problems during the war years. Simultaneously General Arnold and the Air Staff pointed out the desirability of keeping an accurate account of plans, policies and operations throughout the AAF. First requirement was an agency "capable of writing our history while it is hot." This undertaking, General Arnold emphasized, was to be "a clear historian's job without axe to grind or defense to prepare."

As a result of those initial directives there are now available for staff use complete and accurate accounts of nearly every AAF activity in World War II. The 170,000 historical reports, together with their supporting documents, record the experience of almost every base, detachment, squadron, group, wing, command or division, air force, and theater air organization in the AAF. Historians have seldom had a bigger story to tell, or told their story on a bigger scale. ☆

## Schedule For Publication

**U**nder the editorship of Lt. Col. Bayard Still, on leave from Duke University, and Major John T. McCoy, New York artist, the AAF Historical Office has prepared the Official Pictorial History of the AAF. It is scheduled for forthcoming publication by Duell, Sloan and Pearce.

Organizational histories written in the AAF historical program will not be given general publication. They are background studies of military aviation intended for official use. Many of them are secret. From these sources, the official seven-volume history of the AAF will be written, but its publication is not expected for some years.

Meanwhile, numerous popular accounts of the AAF are being published. Some, like the volumes planned by Personnel Narratives, are based on official records; others are informal souvenir volumes. Inquiries concerning popular accounts of AAF organizations may be addressed to The Adjutant General (Attention: Historical Records Section), Washington 25, D. C. That office, however, does not take orders for such volumes.



# EUROPE A YEAR AFTER

## The First Anniversary of V-E Day Finds the Army Air Forces in Europe Depleted by Demobilization and Redeployment

**O**n the Champs-Elysees near the Arc de Triomphe in Paris the AAF has taken over a large store which is headquarters for a USAFE outfit that is distributing food, clothing, bicycles and other highly prized commodities to French people who gave assistance to Air Force personnel shot down during the Nazi occupation. The names of thousands of persons are on file, many of whom have received decorations for acts of bravery in helping Allied aircrew members escape German capture. Most of the names were procured from statements made by the escaping men after they returned to England.

In Holland, patriotic Dutch who had aided escaping crew members also were presented with useful commodities as a token of Allied appreciation. Thousands of bicycles which were collected from evacuated air bases in Britain were distributed to these Hollanders.

In Holland, and elsewhere across the face of Europe, AAF Graves Registration outfits are working hard trying to track down the burial places and names of Air Force personnel. A second lieutenant in charge of the Graves Registration unit in Amsterdam told me: "You've no idea what a tough job this is. When we move into a city like this we virtually have to make a door-to-door canvass for information on the secret burial places of Allied fliers."

A US soldier on the streets of London is now a curiosity and the world-famous Rainbow Corners in both London and Paris have long since passed into oblivion. In Paris there is still a little GI activity but the only Air Force units functioning are the ATC headquarters near the Etoile and the EATS-ATC terminal in the Place Vendome. Villacoublay has been turned back to the French and only is the only field used for AAF traffic. It is now possible to walk through an entire Metro train without seeing a single GI. There seem to be as many jeeps as ever on the streets of Paris, but most of the drivers are US civilians—enlisted men and officers who have taken their discharge on the

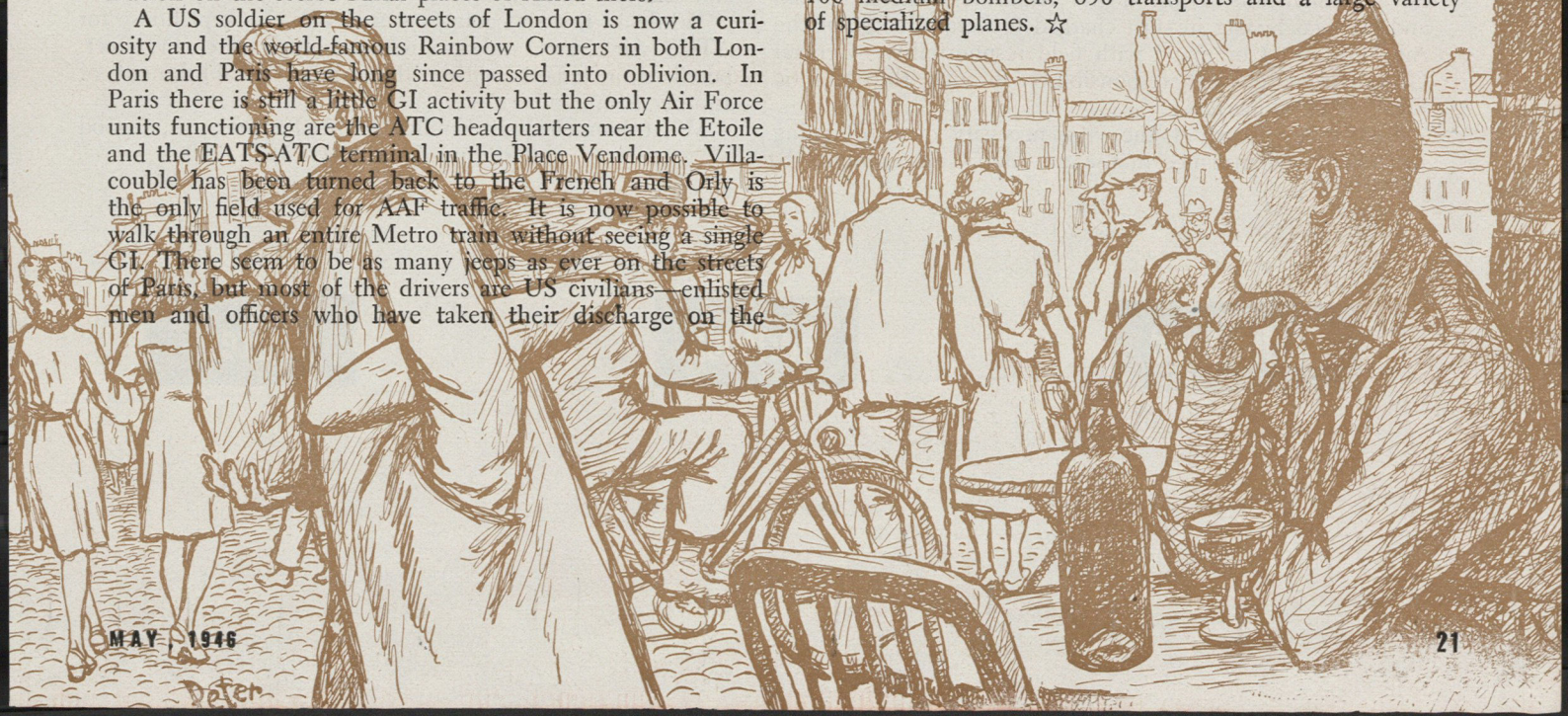
continent and are working for military units in a civilian capacity.

Most of the big hotels on the Riviera have been turned over to their owners and from the volume of advance bookings it looks as if French civilians are going to take up right where the vacationing GIs and officers left off. The big universities at Biarritz have been shut down and about all that remains of the educational program is the unit school classroom which is purely a local function of each air base. Leave-tours for Switzerland and a large variety of other European cities are still conducted. Switzerland's Alps and watches continue to get top billing. An attempt to attract soldier customers to Chamonix, a lavish skiing resort, was a flop.

The small AAF unit which functioned at Barajas airfield near Madrid was finally closed during early March. This unit's sole job was to care for a lone C-47 which came in each week from Paris. The big port city of Le Havre is a real bee-hive of construction activity. At least 40 buildings in the downtown area have been newly repaired or reconstructed from the foundations up.

It is ironical that the only completely repaired, smoothly functioning system of airbases on the continent is in Germany. (See page 12.) Repaired by USAFE engineers with the help of Jerry labor, these bases were planned for use by the occupation Air Force, but many of them are badly undermanned or not in use at all. On January 21 an AP dispatch carried in the Paris edition of the STARS AND STRIPES stated: "The American Air Force which once ruled the skies of Europe has been so damaged by redeployment of personnel that it would take at least three days to bring one squadron of 16 fighters into action and a week to get one squadron of medium bombers into effective operation." There are plenty of planes around but the big trouble is that the peak force of 450,000 men in the theatre on V-E day had dwindled to 39,000 by February 1. Slowly, USAFE has been building its strength up to the 70,000 which is the estimated operating strength of the occupation Air Force.

Most of the 9,000 planes which were in the ETO at the first of the year have either been destroyed or "pickled" (parked in open fields or hangars). It is planned that the occupation Air Force will have 2,700 planes at its disposal, among which will be 200 long awaited B-29s. In addition to the Superforts, plans call for 750 fighter-bombers, about 100 medium bombers, 650 transports and a large variety of specialized planes. ☆





# The AAF comes of Age

**No Longer a Tenant, ATC Assumes Full Control of all American Troops at Atlantic Bases**

**By CAPT. H. P. ANDERSEN**     *AIR FORCE Staff*

**T**he Air Force has come of age. For the first time in history, the AAF has been given military command of all US Army troops, communications and bases in a geographical division.

Coast artillerymen and infantrymen based from Iceland to the South Atlantic now wear the Air Forces shoulder patch. The vast area between America and Europe and Africa, excepting in the Caribbean, is the responsibility of the Atlantic Division of the Air Transport Command. In its new peacetime role, ATC has a mission far beyond the operation of a through overseas military airline, its primary wartime function. Already set up at Atlantic bases, it was proper that the AAF should give to the Atlantic Division of ATC command responsibility for all American troops at the division's overseas bases and the charge of field implementation of US military policy.

During the war military command for American forces in Bermuda, Newfoundland, Greenland, Labrador, Baffin Island, Eastern Canada, Iceland, the Azores, Ascension Island and Brazil was charged to the Eastern Defense Command, the European Theater of Operations, the US Army Forces in the South Atlantic and other theater type commands. Since January 1, 1946, all these wartime combatant headquarters have been removed from command in the Atlantic and such US Army interests as remain in the areas placed under Army Air Forces authority.

When the War Department gave the AAF responsibility for all American troops in the Atlantic, General Arnold and General Spaatz in turn charged General George of the Air Transport Command with field responsibility. General George exercises that responsibility through the Atlantic Division Headquarters.

Firmly convinced of the vital necessity of maintaining American predominance in the air, Maj. Gen. Laurence S.

Kuter, commanding general of the Atlantic Division, has gathered about him outstanding AAF talent. From his headquarters at historic Fort Totten on Long Island—the pre-civil war bastion designed by Capt. Robert E. Lee to protect New York Harbor—General Kuter and his staff direct long range air transport and apply national policy to an area covering more than 26,493,750 square miles. It is a big step for an air staff to command former ground force functions.

Asked to describe the Atlantic Division's mission, General Kuter opened the doors to his staff conference room and made use of graphic wall maps. Only in an air age could one headquarters supply and control such a vast command as that of the Atlantic Division which he indicated on the charts. Divided into five overseas commands, the Atlantic Division's mission varies somewhat according to the locations of these commands. For example, a mid-Atlantic base primarily services our military airline.

During the war ATC's overseas divisions concerned themselves chiefly with operating through military airlines which rushed high-priority shipments to every part of the globe. In 1945 alone, planes of the Air Transport Command employed in overseas operations flew more than enough miles to make a thousand round trips to the moon. While piling up this distance of 498,903,695 transport miles, ATC carried an estimated 4,386,704 passengers—the approximate population of greater Chicago—and over one and one half million tons of cargo.

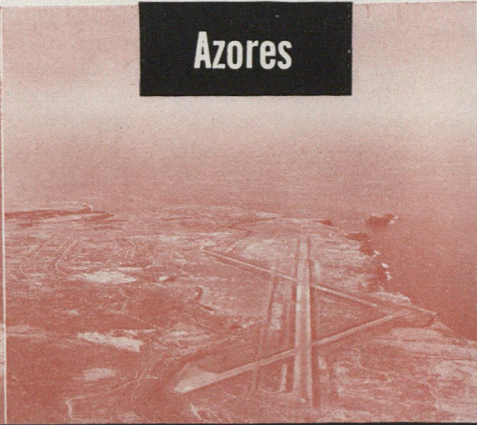
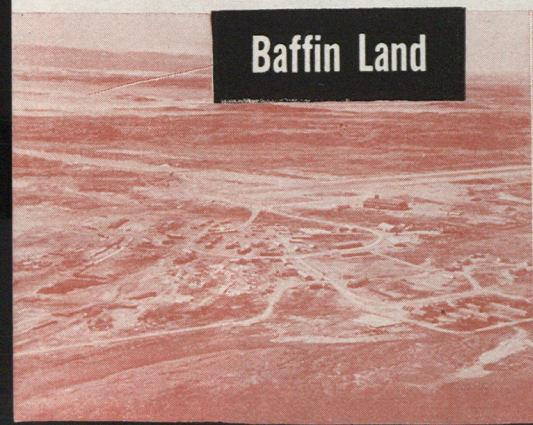
While all this was going on, someone else kept house for ATC. Air crews and ground personnel were, in effect, boarders or tenants within the military establishment of another command.

What happened at Kindley Field, Bermuda, is a good  
(Continued on Page 25)

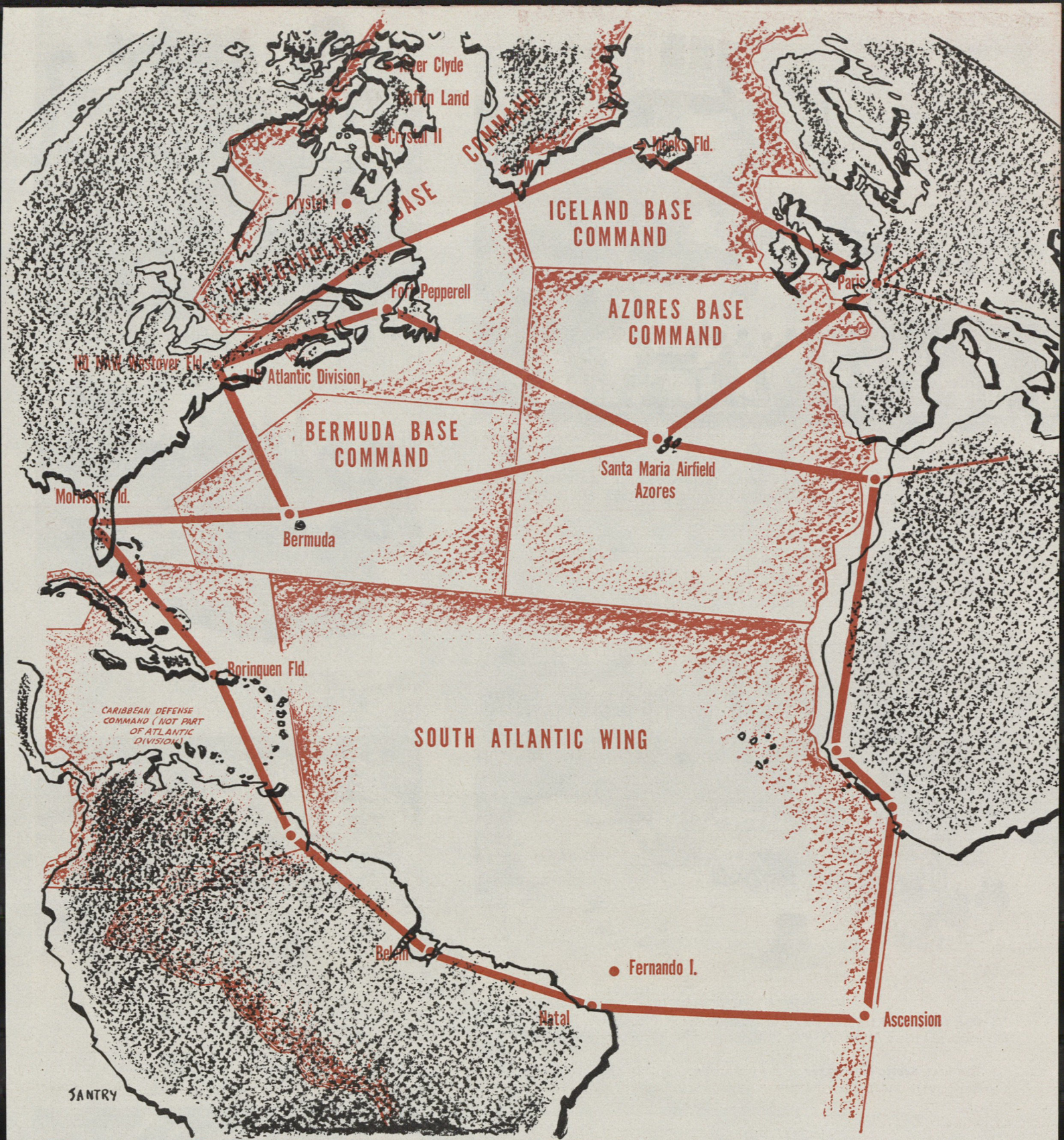
**Baffin Land**

**Bermuda**

**Azores**



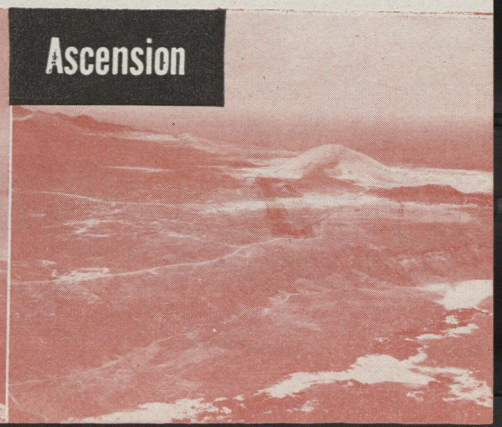
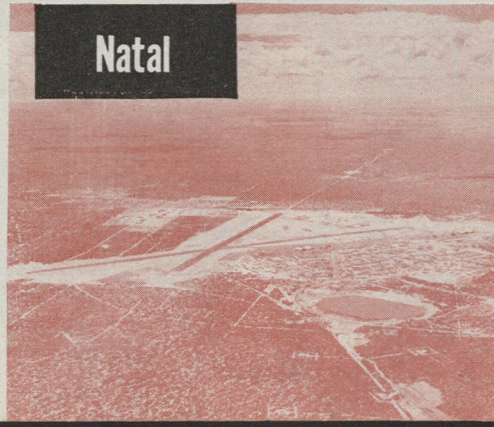




Natal

Fernando I.

Ascension







**Eskimos gather round** an ATC search and rescue plane at Crystal II, Upper Frobisher Bay, Baffinland. Inland, ice-capped mountains rise to 10,000 feet.



**Eskimo kids** are popular with our troops in the Arctic. Their fathers operated fire fighting apparatus on base.



**Dog teams are trained** by ATC rescue crews at Goose Bay, Labrador, where snow reaches a depth of 14 feet. Bases were built from spruce cut in the area.

**The first Arctic helicopter** rescue was made with this craft. Here GIs place a canvas mat under the helicopter as it settles, to keep pontoons from freezing.



**What the Jeep** is to a base like Natal, Weasels are to Arctic depots. They work in mud, snow, sand and water.



**Skiing** is a major sport for GIs at Ikateq, Greenland.

**Roped for safety**, crew drops mail to isolated stations.





## THE AAF COMES OF AGE

(Continued from Page 22)

example of ATC's new responsibility. There, ATC was a fraction of the Bermuda Base Command during the war. This command was made up of several thousand ground forces men who ran the entire establishment and were responsible for all base military functions such as police, sanitation, housekeeping, supply, radar activities and defense of the base. The base command also was responsible for all American military relations with the British, the Bermuda Colonial Government and all Allied forces in Bermuda waters, as well as for cooperation with the US Navy. It was directly subordinate to the Eastern Defense Command at Governors Island, N. Y. Now, all those jobs at Bermuda have been handed over to the Army Air Forces.

While the number of transport planes operating over ATC global routes has been reduced, the function of running a through military airline remains a great responsibility for the Atlantic Division, and this duty is accompanied by headaches of demobilization. The division is responsible for demobilization and return of all eligible US Army troops within its jurisdiction both at home and abroad. In 10

is no backlog of mail addressed to service men in Europe, Africa and India-Burma.

It is obvious, General Kuter feels, that the Atlantic Division must extend itself in every way to give new, untrained personnel required technical training while they are actually on the job. In other words, so that the new GI at Natal won't be just sitting there waiting for the plane to come in, he will be taught to play his role in the continued improvement of airline service.

Now operating 94 C-54 transports over 36,000 miles of international air routes, ATC has three times the number of four-engined aircraft operated by all American civil carriers combined over the same routes. This radical reduction in ATC transports from the number operated during the war is geared somewhat loosely to the increase in operation proposed by civilian air carriers. In this field the Atlantic Division is taking extraordinary steps to make AAF techniques and experiences available to commercial lines.

Air-sea rescue units of ATC, charged with the never-ending task of patrolling the North and Central Atlantic air lanes to pick up survivors of downed aircraft, stand ready to assist commercial airliners in trouble. In April, this service was bolstered by 16 additional rescue aircraft com-

## ◀ Life at Arctic Airbases

weeks this spring the command demobilized 5,000 enlisted men and officers, and 95 percent of the replacements have had no technical training in the airline operations field in which they will be engaged. Pointing to this situation, General Kuter said, "We therefore find ourselves demobilizing our most experienced personnel, while at the same time we are charged with an extensive airline operation which provides our occupational troops in Europe with essential mail, supplies and high-priority military personnel."

Just how well the Atlantic Division is performing this part of its mission is apparent with the announcement that in March all first class mail as well as all air letters to occupation troops in Europe and Africa were flown by ATC—a total of about seven million letters. Mail racks are cleared daily at the NYPOE; over 7,000 pounds of letters are loaded on planes each day at Westover Field, and there

plete with qualified crews. Outfitted with the most recent improvements in standard rescue equipment, four of the planes are lifeboat-carrying B-17s. The others include six C-54s and six C-47s. They are assigned to patrol an area stretching from Goose Bay and Iceland, down to Bermuda and the Azores. In addition to rescue planes, helicopters and boats are in service. At stations in the Caribbean are units of a "splinter" fleet held ready to cruise with AAF crews for 600 miles at 21 knots to pick up survivors of any plane, commercial or military, down in the sea.

"American flag carriers are assured of our maximum efforts to make our bases and experience available to them," General Kuter explained, "with the sure knowledge that American leadership in civil air transportation is an essential component of predominance in all phases of air power." ☆

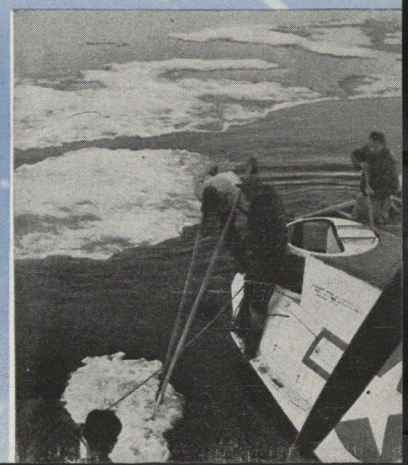
**A native** gives instruction in igloo building. Eskimos also taught Americans spear-fishing.



**More than 80** GI-built log cabins, like this one for recreational purposes, dot the Labrador wilderness.



**Take-off stretch** is cleared at River Clyde, in Far North.





# V-2 ROCKETS OVER NEW MEXICO

**C**aptured German V-2 rockets will be launched for the first time in this country on the White Sands, N. M., Proving Grounds in a series of tests beginning on May 10 and continuing throughout the summer. The tests, conducted by the Research and Development Service of Army Ordnance Department, in cooperation with the Army Air Forces, are expected to provide valuable technical data for engineers engaged in perfecting larger and faster rockets. In these tests, 25 rockets will be fired, the first 10 by Ordnance, 10 by the AAF and 5 by the Navy.

A preliminary "shakedown" firing took place on the proving grounds in late March. There, against a background of sawtooth mountain peaks on three sides and a seemingly endless expanse of rugged desert on the other, this particular rocket's glare produced the most spectacular pyrotechnical display seen since the world's first atomic bomb was detonated in this same Alamogordo area last July.

Statically fired to determine its readiness for actual take-off, the V-2 was held in place while the 18,000 pounds of alcohol and liquid oxygen in its fuel compartment burned in less than a minute, pouring through the exhaust a violent flame visible for miles. Spectators declared it was the most intense blaze they had ever seen. Turbines, pumps, steam plant and other thrust units met all advance requirements in the test and the 15-ton, 49-foot V-2, or A-4 as it is known to Army technicians, is now considered ready for flight.

Many V-2 units were captured in the final stage of the European war. They were dismantled and shipped to the White Sands base. Each unit was torn down, parts were salvaged, studied, rebuilt, and tested for months. Some of the missing parts were manufactured by General Electric Company. German V-2 experts, who volunteered their services to the AAF and Ordnance in Europe, are now helping to re-assemble the rockets at White Sands, first active proving ground for guided missiles in the United States.

The New Mexican site is considered a great improvement over any in Germany, according to Maj. Gen. G. M. Barnes, chief of Ordnance research and development. "The Germans were tremendously handicapped, both from a lack of space and adverse atmospheric conditions which prevented observation of V-2s through their entire flight," explained General Barnes. "Unless you can check and measure them accurately through their entire trajectory, you can't learn everything you need to know about them. The clear atmosphere in New Mexico will give us almost perfect conditions under which to study rockets' velocities, trajectories, control, flight characteristics and maximum distances they can penetrate the stratosphere."

Although 62 miles above the earth was the German altitude record for V-2, it is expected that the rockets to be launched this summer will exceed the 100-mile mark. Con-

trols will be so adjusted that the flight of the V-2 will be more vertical than was the practice when the Germans fired the missiles toward London, Antwerp, and Liege during the war.

"Acceleration of the V-2 is slow at first," said Lt. Col. Harold R. Turner, CO of White Sands Proving Ground, an Air Corps observer in World War I, and later developmental engineer at General Electric, "but it reaches a maximum speed greater than 3,300 miles per hour. It hits the earth at a speed of 1,800 feet per second, and we are able to determine fairly accurately just where it will land. By changing the controls, I think we can send the rocket about twice as high as the Germans did."

In combat the rocket carried in its warhead explosives equivalent to a 2,000-pound bomb. "The V-2s we launch will carry no explosives," said Colonel Turner. "The purpose of the tests is to determine the range and control of rockets and to find out all that the Germans knew about them."

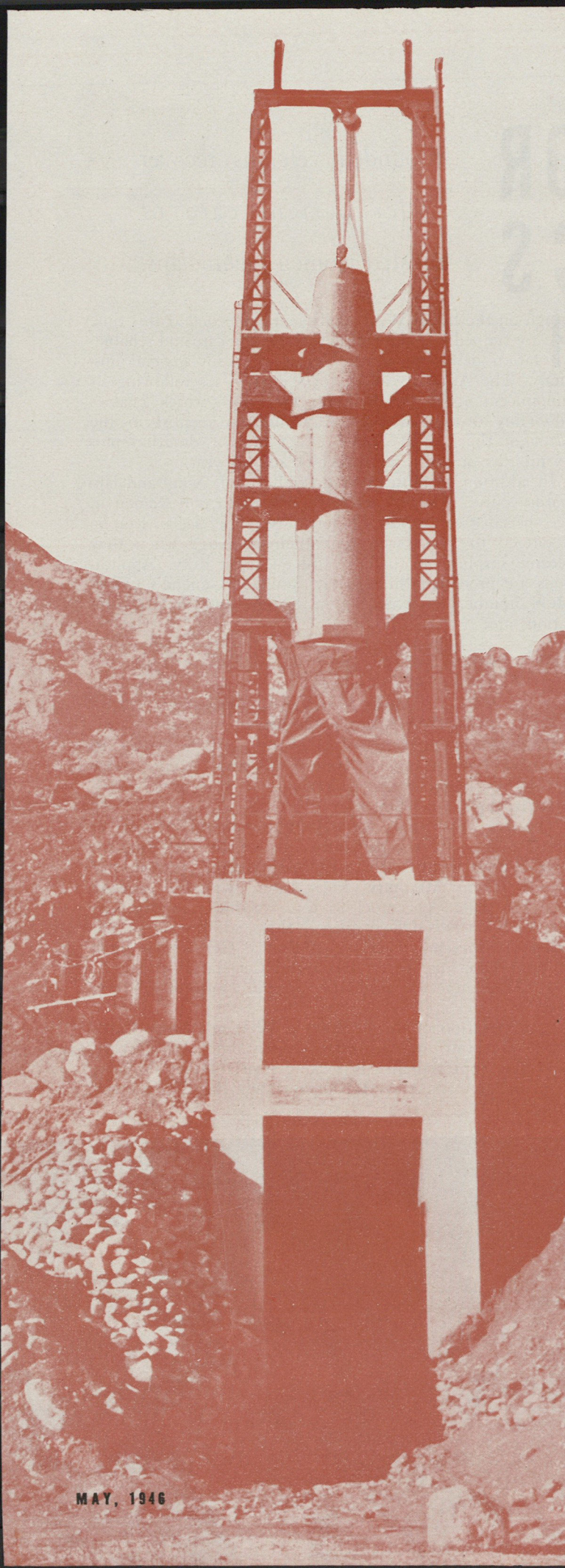
In addition to the investigation of the upper air by means of instruments carried in the rocket, the AAF will take advantage of the tests to develop countermeasures and methods of early warning. Two different types of ground radar sets, the war-famous SCR-584, equipped with the automatic-tracking devices which proved such a boon to fighter control and AAF units on the battlefronts, plus still further modifications for rocket-tracking, and the newer microwave early warning AN/CPS-6, will be set up at Alamogordo Army Air Field some 40 miles east and north of White Sands. From these stations, AAF, Signal Corps, and Watson Laboratory personnel will attempt to track the course of the V-2 in its meteor-like flight.

"If we can find some means of tracking the missiles and determining their arc of flight in advance," said Brig. Gen. W. L. Richardson, chief of the AAF's Guided Missiles Division, "it may be possible to design a controlled counter-attack rocket which will be capable of intercepting the enemy rocket at a predetermined point in its course. It is obvious that a means must be found to defend our country against a sudden enemy rocket attack and this must be done as quickly as possible."

In addition to radar, the tracking system used by the Army is that employed by the Germans. In fact, actual German equipment is now installed at White Sands. It consists of Askania theodolite checkers which are capable of locating accurately the missile in space. As it photographs the V-2 in flight, it also indicates visually by means of superimposed markings elevation scale and azimuth. By means of triangulations from three such machines, it follows that exact trajectories can be plotted.

How to determine the exact altitude the V-2 reaches was explained by Major Herbert L. Karsch, Chief Proof





## The Army Air Force will attempt to track V-2 rockets when they are fired over the White Sands, N. M. Proving Grounds this summer

Officer for the White Sands installation: "If you once determine the velocity and the trajectory of the missile, then it is only a simple mathematical calculation to determine the zenith." In addition to the theodolites, Major Karsch also will depend on high speed motion pictures for technical evaluation. He uses a Mitchell high-speed camera, which takes 148 frames per second and has a 17-inch telephoto lens.

Launching platforms set in heavy concrete, similar to those used by the Germans, are now being rushed to completion preparatory to the spring and summer White Sands tests. The V-2 is set in place by a steel elevating boom known as the Meiller Wagon, designed in Germany for this purpose. By means of a hydraulic lifting system the rocket is placed in a vertical position, its tail resting on the ground. Elaborate steel framework on the launching platform enables workmen to climb built-in ladders to make final adjustment after the rocket is in firing position.

A special site was constructed for the recent static-firing test. It is known as an A-frame, consisting of a massive wall-like structure with heavy steel girders on top which hold the rocket in position, and a 35-foot shaft below, through which pour the exhaust flames from the V-2's thrust unit. The concrete walls of this shaft, built on the side slope of one of the Organ mountains, are 30 inches thick, heavily reinforced with half-inch steel boiler plate. To cool the flames down during a test 2,000 gallons of water a minute are forced into the shaft. Nevertheless, during the initial test last month, the flames shot down with such heat and velocity that huge sheets of heavy steel were ripped loose and sent flying out into the desert like pieces of cardboard.

Technicians who remained close to the blast in a sand-bagged control room reported that the tremendous roar of the exhaust from the V-2 as it is being fired is acutely painful to the ears.

Although the V-2 project seems to dominate the present scene at White Sands, actually the first rocket of any type to be fired on its proving grounds two months after the installation was set up, was one of our own—a 16-foot, 1,000-pound rocket called the "Wac Corporal." Developed by the California Institute of Technology for the Army, the "Corporal" was launched on September 15 and soared 43½ miles into the air, setting a new American altitude record. Considerably smaller than the V-2, this rocket uses a liquid propellant of hydro-carbon and oxidizer. Its function will be to speed into the sub-stratosphere in search of weather and temperature data otherwise unobtainable. Automatic recording instruments will be parachuted by means of an ejection system, set to open at a pre-determined altitude, installed in the nose of the missile.—Charlotte Knight. ☆



# ARMY CALLS FOR SKILLED WACS

*Wounded veterans recover under patient care of enlisted women technicians.*



Helping a soldier's fingers work again, Wac occupational therapist is shown above instructing a blind veteran on a loom. Exercise in a Hubbard Tub to regain use of limbs is supervised by skilled technician Rosemary McElwee, below left. Checking flight plans, as Cpl. Lillian Levine is doing, lower right, is another specialty.



**H**igh on the list of WAC skills acutely needed at this time are trained hospital technicians for the care and rehabilitation of wounded veterans in all Army general hospitals. The Army is calling for skilled Wacs following its announcement of the Re-entry Program," which enables honorably discharged enlisted women to reenlist in the Army of the United States, either for the duration plus six months or until September 30 of this year.

In addition to those needed for hospital, X-ray and laboratory duties, overseas service is offered to 600 women in five specialist categories. Opportunity for service in Europe is offered to Wacs who took their discharge when they became surplus and to those still on active duty. Applications are processed through the Adjutant General's Office. MOS numbers now needed in Europe and their classifications are:

- 213—Stenographers
- 450—Clerk Typists
- 055—Clerks, General
- 650—Telephone Switchboard Operators
- 237—Teletypewriter Operators

Grades held at time of discharge will be given to members of the Women's Army Corps who can qualify for and desire assignments as technicians in Army general hospitals in the United States.

The first opportunity for training as surgical, medical or dental technicians was presented in a course extending for three or four months at the Enlisted Medical Technicians' School, Camp Atterbury, Ind. Later, with the growing need for skilled personnel to care for the wounded, the Surgeon General's Office opened three additional enlisted schools to women. They are at Brooke General Hospital, Ft. Sam Houston, Texas; Beaumont General Hospital, El Paso, Texas; and Fitzsimmons General Hospital, Denver, Colo.

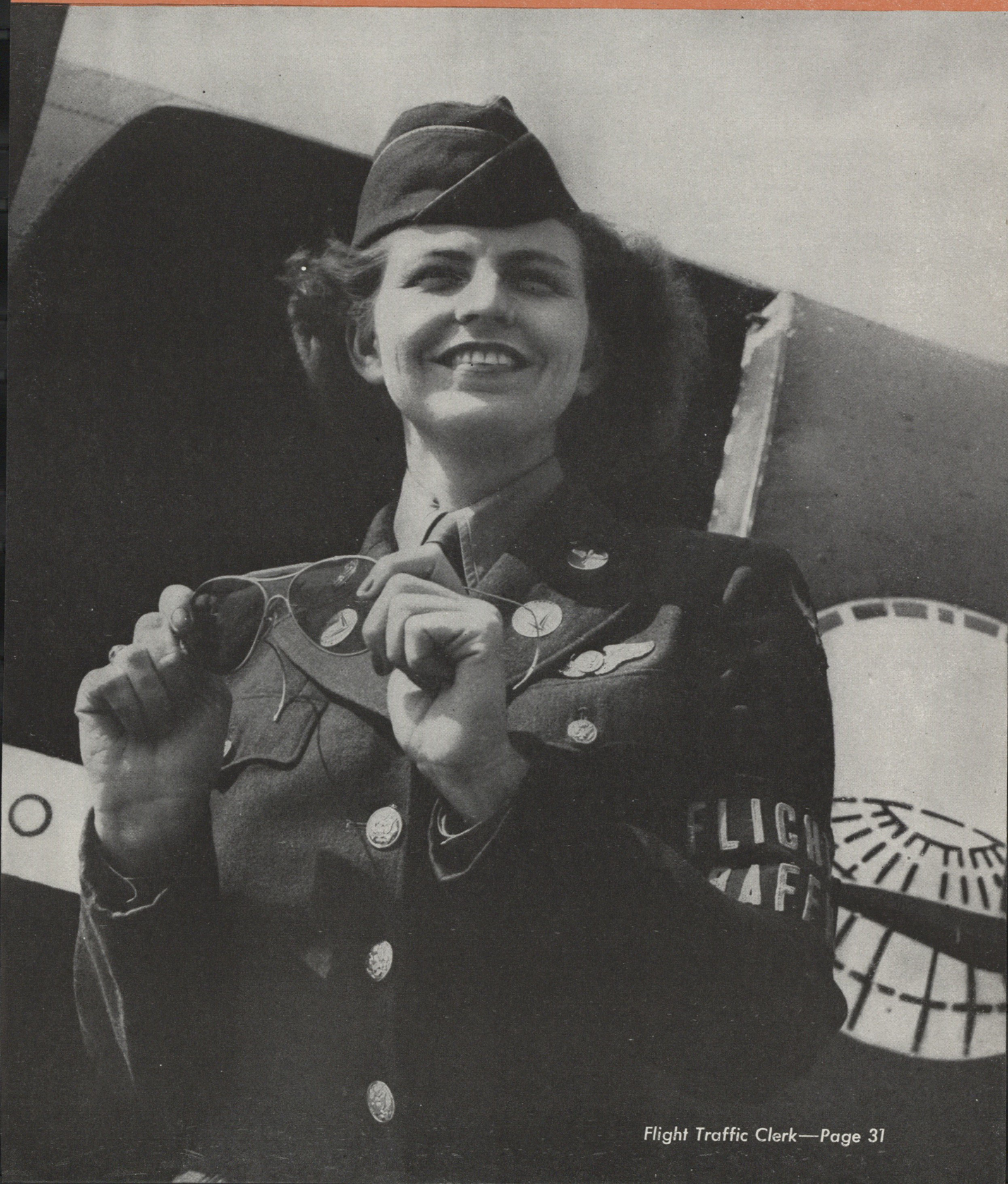
In recognition of the need for a Women's Army Corps in the peacetime military establishment, the War Department has approved and is seeking legislation establishing a small, permanent WAC organization in the Regular Army. ☆





News and Views around the World

# CROSS COUNTRY





## Peace, It's Wonderful!

If you don't think so, ask the men of the new 5th Air Force. They are now fishing in the waters they once devastated when knocking out Jap surface targets. Along with peace in the Pacific came a reorganization of the 5th, the occupation air force; and along with reorganization came an emphasis on recreation.

Recreation and personal comforts are receiving a major share of attention by Maj. Gen. K. B. Wolfe, CG, 5th Air Force. In March the outfit went on a 40-hour week. In the additional free time that came with this change, officers and enlisted men began using the rest and recreation facilities of the 8th Army and by summer will have their own resorts and playgrounds.

The recreation program planned by General Wolfe will enable men to spend time at former Japanese resorts in the mountains and by the sea. The 5th has acquired a few resorts and is planning more, including a complete fishing village, a country club with golf course and various seaside rest camps. When units move from one part of Japan to another, the men will be given a chance to use recreational facilities near their base. Whenever possible, units will be moved so they can be in various parts of Japan during the best seasons. According to General Wolfe, anyone serving with this Air Force should be able to see all he wants of Japan and Korea.

But don't get the idea the 5th is a playboy's paradise. There's work to be done, too. The occupation mission as set down by General Wolfe is to maintain constant aerial surveillance of the Japanese home islands and Korea. It must be ready to assist the Ground Forces in the suppression of internal disorders. And it must take its place in our new aerial frontier, the Pacific Air Command. To accomplish the surveillance mission, the 5th must maintain combat efficiency and mobility with its units strategically located in Japan and Korea. As an outpost on our aerial frontier, it must provide facilities for the staging of other PACUSA units.

Also, the Fifth operates its own inter-island air transport system and supplements ATC services by performing some of the housekeeping tasks for that organization.

The 5th will conduct a training program designed to insure efficiency in all phases of aerial operations. At present, the training program is in its infancy and is more of a plan than an actuality. Like most other units, the Pacific air forces were hit hard by demobilization, which was able to do what the enemy never could—drastically reduce the AAF's striking power. Now, it is necessary for the 5th to rebuild what is left and to train newcomers to the organization. Recruits will be given basic training in their own units and, after classification, will start their training, not in schools, but on the job itself.

To assist and speed this program General Wolfe has requisitioned through PACUSA 1,700 civilian technicians. These civilians, many of whom are expected to be former AAF mechanics, will supervise the opera-

tion of ground echelons and assist in the training of ground crews.

Under the reorganization plan, as it is constituted at present, the 5th will become a small, closely-knit air force, capable of making its maximum strength known anywhere in Japan or Korea. The Air Force will be composed of a group of self-sufficient task forces. These are the old bomber and fighter commands and wings—all retaining their wartime designations. Their headquarters are at the bases considered strategically most important when invasion of Japan was planned. The task force organization and composition will vary with location, but each will have fighter aircraft as its chief component. Some groups will be supplemented by light or medium bombers and some by transports. Within each task force area there will be auxiliary bases which could be used in emergencies. For administrative purposes and during routine occupation operations, all units are under the control of their base commander. In the event of combat, tactical units will be under the direct control of the task force commander and service units will remain under the base commander. To maintain mobility, tactical and service units will be moved from one part of Japan to another for short periods of service. ☆

## Victory Through Air Power

From the standpoint of German economy, the most destructive offensive was that conducted by the AAF against the German transportation system. This offensive was the most important single cause of Germany's ultimate economic collapse.

These conclusions were announced in a newly released study, "Effect of Strategic Bombing on the German War Economy," made by the United States Strategic Bombing Survey under the direction of John Kenneth Galbraith. The effect of bombing on each aspect of the German economy was examined in detail during the course of the study, and German production officials were interrogated by members of the Survey staff.

The report maintains that although the German cities suffered heavily in air attacks prior to the Spring of 1944, the effect of these attacks on Germany's war potential was not appreciable. However, the attack on the transportation system, which had to await a sufficient build-up of the bombing force to be effective, reached its peak in the Autumn of 1944 and the early months of 1945. Largely as a result of these attacks, the German economy deteriorated rapidly in the last months of 1944 and the collapse became complete in early 1945. Freight car



2nd Lt. E. R. Fajaro—he flies to work.

## Commutation By Air

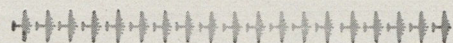
The day of aerial commuting is here. 2nd Lt. E. R. Fajaro, base ordnance officer at Andrews Field, Washington, D. C., commutes between the field and his home near Anacostia in a PT-19. Lieutenant Fajaro purchased the plane from the RFC. He intends to sell or trade it for a larger one in order to make week-end trips to San Juan, Puerto Rico, his permanent home.

"A commercial airline would charge about \$215 each way," the lieutenant said, "but with my own plane it would cost only around \$50 and there wouldn't be any schedules to worry about." He would like to get a Republic Seabee, which is amphibious and carries four passengers.

loadings fell approximately 50% between August and December. Further effects of strategic bombing were a 20% loss in the production of motor vehicles, a reduced steel output in the Ruhr of 90%, a 20% loss in panzer production and a loss in armaments output somewhere above 15%.

After December 1944, intensified air attacks on transportation prevented supplies from reaching the troops at the front and shut off the supply of coal and steel from the Ruhr. From December to January 1945, output of finished munitions dropped 14%; manufacturing production, except basic iron and steel products, 24%; manufacturers' shipments 32%; aviation gasoline 56%; and freight car loadings 20%. ☆





## Flight Traffic Clerk

Meeting qualifications similar to those prescribed by commercial airlines, WAC Flight Clerks are flying as regular ATC crew members on the "Statesman" run between Washington, D. C. and San Francisco.

WAC stewardesses were used experimentally last June on flights between London and Paris. Bucket-seat veterans were amazed on stepping into a C-47 to find themselves in swank surroundings that included plush seats and a pretty flight clerk to put their coats on racks, strap them in and make a little orientation speech before takeoff.

Response of the GI and VIP passengers was so enthusiastic that a WAC flight clerk school was opened at Morrison Field, Fla., last October. Typical graduate of the school is Pfc. Dorothy P. Linke, 23-year-old Smith College alumna from Plainfield, N. J. She is one of 10 Wacs assigned to the all-passenger Statesman flight operated by the Ferrying Division of ATC. Every 10 days Private Linke makes a round trip across the United States. Her home base is at Topeka, Kan., Army Air Field, where the C-54s make their only stop between East and West coasts.



WAC stewardess Dorothy Linke.

Before departure she checks passengers aboard the four-engine transport plane, relieving the pilot of bothersome paper work, thus enabling him to concentrate on flight plans. In the air she does whatever may be necessary to make the trip a comfortable one. This includes serving hot meals which are placed in the plane's galley just before takeoff, handing out magazines or "urp" cups as the passenger chooses.

"Meeting people is what I like best about my job," Private Linke said. The people she meets are service personnel of every rank from private to general, the majority of them newly returned from overseas assignments. ☆

# QUESTIONS

## on Policy and Procedure

**Q.** Is the legal representative of the estate of an Air Corps Reserve Officer entitled to the \$500 bonus which is authorized to be paid to such officers?

**A.** Yes. The Comptroller General has held that the legal representative of the estate of an Air Corps Reserve Officer killed in active service is entitled to the \$500 bonus which is authorized under law. The Air Judge Advocate states that such claims should be filed with the General Accounting Office, Washington, D. C.

**Q.** What is the reenlistment time limit for enlisted men to be eligible for reenlistment furlough?

**A.** An enlisted man must reenlist within 20 days of the date of the discharge to be eligible for the reenlistment furlough. The extension of 90 days for reenlistment in grade does not pertain to the reenlistment furlough.

**Q.** Is the six months' gratuity pay, payable upon death of certain military personnel, exempt from indebtedness?

**A.** Yes. The six months' pay cannot be used for the debts of the officer or enlisted man, including overpayments. (AR 35-1540, par 4.) Gratuity pay cannot be attached or garnished for the officer's or enlisted man's debts because it is not a part of that individual's estate but a gratuity to his dependent.

**Q.** Does an officer hospitalized while on terminal leave use up his leave time?

**A.** No. Any officer of the Army who is admitted to an Army hospital while on terminal leave prior to separation from active service will be considered to be on a duty status from the date of admission to the hospital. Upon discharge from the hospital the officer's terminal leave will be recomputed. The terminal leave used prior to hospitalization will be considered as ordinary leave. (AR 605-115, as amended by C 1, 16 January 1946.)

**Q.** Are Warrant Officers, who are temporarily commissioned in the Army of the United States and who continue to serve on duty as commissioned officers, entitled to carry forward their accumulated leave

into their commissioned status?

**A.** Yes. The Comptroller General has ruled that the leave may be carried forward. This is true for those who served as Warrant Officers either in the Regular Army or the Army of the United States.

**Q.** What is the minimum time in grade for AUS officer promotions?

**A.** For promotion to colonel, 30 months; lieutenant colonel, 24 months; major, 24 months; captain, 18 months; first lieutenant, 18 months. (Par 5, AR 605-12, as amended by C 3, 6 February 1946.)

**Q.** May authorized baggage still be shipped to a designated place for storage upon permanent change of station?

**A.** The authority now contained in par 14a (1), AR 55-160, 26 April 1943, for an individual upon permanent change of station to ship authorized baggage to a designated place for storage for the duration of the war, was rescinded by sec II, WD Cir 21, 1946. However, shipments at Government expense may continue to be made to storage points at a cost not in excess of

what it would cost for shipment between the two duty stations; shipments to other points may continue to be made at the expense of the owner for excess charges. Under the provisions of par 14a (5) and (6), AR 55-160, shipments may also continue to be made to storage where the individual is ordered upon permanent change of station to a service school or civilian educational institution as a student, and upon assignment to an overseas station. Par 14j, AR 66-160, authorizing the shipment to storage without change of station orders, is rescinded.

**Q.** What personnel may file application for relief from active duty or discharge to accept a civilian appointment with the Veterans' Administration?

**A.** Officers, warrant officers, and enlisted men or women, other than Regular Army, who have completed two years of active military service, whose MOSs are not on the critical list of scarce categories, and who are not eligible for overseas service. (WD Cir 388, 1945.)





## National Aviation Show

More than a score of AAF General Officers were on hand to open the National Aviation Show at New York's Grand Central Palace April 5. Lt. Gen. Hoyt S. Vandenberg, now Assistant Chief of Staff, Intelligence, War Department General Staff and formerly commanding general of the 9th Air Force, urged unification of the nation's military services. Lt. Gen. Nathan F. Twining, commanding general of the Air Materiel Command, pointed out that aviation development must continue without curtailment during peacetime.

Before the program was over crew members of the *Enola Gay*, B-29 that dropped the Hiroshima atomic bomb, arrived to take a bow. They had just landed their now historic *Enola* at La Guardia Field after flying from Roswell, N. M. in 5½ hours to take part in New York's Army Day ceremonies. Four members of the present crew flew on the Hiroshima mission—Col. Paul W. Tibbets, commander and co-pilot; Maj. Theodore Van Kirk, navigator; Maj. Thomas W. Ferebee, bombardier; and M/Sgt. Wyatt E. Duzenburg, flight engineer. One member of the present crew, Capt. Kermit Beahan, was bombardier on the B-29 that bombed Nagasaki. Two members of the original Hiroshima crew are now separated but were on hand to greet the *Enola Gay* in New York and take part in ceremonies. They were T/Sgt. George P. Carson, tail gunner, and Capt. Robert A. Lewis, pilot, now on terminal leave.

Sponsored by Post 743, American Legion, this first New York air show since Pearl Harbor gave observers a look back at the role of air power in the late war, as well as a look ahead at personal planes now coming off reconverted production lines.

The look back was provided through AAF exhibits prepared by Wright Field's Air Materiel Command, many of which held items never before shown the public. Enemy equipment on display included the German V-2 rocket bomb, ME-262 twin-jet fighter, ME-109 fighter, V-1 buzz bomb, ME-163 rocket plane fueled with concentrated hydrogen peroxide, the Jap Baka suicide bomb and Tojo fighter. American air strength was represented by the Lockheed P-80 Shooting Star, North American P-51 Mustang and Bell P-63 Kingcobra. Other exhibits demonstrated radar and television, wind tunnel techniques, navigational instruments, engines, guided missiles, armament and photography.

The look ahead was provided by light plane manufacturers showing such aircraft as the Republic Seabee, Commonwealth Trimmer and Skyraider, Aeronca, Globe Swift, Luscombe Silhouette, Johnson Rocket, Ercoupe, Taylorcraft, Piper Cub and Sea Scout. ☆

## New Flight Requirements

Desk-bound rated personnel will welcome the revised flight requirements which establish a minimum of 100 hours annual flying time. Effective April 1, the new

regulation states in part: "The maintenance of flying proficiency in the technique of pilot or aircraft observer skills... and familiarity with modern equipment, modern methods and modern techniques... are of paramount importance and will be given first consideration among the duties assigned flying personnel."

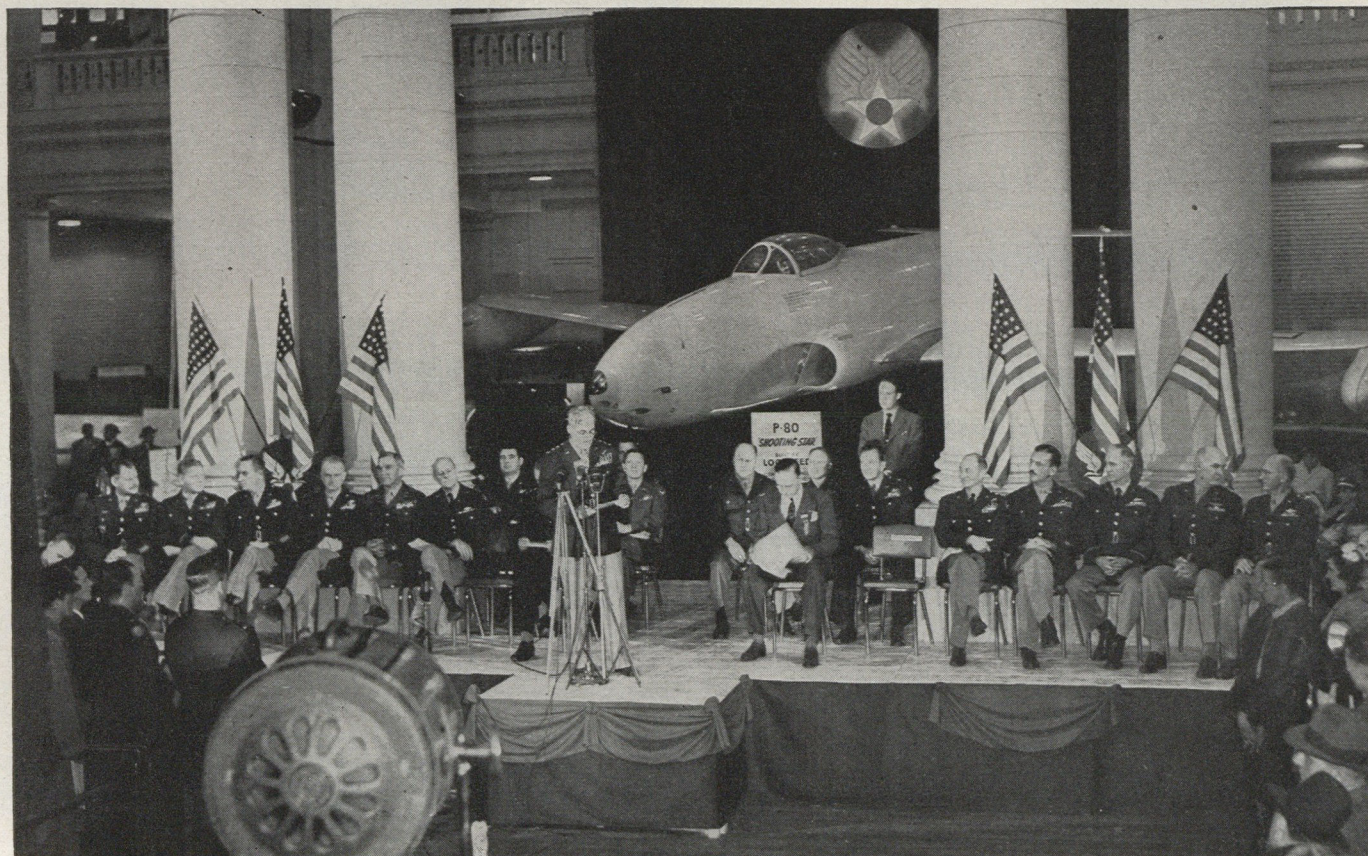
Each rated pilot must fly a minimum of 100 hours, at least 20 hours of the time being instrument (weather or hooded) and at least 15 hours night time. Not more than 50% of the requirements may be met by performing duties of co-pilot, except under specifically named unusual circumstances.

Rated pilots, aircraft observers, technical observers and all non-rated personnel on flying status are required to fly at least 35 hours every six months and a minimum of 100 hours a year. ☆

## Train West Point Fliers

The AAF Training Command is making arrangements to train West Point graduates according to the following announced schedule: Ninety-five graduates will train at Enid, Okla., in B-25s beginning July 18, 1946 and graduating October 20, 1946. 110 cadets have indicated fighters as their choice of training. Of these, 55 will go to Luke Field, Ariz., for AT-6 gunnery, starting July 18 and graduating Sept. 8, 1946; and 55 will undergo training in P-51s and P-47s at Chandler Field, Ariz., starting July 18, 1946 and graduating Sept. 6, 1946.

Lt. Gen. Nathan F. Twining, backed by mass of "brass," speaks at opening of National Aviation Show.







On September 8, 1946, students completing Fixed Gunnery training on AT-6 aircraft will enter Fighter Transition Course, and students completing Fighter Transition training will be entered into the Fixed Gunnery training. Proposed graduation date for both classes is October 20, 1946. ☆

### Better Jobs Clinic

Indicating the Army's interest in the individual welfare of its personnel, a better jobs clinic was held recently at Tarrant Field, Fort Worth, Texas. Several civilians with a business or professional background joined service personnel in discussions of job problems. Sample letters of application for jobs were read and criticized. Among the most common mistakes made were: indefiniteness or uncertainty as to the type of job wanted, wasting valuable words on inconsequential details, lack of specific information as to qualifications.

One captain presented his job problem and it offered a solution for one or two others present at the clinic. The captain, who had extensive experience in business, traveling, education, newspaper and radio work, wanted suggestions on how to get into the highest bracket field of lecturing. Suggestions included that he write a book on some current problem, that he finish work on his PhD degree and that he get a first class press agent. One or two offered to be the press agent. ☆

### WD Sponsors Science

The War Department has inaugurated an integrated post-war program in which particular attention will be given to the recruitment, retention and improvement in service of scientific and technical personnel. Planning in this field will be done by the War Department Committee on Scientific Personnel. It will make studies and recommendations in such fields as recruitment, selection, retention, classification and wage administration, improvement in service and advancement and recognition of persons in the professional fields.

Secretary of War Patterson stated that "one of the principal lessons learned from the recent war is that the security of our nation depends upon the maintenance of a position of leadership in scientific research and development and their timely application to military problems" . . . and that the War Department's policy is to "pursue a vigorous and comprehensive technological program to assure security beyond any question of doubt." ☆

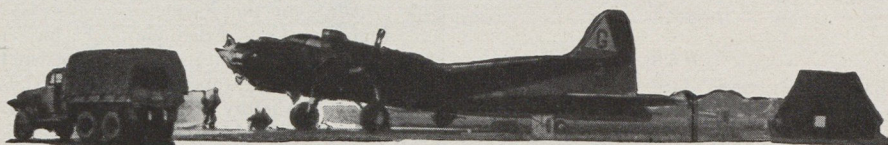
### Aid Society Given Royalties

Among the gifts which have enabled the AAF Aid Society to open offices at every AAF Station in the U. S. are royalties from books. The director of the Society, Maj. Gen. Howard C. Davidson, has announced a list of 10 such volumes, the authors of which have assigned their rights to this program which is carried on for the benefit of active and former AAF personnel. This Aid Society book shelf includes the following titles:

Official Guide to the AAF.

# PLANE BONERS

Analyzed by Veteran Pilots



ALBUQUERQUE, N. M.—During a B-29 preflight the navigator was assisting the engineer. The engineer called for a starter run through for a carburetor pressure check, required on fuel injection type engines. The navigator flipped the wrong toggle switch for the run through on No. 1 engine, energizing instead No. 3 engine starter. The airplane commander was making a visual check of the Superfort's exterior and was struck on his head and neck by the No. 3 engine prop. He was seriously injured.

*Comment: Stand in front of a B-29 during a fuel pressure check. Don't ever walk through props.*

MONTGOMERY, ALA.

A B-29 was in normal flight on AFCE when it suddenly went into a violent dive. Pilot, after turning off AFCE, recovered manually, but not before losing almost 1,000 feet of altitude. Investigation revealed that the right hand life raft had released and hit the horizontal stabilizer.

*Comment: No one was in the vicinity of the release handle so the raft obviously was released because of improper installation.*

SALOME, ARIZ.—After making an excellent landing, an AT-6 pilot relaxed too soon and struck a runway light during his roll. The plane's right wing was damaged.

*Comment: A landing isn't finished until the plane is parked and the switches cut.*

DALLAS, TEXAS—During A-26 run-up, pilot didn't lower flaps because of damage possibility by flying stones during engine run-up. Forgetting that he had not lowered flaps he took off and as soon as plane was airborne retracted landing gear. The plane settled in a nose high attitude and under section of the tail scraped the runway.

*Comment: The A-26's tail will settle after a take-off without flaps.*

BRUNSWICK, GA.—The pilot of a C-47A cleared for a letdown near Macon. At 2,000 feet he was notified that the field had closed in but continued to let down to 800 feet (below minimums allowed for Macon). In an attempt to stay contact, the pilot still continued to let down and the airplane collided with tree tops, washing out aileron control.

He was able to climb to 2,000 feet and make an emergency landing at another field. The airplane sustained major damage.

*Comment: There is no need to say anything more than that this pilot, for wilful violation of regulations, has been reduced to copilot status and is awaiting appearance before a Flying Evaluation Board.*

GARDEN CITY, KAN.—Failure of a mechanic to set brakes or chocks while preflighting a BT-13 resulted in the plane's rolling and colliding with another trainer. Seated low in the cockpit, without the height afforded by a seat-type chute, the mechanic could not see over the cowlings and thus was unaware that the plane was in motion. Both planes were severely damaged.

*Comment: Brakes or chocks must always be set when an engine is being revved up. Otherwise the plane will roll. Moreover, so that his visibility will not be obstructed, a mechanic working in a cockpit should use cushions to provide proper seat height.*

ROMULUS, MICH.—A B-17 made a normal landing, but approximately 5,200 feet down the runway the right gear collapsed. Investigation disclosed that the landing gear was completely down and locked for landing, but that malfunctioning of worm gear caused gear to collapse. The nut on the extension system was not seating properly against the neoprene stop.

*Comment: Faulty maintenance work and inspections.*

PREPARED BY THE OFFICE OF FLYING SAFETY



# NEW BOOKS



## WAR

**BATTLE REPORT; THE ATLANTIC WAR.** Walter Karig. This is volume II of the Battle Report series telling the story of the Navy's war in the Atlantic. N. Y., RINEHART & COMPANY, INC., 1946.

## HISTORICAL

**SOLDIER OF DEMOCRACY; A BIOGRAPHY OF DWIGHT EISENHOWER.** Kenneth S. Davis. The complete story from Denison, Texas to Berlin, Germany. N. Y., DOUBLEDAY & COMPANY, INC., 1945.

## POST-WAR

**ATOMIC ARTILLERY AND THE ATOMIC BOMB.** J. K. Robertson. Mysteries of atomic structure and the background of the new atomic age. N. Y., VAN NOSTRAND COMPANY, INC., 1946.

**SIX WAYS TO GET A JOB.** P. W. Boynton. Practical advice to job seekers by an experienced personnel man. N. Y., HARPER & BROTHERS, 1945.

**THE TECHNIQUE OF PERSONAL ANALYSIS.** Donald A. Laird. Tested ways for fitting your personality to a future. N. Y., MC GRAW-HILL, 1945.

## TECHNICAL

**AIRCRAFT ELECTRICITY FOR THE MECHANIC.** Charles E. Chapel. Complete practical course for electrical workers in aviation; suitable for home study. N. Y., COWARD-MC CANN, 1946.

**AVIATION: WHAT EVERYONE SHOULD KNOW.** Devon Francis. A clear, concise, simply written explanation of the art and science of flying. INDIANAPOLIS, BOBBS-MERRILL, 1945.

**GUIDE TO MODEL AIRCRAFT.** David C. Cooke. For beginner and intermediate model builders. N. Y., MC BRIDE, 1945.

**PLASTICS: WHAT EVERYONE SHOULD KNOW.** Bernard Wolfe. Tells how plastics are made, what they are made of, what can be and is being done with them, who makes them, why hard to get and prospects for the plastic future. INDIANAPOLIS, BOBBS-MERRILL, 1945.

**PRINCIPLES OF INDUSTRIAL PROCESS CONTROL.** Donald P. Eckman. Description and explanation of fundamental principles which apply to the operation of a process under automatic control. N. Y., WILEY, 1945.

**PRINCIPLES OF RADIO FOR OPERATORS.** Ralph Atherton. A training manual and handbook for radio operators, maintenance men and those constructing equipment for sending, receiving and testing. N. Y., MACMILLAN, 1945.

These books are available to AAF personnel through the AAF Technical Library Service, which provides for technical libraries at all major installations. For a complete list of books so available, see **TECHNICAL PUBLICATIONS FOR ARMY AIR FORCES TECHNICAL LIBRARIES**, Book List No. 2, March 1945 and supplements thereto. These lists are compiled by the Technical Library Section, Personnel Services Division, Headquarters AAF. Personal copies of these books may be obtained from the publishers or retail bookstores.

# +++++ CROSS COUNTRY +++++

**Army Flier,** Arnold and Eaker. Military aviation as a career.

**Seven Came Through,** Rickenbacker. Adrift in the Pacific.

**Fighters Up,** Friedheim, Taylor and Gordon. American fighter pilots in the battle of Europe.

**Winged Victory,** Hart. The AAF play. **First of the Many,** McCrary, Scherman. Action with the 8th Air Force.

**Target Germany,** The 8th Bomber Command's first year over Europe.

**War Below Zero,** Balchen, Ford, La Forge. Battle for Greenland.

**Bombs Away,** Steinbeck. Story of a bomber team.

**Air Power,** Editors of LOOK. A picture book of the AAF. ☆

## Bulldozer Training

The school which trained many of the aviation engineers who scraped giant airfields out of coral reefs and jungle hillsides to bring our war planes closer to the enemy is still going strong. On the wooded slopes of western Washington, Geiger Field, home of the aviation engineers, is continuing its program of training men to operate and service earth-moving equipment.

Back of the unforgettable records of landing strip construction during the tough days of Saipan, Okinawa and the Philippines is the school's slogan, "nothing to it if you know how." Since activation of the AAF school at Geiger Field in December 1942, the engineer unit has turned out over 5,000 heavy equipment operators and repairmen. Graduates served as combat engineers in every overseas theater. Now new trainees pass through the school at six-week intervals, bound for depleted overseas units.

Moving mountains and pouring concrete are but a part of the AAF Engineers School program. This 4th Air Force unit also has classes scheduled for depot companies to operate large overseas centers, for utilities companies which will be in charge of base electrical and plumbing systems, and for heavy weapons sections to defend aviation engineer battalions.

Part of the training at Geiger Field is a ten-mile strip of torture they call the "little Burma Road." Winding through the mountains, this course offers trainee drivers every thrill the real thing had to offer. It teaches the boys who push the big trucks on the roads overseas the little details of how to stay alive. ☆

## "Hump" Mission Accomplished

Leaving only 24 ATC planes to carry out operations over India and Burma, the legions of air transports which conquered the "Hump" to make aerial history have made a mass exodus back to the United States.

ATC's India-China Division is no more. (See page 8) On March 1, ICD became a part of the North African Division with headquarters at Casablanca. Left behind are the 1304th India Wing Base, headquarters Barrackpore, and six small

operating bases scattered throughout India and Southeast Asia.

Only four C-54s remain in India. The rest were flown back to Westover Field, Mass., and Hamilton Field, Calif., to be based in the States. Some will find their way back to India flying the Globester Route, or as part of the Contract-Carrier New York, London, Paris, Karachi, Delhi and Calcutta run.

Of the ships still remaining in India this spring, besides the four C-54s, were 18 C-47s, one L-5 for search and rescue work and a B-25 used for DDT spraying. ☆

## Higher Education

Unique in the annals of the AAF Technical Training Command is a training program for squadron commanders and first sergeants, established at Boca Raton Army Air Field, Fla. in March. The course for squadron commanders deals with all phases of squadron administration and management. Only captains, majors, or lieutenant colonels who are squadron commanders or prospective COs are eligible for the course. Officers must have signified intention for indefinite active duty or applied for a regular army commission. The course for first sergeants is designed to teach them the know-how of their job. First sergeants or master and technical sergeants who are prospective first sergeants are eligible, provided they have enlisted in the regular army or signed for at least another year of service. Both classes accommodate 60 students and new classes start every two weeks. ☆

## AAF Pics For Sale

Unclassified AAF official photographic prints are now available to civilian applicants through the AAF Photographic Library. Pictorial prints of the types and subjects listed in par 3a, AAF Regulation 95-6, 19 May 1945 may be procured in 8x10 single weight glossy finish for 50 cents each and double weight matte finish for 55 cents each. Aerial photographic prints of areas within the continental limits of the United States may be procured in the same finishes and in sizes 7x9, 10x10 and 9x18. Quantities available range from 1 print to over 1,000. Aerial photographic indexes, plot maps and mosaic copies will be furnished in 20x24 sizes. Only negatives made for official purposes will be used and no deviation as to size or types specified above will be made. The War Department announces that it has no authority to waive the privacy rights of individuals shown in the official photographs and that no exclusive rights may be claimed by any individual who purchases the photographs. Prints will not be used to imply or show that the War Department indorses any product or project nor can they be used in competition with commercial photography. All reproductions will bear credit line "U.S. AAF Photo." Payment must be made by United States postal money order or certified check payable to the Treasurer of the United States. ☆



## AFA Membership Plans

The Air Force Association, headed by Gen. James H. Doolittle, has begun a nation-wide solicitation of members. Its program envisions the formation of "squads" in localities and "wings" in states. Rosters are open to all men and women who served in the Army Air Forces. All personnel on active duty are eligible to become associate members entitled to all privileges of the regular AAF veteran membership except the right to vote and hold office.

The AFA is fostered by national leaders as a means of keeping Air Force veterans together and, in the words of General Doolittle, "to see that the Air Forces get a fair and earned position in the national defense program."

Emphasis is being placed on securing women members who served with the AAF in many capacities overseas and in the Zone of the Interior. Incidentally, the first Wac to sign as an associate member of AFA was Maj. Sally Bagby of St. Louis, aide-de-camp to Gen. Carl Spaatz, commander of the AAF. Major Bagby, who enlisted in the WAC in July, 1942 and was commissioned three months later, became secretary to General Spaatz in April, 1943 when he was in command of Northwestern African Air Forces, and has remained on his staff since that time.

Col. Willis S. Fitch, executive director, in charge of National Headquarters at 1603 K Street, N. W., Washington, D. C., stated recently that AAF veterans in all parts of the United States had evinced interest in the AFA. The membership committee of which Corey Ford, the author is chairman soon will an-

nounce detailed plans for solicitation of members. Col. Phil Cochran is a member of Ford's committee.

AFA's specially designed, red, white and blue insignia has been approved by the Association's directors headed by Maj. Gen. Edward P. Curtis, former S/Sgt. Meryll Frost and former Lt. Col. Thomas G. Lanphier, Jr.

In New York, Mrs. Doolittle took over for her famous husband by launching personally the AFA's membership campaign at the National Aviation Show in April. She was assisted by volunteers of the AWVS and had charge of the AFA booth, greeting Air Force veterans and explaining the purposes of the organization to them.



Maj. Sally Bagby is first woman to join AFA.

Secretary of War Robert Patterson appointed two AFA members to the board which is considering enlisted men's problems in the Army. They are General Doolittle and Sergeant Frost. Although severely burned in an aircraft crash while on a mission to Rome, Sergeant Frost later underwent plastic surgery, returned to Dartmouth in 1945 and became the star quarterback of its football team. ☆

man, radar operator, interceptor technician, or information center technician operator.

Officers who wish to apply may submit applications through channels to the AAF Commanding General, Washington 25, D. C. Enlisted applicants may apply through channels to their commanding general. ☆

## No More KP!

KP, scourge of the AAF, will be eliminated under a program of revised mess management recently announced by the Air Forces. The new program is aimed at increasing conservation and improving all phases of food service through consolidation of messing, supervision and organization.

Contemplating elimination of the old "KP by roster" system, the new policy calls for the establishment of a permanent mess attendant system, where enlisted men will be afforded an opportunity to make an Army career of food service. Men who show marked aptitude in food handling will be offered opportunities to attend schools for the study of cooking, meat cutting, pastry and bread baking, with a further opportunity to become mess sergeants. Some may eventually become mess officers or commissioned "food service supervisors."

The old KP by roster system resulted in many specially and technically trained enlisted men being periodically assigned to duty as mess attendants. During this assignment, they were not available to perform the tasks for which they had been trained. Frequently, as a result of the long hours in a normal stretch of KP duty, men would also be unavailable on the following day as well. ☆

## PARACHUTES LOST

42-68983A	42-58721A	42-244260A
42-77922A	42-59141A	42-537201B
42-59204A	42-58361A	42-148059C
42-384216A	42-59134A	42-1037368C
42-58371A	42-349310A	42-187758D
42-213366A	42-59523A	42-781996D
61111E		

Return to field indicated by letter after number as keyed below

A-4101st AAF Base Unit, Fairfax Field, Kansas City, Kan.  
 B-Perrin Field, Sherman, Texas  
 C-Base Operations Parachute Pool, Atlanta Army Air Base, Atlanta, Ga.  
 D-Personal Equipment Office, Luke Field, Phoenix, Ariz.  
 E-Rosewell Army Air Field, Roswell, N. M.

## Instructors Wanted

Applications are being accepted by AAF Headquarters for Regular Army officers and enlisted men who desire assignment as instructors in the Air National Guard. Personnel assigned as instructors can expect a three-year minimum tour of duty.

Officers must be Regular Army first lieutenants or higher, have 18 months' overseas service since December 7, 1941, be acceptable to the state concerned, and one of the following: active pilot, radar officer, communications officer, fighter interceptor controller, or aircraft warning officer.

Enlisted applicants must be sergeants serving three-year enlistments and one of the following: airplane maintenance technician, administrative specialist, communication chief, camera technician, radar repair-

## HOW SHARP ARE YOU? QUESTIONS

1. How many blades are on the propeller?
2. What number is on the plane?
3. How many men are in the picture?
4. How many of the men have their sleeves rolled up?
5. What type of aircraft is shown?
6. How many wheels are visible?
7. There is no light on the motor scooter. True or False.
8. How many of the men are wearing hats?
9. Are all of the men wearing fatigue clothing?
10. Three guns are shown in the picture. True or False.

ANSWERS ON PAGE 47



# AIRBORNE Symphony

BY IRVING KOLODIN

Former AIR FORCE staff member who is now music critic for the NEW YORK SUN.



**"H**urry up, hurry up, hurry up—and wait."

How many times three-million members of the AAF said these words during the war has yet to be calculated. But they said them often enough, and Sgt. Marc Blitzstein heard them, and said them often enough himself until they began to make music in his mind. This is not surprising, for Blitzstein had been saying things to himself that made music in his mind for years, in such works as "The Cradle Will Rock," which ran on Broadway for many months, and "I've Got the Tune," a CBS Workshop production.

Out of the things he heard and saw in his three years' service in England, the GI composer evolved an "Airborne Symphony" which had its world premiere at the New York City Center of Music and Drama on April 1. Leonard Bernstein conducted it, Orson Welles spoke the narration, Charles Holland, tenor, and Walter Scheff, baritone, helped the Collegiate Chorale sing it. When it was all over, three thousand listeners broke into what The New Yorker described as "one of the noisiest demonstrations of approval for a new work which has been heard here in years."

What this non-commissioned officer but highly commissioned composer brought into being and dedicated to the Eighth Air Force was nothing less than a history of flight. The Negro tenor, Holland, sang jauntily: "Etana jumped on the back of an eagle, in Mesopotamia. Tried to fly in forty-five hundred BC. But he got dizzy; got dizzy and tumbled off; got dizzy, tumbled off, and fell and died." History follows—Phaethon, Icarus, Leonardo, Henson, Cayley, Langley, Chanute, the Wrights. A whole section about the Wrights, naturally, and Kitty Hawk. And then the enemy who was airborne, the war that was airborne, the challenge that came to us by air, and the way it was met, by air.

Out of the grinding blasphemies of Nazi philosopher Rosenberg, Blitzstein made a section called "The Enemy." Set to music that is frenzied and alarming, it echoes the hysteria that swept into our living rooms in those hard-to-recall days when Hitler was a world figure and the broadcasting companies spent millions to distribute the terrible sound of his voice, the bleat of his followers.

Then the roll-call of the Fascist-ruined cities—Guernicia, Warsaw, Manila, Rotterdam, London, Malta, Leningrad. And then "The Ballad of Hurry Up":—

"You know him, the young American?

Fresh from high school, straight out of college  
Green from the office and the farm and the shop  
and the factory?

... Turned flier, turned ground crew, suddenly  
turned Air Force overnight?"

Those of us who thought the excitement and pace and disorderly productive haste of those days could never be re-lived, found that Blitzstein did more than a fair job of preserving it in his own artistic way. There is humor in it

too. A bombardier writes a letter to his girl—a young, white-faced, 19-year-old. "The hand, the eye, the deliberate brow, this veteran now, sits writing a letter home." And then, in a great climax, the "Chorus of Rendezvous"—

"Sound the sound of all the nations

Streaming to the rendezvous

Sound the sound of rally as they rise

Up in the blue."

And with Victory, the amplified voice of the narrator pleads against the jubilation of the chorus, there is a threat. "Not without warning to be airborne. Not without grief. Not without warning."

Blitzstein says that credit for stimulation of his work should go to Col. Bierne Lay, who visualized it as something to be done on a grand scale by Army personnel, AAF personnel particularly, 8th Air Force personnel specifically. Lt. Gen. Ira Eaker was keenly interested in its progress when he was CG of the Eighth, and those that followed were reminded of its coming into being. Jock Whitney and Tex McCrary, when they were public relations officers in England, did the reminding. The progress of the war brought conflicting assignments to Blitzstein, however—musical direction of ABSIE for one, assembling of music for the film, "The True Glory," for another—and the war finished before the symphony.

That term should not discourage the uninitiated, for it is mainly a description of the large orchestra and chorus that are used, not a likening of its style to the classic Brahms or Tchaikovsky. Blitzstein's best writing has always been done in a manner quite his own which has considerable popular and folk-music character. A neat touch in "The Ballad of Hurry-Up" is a close-harmony quartet for barracks-room background; and the letter of the bombardier to his girl is a take-off of a Roy Rogers cowboy ballad, with a guitar-styled accompaniment coming unabashedly from the symphonic strings! But when the text is serious and meaningful, Blitzstein works away with all the resources of his craft.

In the encyclopedias you can find out that Blitzstein was born in Philadelphia 41 years ago, played solo piano with Stokowski when he was 15, studied with such eminent names in the composing field as Boulanger and Schoenberg, produced several paragraphs-worth of sonatas, quartets and concerts before finding a style for himself and the Mercury Theatre of Orson Welles in the mid-thirties.

Nothing there about Billy Mitchell or Herman Goering or "60,000 planes."

But when they came into his life and he buckled on his GI armor and went forth to do battle the best way he could—if only with pencil and music paper—something happened for which those who follow American music are thoroughly grateful. Blitzstein became a part of the AAF, and the AAF became a part of Blitzstein. Witness the "Airborne Symphony." ☆



# technique

Development, Maintenance and Supply of Aircraft and Equipment





## Air-Borne Cinema

An important step toward relieving monotony on long flights has been made by personnel of Hamilton Field, Calif. Any type film, from a full-length feature to a singing "short," can be shown to airplane passengers by a new self-contained projection unit developed by ATC and the Army Signal Corps. In addition, the unit provides radio broadcast entertainment, musical reproduction by sound on film and a built-in microphone to facilitate briefing of passengers in flight.

The development is considered one of the most advanced among aerial movie projects. Programs may be heard by passengers either through newly designed loudspeakers audible throughout the airplane, or through individual headsets. The latter make for a quiet cabin and individual choice of listening. Also, speakers built into headrests with individual volume control can be supplied by modification. Pictures, either in color or black and white, are shown by means of a specially designed, 16-millimeter sound motion picture projector. Using a reflex optical system, the instrument presents pictures on a lucite screen 38½ inches by 29 inches. The image is big enough to be seen clearly and without distortion anywhere in the largest airplane. Up to three hours of continuous entertainment can be provided by using large reels. Civilian use of a similar device on commercial aircraft and on trains is a possibility of the future.

Advantages of the self-contained unit over conventional projectors are three-fold: the weight of the projector is forward in the airplane instead of in the rear; passengers or crew members can move around in the airplane without interfering with the screen; operation is much more simple. The present installation is portable, weighs 500 pounds, but could be reduced to less than 100 pounds, will cost under \$750 and will fit any type of aircraft, whether ambulance, bucket-seat or de luxe lounge.

The device was conceived as a result of observations by Sgt. Mart J. Soukup, ATC Flight Traffic Clerk from Burlingame, Calif., during several years of flight over the vast Pacific routes. He noted that wounded being returned from forward areas had no entertainment while confined to their litters on monotonous over-water flights sometimes lasting 12 hours or more. ATC backed development of the unit to provide the needed entertainment.

Sergeant Soukup and 1st Lt. Gerhard

F. Jessen of San Francisco, In-Flight Service Officer for the 1503rd AAFBU, obtained Pacific Division consent to experiment with an in-flight entertainment unit in cooperation with the Signal Corps. Soukup acted as liaison between the two agencies. The present set is the work of the 9th Service Command's Signal Office, Radio Branch, at the Presidio in San Francisco.

The following engineering data on the unit may be of interest: Electric power source on C-54s is 28 volts DC and total available power is 400 amperes. The power drain of the present equipment is approximately 100 amperes and power invertors are included in the unit to transfer 28 volts DC into 110 AC. However, further modification will eliminate the need for conversion, cut the power drain to 50 amperes and the weight of the unit by 175 pounds. With installation of the reflex screen in the forward cabin bulkhead, the sound equipment behind the screen would operate directly from the airplane's DC power source. ☆

## Paracutin Mission

Recent tests conducted at the base of the Mexican volcano Paracutin have proved that even at two miles above sea level and under extreme conditions of heat, volcanic ash and humidity, the Army's Sikorsky R-6A helicopter will fly successfully and do jobs in war and peace that conventional airplanes cannot do. Since the R-6A was built for low altitude operation and under fairly ideal operating conditions, little was known about how it would perform under adverse conditions.

ATSC engineers, asked to augment the investigations being conducted by civilian geologists into the activities of the new volcano Paracutin, utilized the mission to obtain accelerated service data on the new Sikorsky R-6A, then just beginning its program.

As many preparations as possible were made in advance. It was determined that the R-6A helicopter would go through the door of a C-47 with one inch to spare. One C-47 was then loaded with the disassembled helicopter

**Hovering over** the Mexican volcano, Paracutin, an Army Sikorsky R-6A Helicopter carried expert volcanologists to permit them to study results of a recent eruption. These tests proved the versatility of the helicopter as compared to more conventional type aircraft. Despite convection currents and turbulent air, the R-6A functioned admirably as a stable platform for studying the volcano and the unusual lava formations.





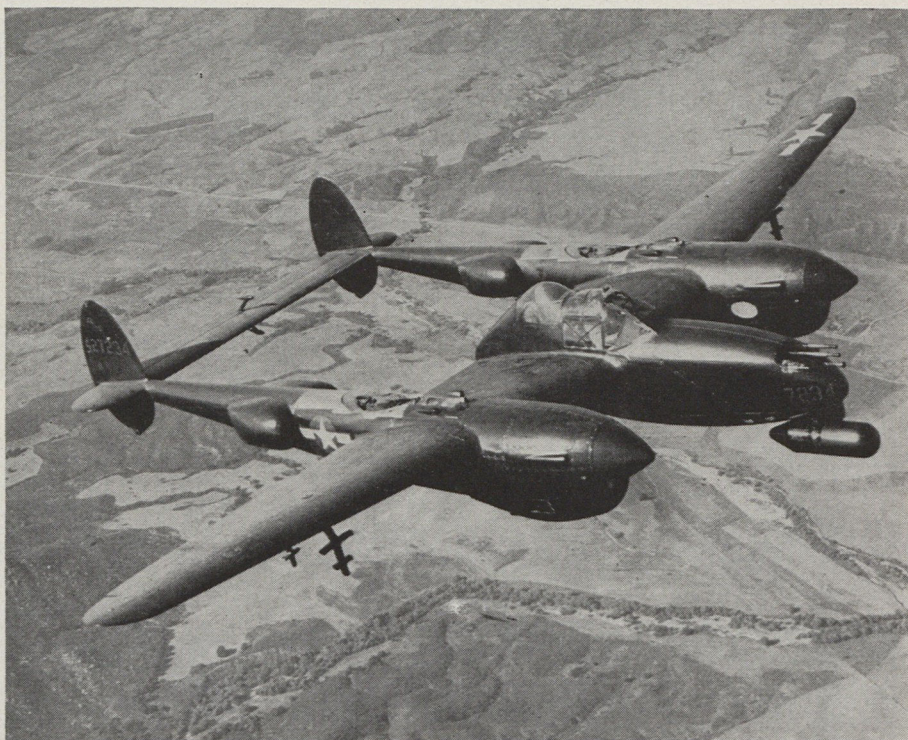
and another with supplies, baggage and spare parts as well as the personnel necessary for successful completion of the mission. The Mexican Air Force made available its new airfield at Guadalajara as a permanent rear base. An advance base was set up near the foot of the volcano from which all flights and tests were run.

Hovering over the volcano and its lava beds, often within three hundred feet of its rim, the R-6A carried American and Mexican volcanologists on flights that allowed prompt observation and study of new activity that would have ceased before the area could have been reached on foot. Several landings were made near such newly active areas enabling the geologists to make in a few minutes inspections which otherwise would have required hours of climbing. Around the jagged and sometimes still hot lava beds, the convection currents were strong and the air was turbulent and heavily laden with volcanic ash. Despite these conditions, the R-6A functioned admirably as a stable platform for studying the core of the volcano and the unusual lava flow formations invisible from the ground.

Much electrical activity was discovered in the erupted dust and vapor. Data gathered from personal observations and by recording instruments and cameras is expected to lead to greater accuracy in predicting the position and movement of thunder showers and other information which may provide additional safety factors in flight operations. Valuable data were secured concerning damage caused the engine, universal joint and rotor heads by the ash laden atmosphere and the effects of the hot air currents and the high temperatures on the lubricating systems, as well as operational techniques necessary at high altitudes and in extremely turbulent air.

Seventy-five flights were made over the crater and the lava-covered countryside without the loss of a single minute of flying time due to malfunction of the airplane. Some of these flights were made at night to enable the photographers to get some night-time shots showing the flow of lava and activity in the crater's core.

Requests are already piling up from such organizations as the Smithsonian Institute, National Museum at Washington, Harvard, University of Texas, Geophysical Laboratory of Carnegie National Research Council and many others for the motion picture film of the Paracutin expedition. ☆



**Radar equipped P-38 Lightning** served during closing weeks of Pacific war as night fighter. This P-38M was 50 mph faster than previous night fighters—carried four .50 caliber machine guns and one 20 mm cannon in the nose, 5 inch rockets under wings.

## The Avro Tudor II

Great Britain's newest and largest airliner, the Avro Tudor II, embodies many combat tested features of construction and may be used as a passenger or cargo transport. Four Rolls Royce Merlin engines rated at 1,770 hp enable the Avro Tudor II to achieve cruising speeds of 200 to 250 mph. These engines have been specially developed from the Merlin which powered every fighter that took part in the Battle of Britain and which was installed later in many famous fighters and bombers, including the P-51.

At a gross weight of 34 tons, the plane is airborne after a run of less than half a mile. Flight safety is guaranteed with 3-engine performance which can take the aircraft to a height of 23,400 feet. Fuel tanks hold 2,420 gallons for normal operations, giving a maximum range of 2,950 miles with a payload of 7,150 pounds. Two extra wing tanks increase the capacity to 3,300 gallons, producing a maximum range of 4,100 miles. The wing span of Britain's newest airliner is 120 feet. It measures 105 feet 7 inches from nose to tail and has an overall height of 24 feet 3 inches.

Tudor IIs will be used on all the main British long-distance air services

both in the empire and on the UK-South America route. ☆

## Faster Night Fighter

Airmen all over the world know the P-38, the AAF's versatile fighter, but how many have seen Lockheed's Night Lightning? A radar-equipped modification of the old faithful P-38, the night fighter had a 425 mph speed which made it about 50 mph faster than earlier night fighters. The radar operator's cockpit, slightly raised behind the pilot's, and detection equipment housed in a streamlined carrier resembling a small auxiliary fuel tank under the aircraft's nose, were the only distinguishing features of the Black Hornet. It was designated the P-38M and was used during the closing weeks of the Pacific war. Four .50 caliber machine guns and one 20 mm cannon were mounted in the nose. Five-inch rockets were carried on inverted "Christmas Tree" cluster launchers underneath each wing. Jettison-type fuel tanks gave it operational range of 1,700 miles, like its day-fighter brother. Radar detection, together with the fire power from a salvo of 10 rockets make the Night Lightning lethal against ground or sea targets, as well as against enemy aerial night prowlers. ☆





## Push-Button Flight

Fully automatic flight—as simple to operate as radio push-button tuning—is the AAF's newest achievement.

Through development by AMC engineers of a new control unit called the Automatic Flight Controller, pressure of a single button will cause an equipped plane set in take-off position on a runway to move into the air, climb to proper altitude, find and fly pre-selected directional beams, and land at a predetermined field hundreds of miles away.

First installed in a C-54 Skymaster, the Automatic Flight Controller was originally conceived as a means to overcome weather conditions which normally would ground all planes.

The Controller, used in conjunction with the A-12 automatic pilot, is a coordinated system of aircraft controls, the function of which can be pre-selected to produce a point-to-point flight including automatic take-off and landing. It is the pre-selection feature which differentiates the Automatic Flight Controller from previously developed systems. Unlike flights directed by remote control from the ground or a "mother" ship, "push-button" flight is completely controlled by a system of automatic devices which

operate in the airplane without any outside control.

The nerve center, or "brain," of the Automatic Flight Controller is known as the "master sequence selector." To the master sequence selector are fed the variable factors such as direction, distance and altitude. The master sequence selector then delivers impulses motivating in proper sequence the mechanical functions of the airplane.

Preparation of the aircraft for fully automatic flight consists simply of placing it in position on the selected runway heading, with brakes locked and engines idle. At this stage the push of a button, the only manual operation performed, activates the Automatic Flight Controller. This unit then takes over all direction and operation of the aircraft. Take-off procedure is initiated by automatic move up of throttle, the brakes are unlocked after eight seconds and the aircraft takes off.

At 800 feet the pressure "stat" operates to reverse the throttle, wheels are retracted and flaps raised automatically thus causing the aircraft to climb to cruising altitude. The pressure "stat" again sets in motion and throttle is reversed for cruise speed. Once in this position a magnetic heading control cuts in and the aircraft is guided on its

proper course while an air log registers mileage. Automatic controls also govern altitude of the plane.

A depression of the air log is the auto-pilot's signal that the aircraft has reached its destination, and it "homes" on the selected radio compass station. This homing procedure is an intricate process performed by the "brain" as follows:

Passing over the cone of silence marker the throttle is automatically cut back; the pilot, controlled by a compass locator station at an outer marker of the landing field, feeds a down signal into the elevator control circuit, and the aircraft homes on an outer marker losing altitude in an inbound position. When altitude has been lost to a point of 880 feet, the pressure "stat" initiates operation to lower landing gear and flaps, cutting back throttle and cutting in automatic altitude control. When the aircraft has passed the outer beacon marker, elevator control is operated by glide path signal. Upon reaching the landing strip, the throttle automatically cuts back and brakes are applied after an interval of three seconds. Ground direction is controlled by a differential braking system which operates until the aircraft has come to a full stop. ☆



## Even in Zero-Zero Visibility

Research has now brought all-weather flight to the reality stage. At least once every six hours every day, crews of Wright Field's all-weather flying division—meteorologists, engineers and specially-trained pilots—go up. They fly at once into the worst conditions with-in accessible distance observing effects of the weather on plane performance. This schedule has continued unbroken for more than three months, with the planes taking off and landing safely regardless of ceiling or other weather factors.

Major consideration of the All-Weather Flying Division has been instrument panel reassembly for more efficient operation. This is performed in cooperation with Wright Field's other developmental laboratories. Work is under way on the modification of a C-47 cockpit to test an entirely different instrument and control board assembly. Basis for the change is the fact that instruments were originally grouped for reading and operation during normal clear-weather flying and are not as satisfactorily applicable during night and instrument flying and blind approaches. The result is a complete turnabout. Under the new arrangement the instruments with which pilots fly during other than normal conditions are grouped in close proximity to the basic instruments, so that the full picture can be seen immediately.

These changes, and others still under security blackout, indicate the beginning of an era in which scheduled flights will no longer be subject to the vagaries of weather. ☆

## Do Jets Burn Kerosene?

Contrary to popular opinion, ordinary household kerosene and the fuel used in jet planes (Army designation JP-1) are not the same thing. Rigorous specifications, approved by both Army and Navy, have been drawn up for jet propulsion fuel. Although these standards will generally meet all requirements for household kerosene, the ordinary variety of stove fuel will seldom meet requirements for JP-1.

Kerosene for ordinary domestic use must meet only two basic requirements: combustion with a minimum amount of smoking, and a high enough flash point to reduce explosion hazard. On the other hand, fuel for use in our jet planes has definite limitations for freezing point, corrosion, residue, specific gravity, gum, distillation, range and viscosity, assuring satisfactory operation of jet engines under all conditions. ☆

## German Ribbon Parachute

More about the unusual German Kotelezky high-speed parachute has been disclosed by Wright Field's Personal Equipment Laboratory. The chute, originally issued to pilots flying ME-262 jet-propelled fighters, differs radically from conventional types in that its lines do not cross the top of the canopy. The lifting surface of the canopy is comprised of 144 ribbons,  $2\frac{1}{8}$  inches wide by approximately 32 feet long, which form a lattice work very dense in the region of the vent and progressively less so as the skirt band is approached. Ten concentric circular bands of  $\frac{5}{8}$  inch-wide tape, which provide support for the ribbons, are located at intersecting points of the ribbons and run in decreasing diameter from the skirt to the vent.

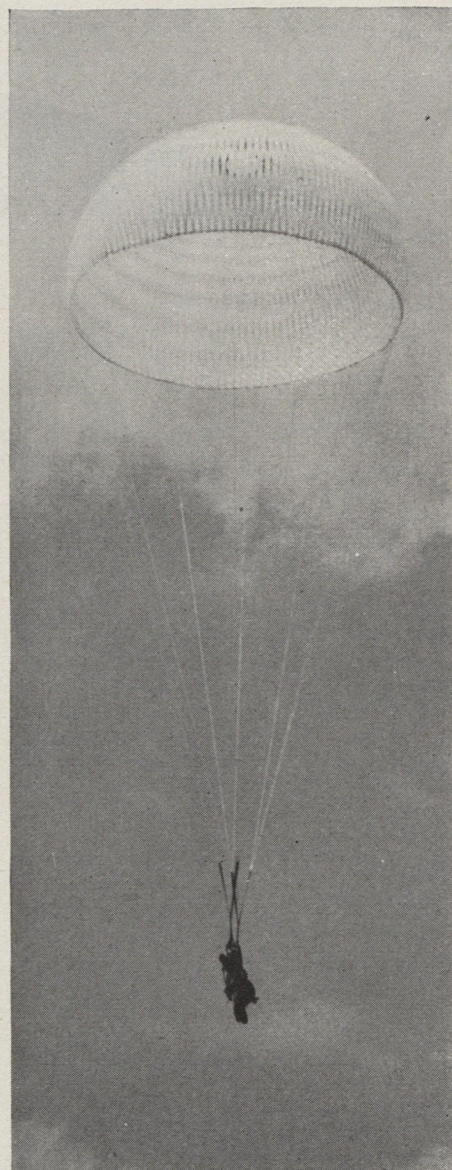
Twelve double-length lines, attached by their center portion to the canopy skirt band in 288 places, are used to suspend the load. Six live jumps were made into water from aircraft flying at a maximum indicated air speed of 150 mph at altitudes up to 8,000 feet. Under these conditions the canopy was found to have a slow, steady deceleration during inflation, totally eliminating the opening shock experienced with standard canopies. Also, the parachute descended with no noticeable oscillation, impressive since oscillation is one of the characteristics of the standard parachute canopy and a major cause of landing injuries.

The water tests indicate the rate of descent of the ribbon chute—hemispherically shaped, with a diameter of 20 feet 4 inches—to be approximately equal to the standard 24 feet diameter service chute, which has an inflated diameter of approximately 16 feet.

German technical sources indicate that, although the chute saw some combat service, it was neither extensively used nor exhaustively tested and further development will probably be required. One improvement will probably be a change-over from silk to nylon, which is domestically produced and not affected by mildew. ☆

## "Connie" Gains Weight

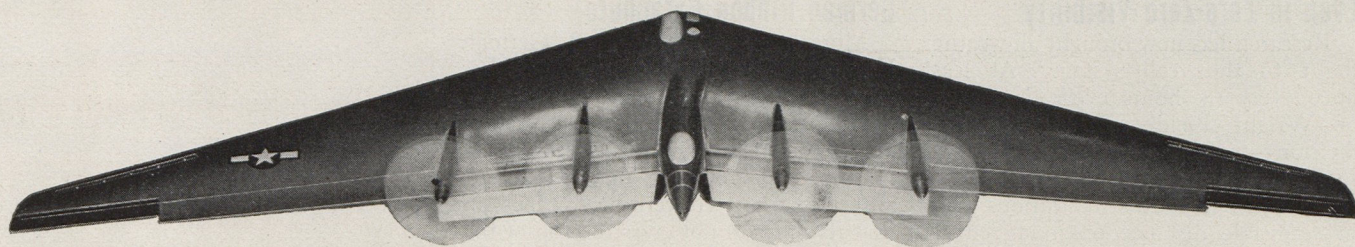
A spectacular increase of four tons in the payload of the Lockheed Constellation for flights up to 1,500 miles results from development of the Speedpak, an all-metal, streamlined cargo container that fits snugly to the underside of the fuselage. It takes only two minutes to lower the Speedpak to convenient loading height or raise it into position for flight.



Preliminary test flights show that the 300 mph cruising speed of the Constellation is slowed only 10 mph by the Speedpak installation, with no impairment of flight characteristics.

Developmental work began on the Speedpak when Constellation performance tests demonstrated the plane's ability to maintain its safety factor and fast speeds at gross weights considerably exceeding those for which it was designed. This meant that more payload could be added, but finding space for it was a problem. The Constellation's trim lines left no unused space for passengers or cargo in the standard fuselage, so the Speedpak was designed to nestle underneath the Constellation between the wings. The weight carried by this novel attachment exceeds by one ton the total payload of standard two-engine transports. ☆





### Flying Wing Data

Unique in design, the Northrop XB-35, or "Flying Wing," will soon reach flight test stage. As its nickname denotes, it is nearly all wing, swept back to lower drag characteristics. In flight it will resemble a wide-spread V, the wing forming an obtuse angle, the vertex of which is the nose of the aircraft.

Overall length from the nose to the end of a large, bullet-shaped nacelle protruding beyond the center of the trailing edge is a little more than 48 feet, but from tip to tip, it measures about 172 feet. When compared to the 141-foot wing span of the B-29, the size of the XB-35 can be readily appreciated.

The thickest part of the wing, just forward of its center, is about seven feet. The wing increases in taper rapidly from the leading edge, which is about four feet thick in the nose area, to its full thickness at a point about one-third of the way back toward the trailing edge. At the latter point it assumes a near level appearance for a short distance and then, with a gradual receding taper, comes to a point at the trailing edge. Laterally, the wing tapers off gradually to the wing tips.

The aircraft will accommodate a crew of 15, of whom six will serve as a relief crew, occupying quarters in the thick wing center. Observation by the crew is done easily through windows in the leading edge. The cabin is pressurized for high-altitude flying. Oil and fuel lines are self sealing.

The Flying Wing will be propelled by four Pratt & Whitney R-4360 pusher type engines driving contra-rotating propellers which have a reversible pitch for braking purposes. It has a retractable tricycle landing gear with dual main wheels and a single nose wheel.

One of the many revolutionary features is the alternating current electric system, a space-saver and much lighter in weight. All conventional type aircraft until now have been fitted out with direct current electrical systems.

It has no empennage. The problem of locating the vertical stabilizer was solved by placing on the trailing edge of each wing near the tip a split rudder similar to a dive bombing flap. When the pilot of an ordinary aircraft desires to turn, he moves the rudder and aileron; in the Flying Wing he will cause the jaw-like flaps to open to an angle which cause sufficient drag to pull the aircraft to the desired position. This split-type rudder, when closed, follows the contour of the trailing edge of the wing to a very thin edge at the tip. Elevators were combined with the ailerons and are called "elevons." These are located on the trailing edge of both wings just inboard of the split rudder to do the work of elevators and the ailerons on the conventional type aircraft. Despite these unique changes, the Flying Wing operates from the control steering wheel much the same as an ordinary aircraft. However, the unconventional design requires considerably more pressure on the controls by the pilot. To offset this, the controls are installed with hydraulic boosters and require light pressure to control the wing. An emergency electrical booster system has been added in case the hydraulic boosters fail, thereby assuring control of the plane at all times.

As a safeguard against the pilot moving the control stick inadvertently at very high speeds which might cause the control surfaces to be torn off, a force feed bellows has been installed. The bellows is operated by air-impact; that is, the faster the speed, the greater the impact. The bellows, through this

impact, causes the controls to react only to greater pressure on the wheel thus simulating forces the pilot experiences in a conventional aircraft at similar speeds. Unique qualities of the Flying Wing are: its swept-back design reducing air-drag to a minimum, and elimination of the empennage, enhancing ability of the plane to reduce air-impact at very high speeds. ☆

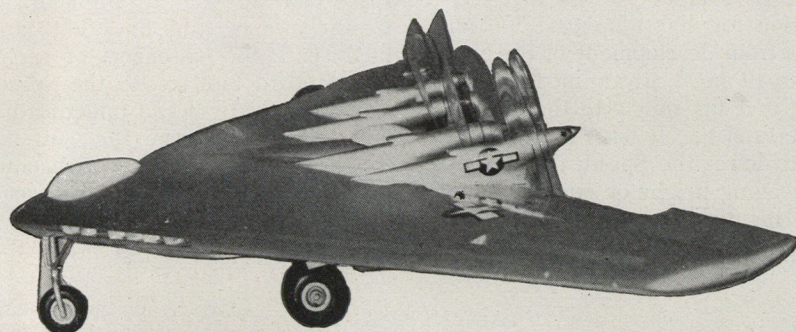
### Super-Superfortress

A new bomber to be known as the B-50 is currently under construction by Boeing Aircraft at Seattle, Wash. In reality it is a counterpart to the famous B-29 with increased power and improved flight performance, officials of the Air Materiel Command, Wright Field, report. Experimentally, the aircraft is known as the XB-44. Tests were made under the supervision of Air Materiel Command and Pratt & Whitney, East Hartford, Conn.

The B-50 is powered by four R-4360 Pratt & Whitney radial engines totaling 12,000 hp. The increase in horsepower over the B-29 comes from a change in the engine installation, providing a marked improvement in the take-off, rate of climb and speed of aircraft. Jet exhaust stacks also give the aircraft an increase in speed.

Nacelles have been designed to permit a very rapid change of engines. The nacelle contains the engine, supercharger, induction system, oil system, engine and propellant controls. This power unit can be detached quickly from the firewall. Formerly it required six men eight hours to change one engine on the B-29, but now the same number of men can do the job in one-half hour.

Propellers have been replaced by four-bladed Curtiss-Electric propellers with reversible pitch for braking purposes and a feature permitting the automatic synchronization of all four of the propellers. Although some more recent models of bomber aircraft have had this installation, the XB-44 is experimentally using it for tests to improve it. The main reason for synchronization of propellers is the reduction of noise and vibration while the aircraft is in flight. ☆

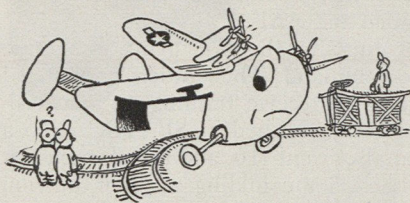




# tech topics . . .

## about aircraft and equipment

**Heavy payload gliders** are now on the schedule. One is a large high-wing affair capable of carrying 8,000 pounds useful load. Another will have cargo-carrying capacity of 16,000 pounds for transporting heavy combat and engineering equipment. Other glider developments include a new and tougher tow rope capable of withstanding a pull of 34,000 pounds, an electrically controlled tow-line release, an automatic towing reel.

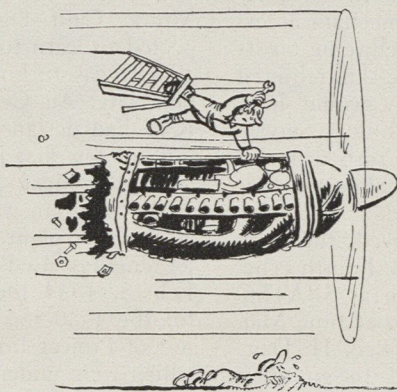


**Redesign of major parts** for the Pratt & Whitney R-4360, the largest air-cooled type engine now under development, will permit increased take-off and military ratings. Anticipated changes are expected to boost the horsepower above the 3,650 mark. . . . The engine may also use direct cylinder injection instead of the carburetion method of obtaining fuel now in use. . . . Depending on the success of tests with small gas turbines now being built for auxiliary power plants, engineers are planning to undertake a small gas turbine engine for trainer aircraft. This power plant, if and when it is completed, will be the answer to the light plane manufacturers who are seeking jet propulsion for their models. . . . Application of vertical crankshafts to some of our higher-horsepower rated engines now under experimental development may also give a boost to rotary wing aircraft. . . . Meanwhile, several design changes in the P-80's jet engine indicate a thrust-power increase.

**Ceramics as solid bodies** and as coatings for materials offer one of the most promising means of reducing the use of high alloy materials and of permitting the use of increased temperatures, and also increasing life of jet turbine engine parts. . . . Work also has been initiated on the cooling of turbine blades by oil circulation. . . . Power boosts for assisted take-off indicate that 4,000, 6,000 and even 10,000 pound-thrust rockets will soon be available from liquid-propellant rockets. . . . Development of high frequency, low-tension ignition systems looms for application to reciprocating engines and particularly to jet and turbine engines. . . . New improvements in gear reduction methods and clutches will enable pro-

pellers to be located much farther from their prime-movers than in present aircraft. . . .

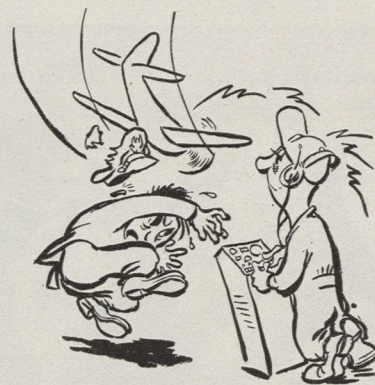
**Propellers** are under consideration for speeds up to 800, 1,000 and 1,500 miles per hour and engineering data indicate that such speeds are possible without decreasing the propeller's efficiency appreciably. The trend in prop development is toward larger propellers, swept-back blade tips, thin airfoils, more blades. One proposed design will have full-feathering, quick-reversing mechanism and rapid speed pitch changer for use with future power plants rated up to 8,000 horsepower. . . . Helicopter rotor blades, considered a propeller development, are to be tested with hot air, electric heat and fluids for de-icing the blades to make the helicopter an all-weather flying machine.



**Many of the unknowns** and potentialities of rotary wing aircraft have been eliminated, says a current report. It describes helicopters of all sizes suitable for courier service, photography, evacuation, fire control and many other uses. Current developments and planned improvements for the helicopter include: application of superchargers to small engines, the development of metal rotor blades, improved airfoil sections for rotors, new cooling methods, all of which will produce efficient, durable and high-performing helicopters. One such design for liaison work under consideration will be able to fly at altitudes about 15,000 feet, and may have a top speed greater than any existing rotor craft. . . . A large two-rotor helicopter is being built primarily as a utility cargo aircraft, which has a gross weight twice that of present machines. Large helicopters are being considered which may lift payloads in excess of 10,000 pounds for short range operation. . . . Preliminary studies are being made to determine the potentialities of jet propulsion in helicopters.

**Antennas** on top of the fuselage of C-82s at Wright Field have been completely re-worked by the Electronic Subdivision to permit personnel to bail out safely during flight. . . . A YR-5D aircraft has been equipped with an interphone, so that a crew member lowered below the plane on a cable can talk with the pilot. . . . Engineers of the Electronic Subdivision are progressing satisfactorily in their work to perfect a completely noise-free B-29. . . . Tests are under way on high-powered loudspeaker equipment for voice communication between aircraft and ground. . . . Under consideration is a dynamotor which was originally developed for train service, but which may prove applicable to aircraft equipment. The dynamotor is believed to afford a regulation of 5 per cent or better of an input voltage range of 22 to 32 volts DC. The regulation is obtained without use of external voltage regulators, resulting in a lightweight and simpler unit. . . . Also discussed is the development of sealed dynamotors. . . . B-17 flight tests at high altitudes indicate that recently-developed interphones, headsets in helmets, and microphones in oxygen masks will operate satisfactorily under those conditions.

**Pilotless aircraft** under experimental development include many ground-to-ground, air-to-ground, air-to-air, and ground-to-air types. Some will have sub-sonic speeds.



Others it is hoped will reach speeds surpassing anything the Germans had, including the treacherous V-2 series. . . . Air-to-air missiles, launched from large planes, will become virtual high-flying, high-speed artillery pieces, rendering obsolete any aircraft cannon developments that were perfected during the late war. . . . This program calls for use of ram jets, pulse jets and rockets.



# The Disturbin' Turbine

With jet turbines an engine change is easy but maintenance is unconventional and specialized

**C**hief, they tell me all you got to do on this jet job to change an engine is undo a half dozen bolts, and you got it made!" a Mech of the 1st Fighter Group remarked one day last spring when he looked over the P-80 Shooting Star at the Group's base near the Adriatic shore at Lake Lesina, Italy. Admiringly, the crew chiefs scrutinized the power plant of the sleek, gray fighter which had been brought to Italy for tests under combat conditions.

"Yes, that's all. The entire jet unit really comes out," the chiefs were told by a Wright Field attendant of the Shooting Star. "Another one is bolted in. No more intricate, backbreaking tinkering to make an engine change!"

In their admiration of the P-80 none of the group thought to ask what becomes of the turbine which is removed, how it is put back into condition, or how it is overhauled. If any of the line chiefs had, they would have been surprised to learn that jet turbine maintenance requires the skill and precision of top-flight mechanical experts, and that in many ways the overhaul technique on its power unit is a far more exacting task than the skill required to restore a reciprocating engine. Also they would have been interested to know that the Air Technical Service Command had set up back in the States a jet turbine maintenance project nearly 15 months before the Shooting Star appeared in Italy.

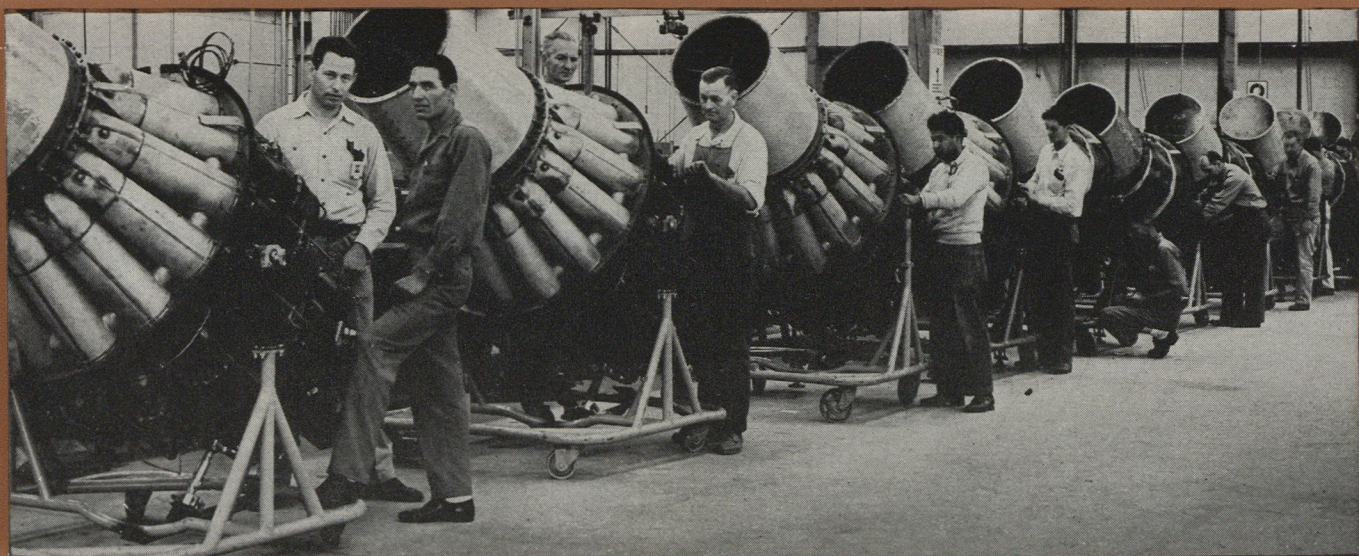
With the cloak of war time secrecy removed, the story of jet turbine maintenance can now be related. Fourth echelon jet engine maintenance had its inception at SBATSC base in California in December of 1943. At that time Maj. Fred H. Junk, then special assistant to Col. Leo. H. Dawson, Chief of Maintenance, was designated to go on a

secret mission to General Electric Company's West Lynn plant. Colonel Dawson had known Major Junk since World War I. Formerly a racing driver, winner of the first Pikes Peak Mountain Drive, engineering officer and pilot in World War I, the Major had been active in internal combustion engineering and testing work since 1914. He organized Allison Service Schools for Army personnel in Indianapolis in 1940, and a year later established two of these schools for the RAF in England during the Battle of Britain. In 1942 he joined the AAF.

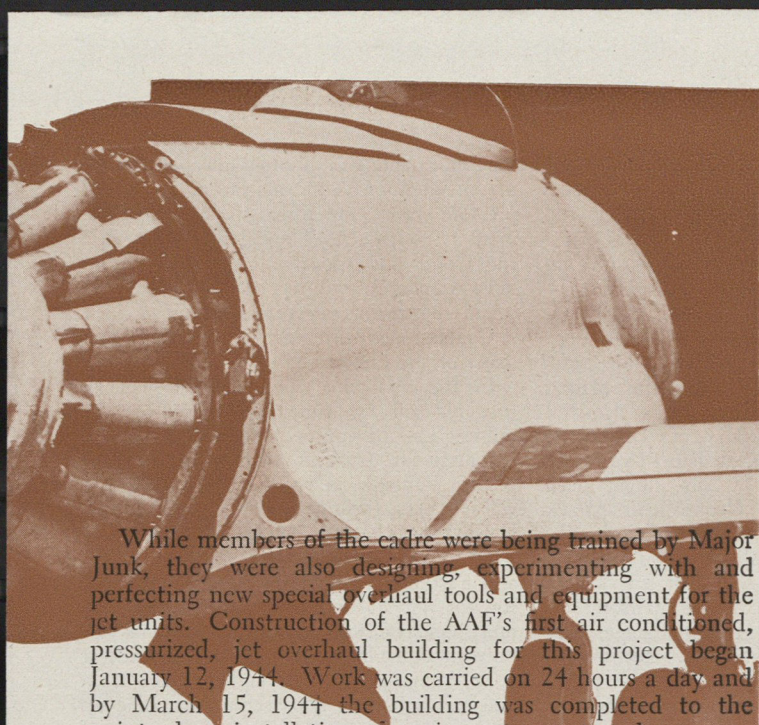
Accompanying Major Junk to the GE plant were nine civilian employees of the command. Their orders announced prosaically that they were "to receive training on a specialized overhaul facility to be established at SBATSC." To a test base in California also went 10 additional men for training on another phase. Some inkling of their mission was discovered by the groups on arrival at West Lynn and Muroc, Calif. flight test bases. The superchargers they expected to learn to overhaul turned out to be the AAF's new aircraft gas turbines for jet propulsion which Group Captain, later Air Commodore, Frank Whittle, K.B.E., of the RAF had designed and developed in the United States by GE for our first jet aircraft.

In the next four months personnel of "Project I," as the program was designated, studied aircraft gas turbines at the GE plant. There they overhauled some of the first jet engines used in the XP-59, twin jet Airacomet. On Feb. 3, 1944 the run-up of the first jet engine designed for the P-80 was made. From there the cadre joined the rest of Project I at Muroc to overhaul the secret jet engines which were undergoing special tests at the time.

"Shooting" parts of Shooting Stars in making or, technically, gas turbines for the J-33-9 on production line at San Bernardino, Calif.







While members of the cadre were being trained by Major Junk, they were also designing, experimenting with and perfecting new special overhaul tools and equipment for the jet units. Construction of the AAF's first air conditioned, pressurized, jet overhaul building for this project began January 12, 1944. Work was carried on 24 hours a day and by March 15, 1944 the building was completed to the point where installation of equipment was started.

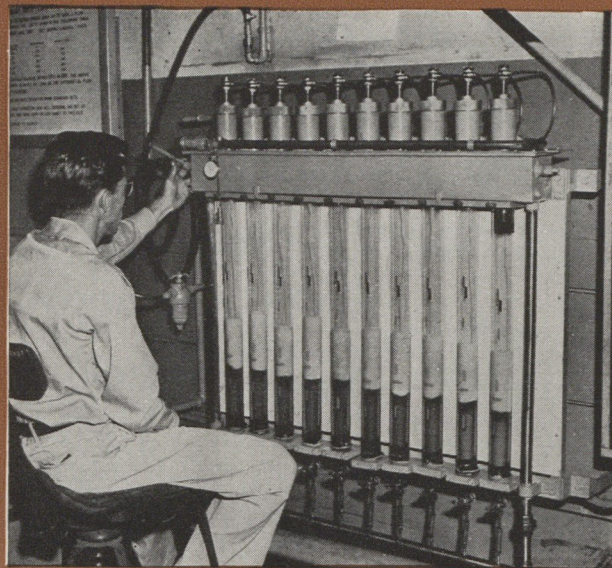
Production overhaul of the J-31, XP-59 Airacomet propulsion engines began May 1, 1944. The first of these engines to be rebuilt was returned to service June 2, 1944. The XP-80 Lockheed "Shooting Star" was first flown at the Muroc base June 1, 1944. By fall of 1944, P-80 engines designated J-33 began to arrive for overhaul at Project I. Calibration of test cells, training of personnel, and design and fabrication of special tools for this more powerful gas turbine got under way in earnest. The first J-33 engine overhaul was completed October 12, 1944.

Equipment for overhaul of jet engines, which Major Junk terms "glorified blow torches," is entirely different from equipment used in repairing ordinary engines. It requires extremely accurate balancing machines for parts that revolve at hitherto undreamed of speed and centrifugal force; heliarc and atomic welding, which involve tremendous heats; and protected high speed pits to rotate certain components to destruction. The latter method is used to make sure parts are strong enough to hold up in the jet engine. Ordinary wearing down of parts is not the principal problem with jet engine maintenance, Major Junk says. Because of the great internal stress and heat, due to the fact that the engine functions at high speed, the problem is mainly one of metallurgy, balance, strength and perfect fit of parts.

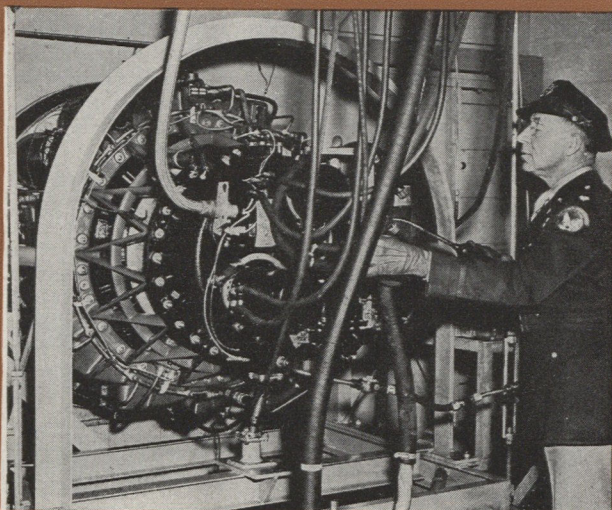
Test cells also are different. The engine is placed on a swinging frame, a movable base which measures thrust power instead of horsepower. The cell walls are made of reinforced concrete with heavy steel doors, and all observation of jet engine performance is made through narrow slits in the reinforced concrete cell walls.

At the present time jet engines are overhauled in bays by all-around expert jet mechanics. There has been a steady reduction in the man-hours required for complete overhaul of jet units, but the procedure still requires more time than is necessary for reciprocating engines.

The project has served also as a training center for the AAF, Navy and industry. About 100 civilian employees of SBATSC, more than 100 AAF officers and enlisted men and 29 Navy officers and enlisted men have taken extensive courses in jet engine repair and maintenance at the project. Many factory and field representatives from the aircraft industry also have studied the details of jet engines at Project I, and obtained first hand experience from flight engines as to what actually occurs under field service conditions. ☆

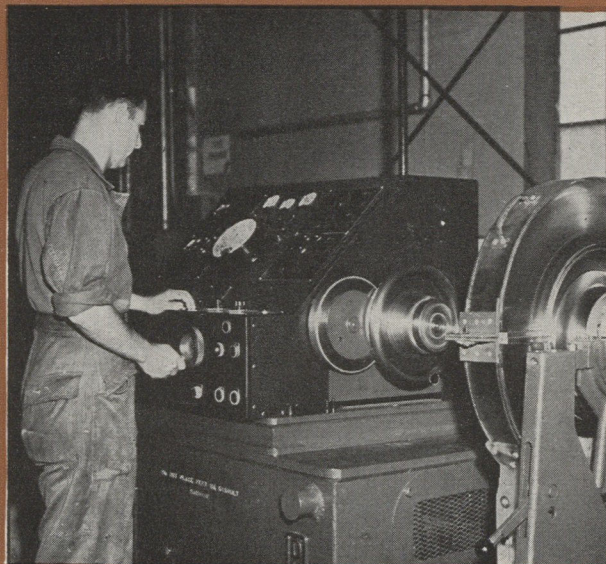


The wheel, an integral part, must be in dynamic balance.



All parts of turbine are thoroughly tested before shipment.

Fuel nozzles are supplied in carefully co-ordinated sets.





## "BIG BANG"

(Continued from Page 5)

were already back on civilian jobs when Crossroads came up. Colonel Cullen and his scouts went to work with speed and zeal. If the man they wanted was in the Army, they requested his re-assignment to the Air Photo Unit; if he were a civilian, Colonel Cullen gave him a sales talk about taking leave of absence until after Bikini. The challenge of the assignment alone usually did the trick, and the civilians were signed up as Technical Consultants. At the moment, the unit has about as many wearers of the "ruptured duck" in its ranks (some are ex-Navy photographers) as GIs.

Fortunately there was Wright Field from which to draw. The chief of Wright's Photographic Division, Technical Intelligence, T-2, Lt. Col. Richard "Joe" Cunningham, former RKO film editor, became officer-in-charge of all photographic operations for the photo unit. Temporarily stripping his T-2 division of most of its personnel, Colonel Cunningham brought with him installation experts, aerial and ground photographers and ultra-high-speed cameramen, all with years of experience and some with thousands of hours of flying time.

Major P. M. Thomas, chief of the Special Photo Services section of T-2, is now chief of the technical motion picture section of the Crossroads unit. Also from Wright Field is Amrom Katz and about 15 other photo-physicists from the Photo Lab known as the "Katz Kommandos."

Deputy commander of the photo unit is Lt. Col. Richard S. Leghorn, former physicist for Eastman Kodak Co., and CO of the AAF's 67th Tactical Reconnaissance Group with the 9th Air Force.

Maj. John D. Craig, deputy OIC for motion pictures and chief of the documentary motion picture section, was formerly CO of the 9th Combat Camera Unit and later chief of the overseas motion picture services for Headquarters, AAF. Also veterans of much combat action are ex-prisoner-of-war Capt. Walter "Butch" Resce, who was wounded several times while flying photo missions with the 15th Air Force and finally shot down returning from Ploesti; ex-Capt. Lloyd Knechtel of the 8th AF; Don Christiansen of the 12th; ex-Lt. Charles Nerpel from MAAF; Capt. Clark H. Ramsey from the 5th; and ex-paratrooper Capt. Rene A. Dussaq.

Two of the men who helped film the AAF's sensational "The Last Bomb"—Maj. Gil Warrenton, A.S.C. and ex-Capt. Tom Tutwiler, A.S.C.—will operate motion picture cameras in the photo planes. From the photo section of AAF's Proving Ground Command at Eglin Field is Capt. Bill Joyce, former chief photographic test officer for bombardment, now air operations officer for the photo unit.

In charge of all flight operations is Maj. George Birdsong, former 8th Air Force B-17 pilot, and at the controls of his ships are the AAF's foremost photo pilots, according to the Major. Every airplane commander has at least one combat tour under his belt. Some, like Maj. Danny Forbes, assistant operations officer, has two—with the

8th and 20th Air Forces. Birdsong's squadron navigator is Maj. Bill Jones, who possesses one of the outstanding records in the 8th AF, and his squadron engineer is Capt. Robert Campbell, late of the 73rd Wing VHB, who has 1,000 hours in B-29s.

Photo planes must be in their exact predetermined positions at time of bomb-drop. Because timing is as important to air crews as to the photo men inside the planes, intensive rehearsals started early at Roswell and continued for several weeks before the photo unit moved to Kwajalein. Dozens of "co-ordinated missions" were flown with planes from the Task Group's Air Attack Unit. On these missions, practice bombs were dropped on the Albuquerque bombing ranges, and later over water off San Diego, where signals could be picked up from surface ship in much the same manner as they will be picked up at Bikini. No one is more uncomfortably aware than the photo people themselves that this is one performance where cues cannot be missed.

As it stands now, this is the revised Master-Plan for the photo planes on D-Day: Commencing about an hour and a half before H (actual moment of bomb-drop), periodic voice broadcasts from the bomb-dropping airplane will advise all aircraft and supporting surface vessels of the plane's position and estimated time of bomb-release. There will be dry-runs on the target so that all timing apparatus (both Army and Navy) may be accurately synchronized. Radio signals, received from the bomb-dropping airplane, will also be relayed by the Los Alamos Laboratory ship (USS Cumberland Sound) to all air and surface units. Sixty seconds before actual bomb release, a tone signal will be turned on in the bomb-dropping airplane. This signal will be heard by all ships and planes. When the bomb is dropped, the signal will be automatically broken and H-time will be established. In the intervening seconds between H and M (burst time), signals will be received from the Cumberland in this order: M minus 20 seconds, M minus 5 seconds, M minus 2 seconds and M minus zero.

At zero moment, Flight A, consisting of four F-13s, will be circling in a counter-clockwise position around the target at 26,000 feet about 14 slant-miles away. Ultra high-speed cameras (1,000 frames per second) will be mounted in the left blister sighting position.

Elsewhere throughout the plane, some 26 other cameras, both still and movie, will photograph the blast from all angles. This flight will continue to circle until M plus 6 minutes and then will return to Kwajalein with its exposed film.

Flight B will consist of three F-13s with UHS (ultra-high-speed) cameras in the bombsight position, and one F-13 with UHS cameras in the left blister. These four F-13s are reserves for Flight A. One will fly behind and to the left of the bomb-dropping airplane and will photograph the bomb run and the bomb fall. The others will trail the bomb-carrier at from 1,000 to 3,000 feet above bombing altitude to take explosion pictures head-on.

Two camera-equipped C-54s will fly at 12,000 feet, also some 14 to 15 miles from

the blast, and will photograph bomb-detonation phenomena for analysis of shock and pressure waves, and for historical and documentary purposes. They will photograph the cloud and movement of the column until M plus 30 minutes or more, unless recalled sooner for safety reasons.

Camera controls are so adjusted that many of the cameras, chiefly those entrusted with the vital first four seconds, will be triggered off by the Cumberland's radio pulses. The M minus 5 second signal will automatically trip off the Jerome motion picture cameras in the bottom turrets and will also start the modified K-24 still camera in the forward bomb bays of all F-13s.

M minus 2 seconds will start the Fastax and Eastman UHS. There is a definite reason for not starting these cameras one second sooner or later: each of the cameras has only enough film to run for four seconds at 1,000-frames-per-second, and it takes from one and a half to two seconds to come up to speed. Therefore, if it is begun at M minus 2, it will be running at top speed at M and will run until M plus 2 seconds. However, the Fastax and Eastman make up a dual unit, tandem-mounted, and so it has been possible to set up within the mechanism itself a time-delay relay control which triggers off the bottom, or Eastman, UHS, at exactly M minus 5 seconds.

Manually operated upon signal are the remaining F-13 top turret 35 mm Jeromes, all of which are remotely controlled from the CFC (Central Fire Control) with the CFC cameraman using the gunner's scanner for camera-aiming and operation; also, the Mitchell high-speeds and standards (movie) in the left blister and tri-metregon position, four K-18s (oblique), a vertical K-18, K-17B, a pair of split vertical K-22s, a hand-held Eyemo motion picture camera and an O-5A radar scope camera trained on the AN/APQ-13 radar to record the complete radar picture of burst and cloud.

Probably the most exciting piece of equipment in the entire F-13 is the Electronic Control mechanism specially designed and built by Capt. F. M. Crawford of Wright Field and installed in the rear pressure cabin. No existing equipment could meet the triple requirement of (1) remote control, (2) camera time recording, and (3) high-speed timing, so Crawford and his men—K. J. Jones, Merl B. Worland, F. A. Farinet and Jack Warwick—improvised. Taking some radar sets and spare parts from anything else that was handy, they constructed 12 sets in less than two weeks. The result is probably one of the most advanced applications of electronics to high-speed photography yet developed.

In addition to the radio relay receivers which trip off by remote control the cameras described above, the mechanism consists of two parts: (1) apparatus which will automatically record exactly what time each camera in the plane started to operate, and how long it ran; and (2) a pulse amplifier which does the high-speed timing.

In Crawford's own words here is how his gadget works: "There is a precision electronic oscillator which drives a pulse amplifier; this changes the shape of sign waves to pulse waves, and these in turn



drive a 'flip-flop' (controllable square-wave) generator. The square-wave signal generates the actual power for the Argon lamp which is exposed on the edge of the film while running through the camera, and results in tiny dots for timing purposes.

"The rate of acceleration of the high-speed camera may vary slightly from one second to another, so that it becomes necessary in a precision-analysis job of this type (where rates of changes in the bomb-burst are all-important) to be able to record on the edge of the film itself something which is absolutely constant. In this case, it is the electronic time-dot, capable of being measured down to 500 micro-seconds."

The camera set-up in the C-54s differs slightly from that in the F-13s. The entire port side of the passenger cabin is one solid collection of cameras on steel mounts suspended from the top by Bungee cords. The lower bank consists entirely of K-19 night cameras, all of which are automatically set off by photo-electric cells reacting to the brilliant light of the blast itself.

Filters are so adjusted that ordinary daylight won't start the cameras. On the next bank are K-22s with 40-inch f/5 Baker distortionless telephoto lenses. These K-22s, by the way, are capable of faster cycling than any other 9 by 9 aerial camera; they click off a picture, wind the film and cock the shutter for the next exposure once every two seconds. Then there are K-18 and K-24 type cameras, all connected with intervalometers which set the interval at which the pictures are to be taken. Immediately to the rear of the escape door is a steel rack on which six Eastman UHS cameras rest. Like those in the F-13s, these are also set on time-delay relay controls, with starting times staggered from M minus 2 seconds to M plus 12 seconds.

Behind the rack of UHS cameras are five positions for motion picture cameramen operating Bell and Howell 35 mm A-7s, 16 mm color B-1As, and Mitchell high-speeds (120 frames-per-second) and standards (24 f.p.s.). There is practically no room to move in this section, and at least part of the time one or two of the cameramen will be lying flat on the floor.

Near the end of the cabin in one of the C-54s is the AAF's "Big Bertha," reported to be the largest operational aerial camera in the world and which, incidentally, will be run by the smallest man in the whole photo outfit, William Mungall from Wright Field, the Bertha's designer. The camera is a K-18 with a 48-inch lens, weighs 200 pounds, holds 390 feet of film, and will make 250 9x18 exposures, the largest Crossroads aerial stills. Finally, in the rear

of the plane there has been installed special recording spectrophotometric apparatus using the Sonne S-7 camera (smear camera) designed to give a time-intensity and wave-length analysis. The equipment was built by Dr. D. E. MacDonald and Dr. R. M. Frye, physicists of Boston University who are now attached to the Air Photo Unit.

And then there are the cameras in the drones, or un-manned, remote-controlled B-17s, which will be sent into the atomic cloud. There will be two K-17s and one Jerome movie camera, all started off by remote radio control. If the drones survive, the exposed film in these cameras (provided it is not completely ruined by radio-activity) is expected to supply technical details impossible to obtain otherwise. On board the drone or "Babe" plane will also be two television cameras, one pointed out the nose, the other at the plane's instrument panel. Modified O-5 cameras will photograph the television picture so that scientists will have an actual record, both of the inside of an atomic cloud and the behavior of aircraft instruments in the vortex of such a blast.

The major part of the film, both still and motion picture, will be rushed back to the States on courier planes for processing in commercial and Army film laboratories. As security is of utmost importance all film will be under guard from the time it is taken out of the cameras until it is finally developed.

The major photo-interpretation job will take place at the Aeronautical Chart Plant in St. Louis, where all AAF aeronautical war maps were made. "It might possibly take several years before the final photo analysis is completed," said Colonel Leghorn, who besides being Deputy CO is in charge of technical photography for the unit, "but we must get the bulk of the film analyzed before we photograph the second atomic burst (a few weeks after the first) so that we can make any necessary alterations in our plans regarding cameras, kind of film, filters and shutter speeds."

Photographers themselves await the outcome of the films as eagerly as do the scientists. They hope to find out, among other things, a good deal more about this matter of the effect of intense light, heat and radio-activity on the film. Whatever the results, it is a certainty that the Crossroads photo project, in addition to providing invaluable records for scientific study and priceless documentary prints for public release, will itself contribute more to the science and technique of aerial photography and high-speed photo-timing than any other single event is ever likely to produce. ☆

such as color blindness, were examined minutely. All the newer drugs which Air Force personnel might use were tested under varying conditions. Atabrine, sulfadiazine and streptomycin were subject to scrutiny before being generally used by flying personnel. The problem of convalescence was made a special project to which hundreds of men in regional hospitals can credit improved methods of treatment.

Among the results of research at AFSAM which civilian industry and education may well adapt in the future are the psychomotor tests. These selection tests, designed to measure physical and mental characteristics necessary for flying skill, have been developed by the school's department of psychology. They have been so successful in the AAF that several allied air forces have adopted them.

Important medical problems in aviation are often apparently simple. Air sickness is an example. Anyone who flies can become airsick—five out of every hundred trainees do on their first flight. With proper orientation and understanding of physiology in relation to the action of a plane, this problem can be greatly reduced. By bumping, pitching, yawing, lateral rotation, or cork-screwing, an aircraft can jam the switchboard of a flier's sensations which come by way of his eyes, inner ear, muscles and joints. Within ten flights ordinary adjustments will reduce airsickness to about one student flier in a hundred.

During the war, in order to observe the AAF's aero-medical methods, commissions were sent to Texas from England, Canada, Russia, Australia, New Zealand, South Africa and South America. From England, China, Mexico and South America, students came to take courses.

Having carried to a successful completion this important phase of the AAF's wartime job, the School of Aviation Medicine, under the Command of Brig. Gen. Eugen Reinatz, will continue in peacetime as part of the Air Force's new university system. It will bring into this period an experience of long growth, extending back to the first World War.

Throughout its development AFSAM has followed a progressive theory of medical practice. It represents a common denominator between the medical profession and the Army Air Forces. Its triple program of training, research and hospitalization has brought the best new ideas in science quickly to bear on the medical problems of aviation. Since many of the departments participate in all three phases of the School's program, an AAF research specialist in otolaryngology or ophthalmology does not lose contact with actual practice, nor does a teacher get out of touch with new laboratory techniques.

Like other medical schools all over the world, AFSAM now looks to peacetime objectives. Not only members of the Air Force but also the large population of air-minded civilians have a stake in those objectives. Toward them the School of Aviation Medicine will work with the help of its "alumni"—the thousands of AAF medical reserve officers who have returned to offices, clinics and hospitals. ☆

### Answers to "How Sharp Are You?"

Photo on Page 2

Questions on Page 35

- |                |          |
|----------------|----------|
| 1. Four        | 6. Five  |
| 2. Seventy-two | 7. False |
| 3. Three       | 8. None  |
| 4. Three       | 9. No    |
| 5. P-47        | 10. True |

### MEDICINE IN THE SKY

(Continued from Page 7)

Center, the research laboratories at Randolph Field were concerned primarily with the human side of the story, the air crew and its medical experience. Every stage of a flier's physical experience, from testing his aptitude as an air cadet to the analysis of aircraft accidents, was on the agenda of these laboratories. The plagues of flying,



## AIRFIELDS—GERMANY

(Continued from Page 13)

The machinery snafu was solved by marshaling all German cement plants, concrete pouring machinery, cranes, power shovels, narrow gauge railways and other equipment—a rather amazing polyglot of American machinery operated by AAF engineers, Luftwaffe prisoners and German civilians.

Stockpiles of German cement were insufficient, so several cement plants were put into operation. It was necessary to reopen coal mines to supply fuel, and several gypsum plants were put back in operation. In a short time two cement plants were producing 600 tons daily and eventually supplied 64,000 tons. Rubble from the streets of bombed German cities was put at the disposal of the engineers, too.

The autobahn contractor arrived at Oberpfaffenhofen with a huge paving machine resembling a Rube Goldberg comic strip contraption. It operated on rails and laid a strip of concrete 25 feet wide at the rate of 900 feet a day. An interesting device on it was the precision control of the bucket which allowed the operator to place the cement exactly where it was needed. Concrete mix poured by the machine came out dry enough to walk on. As a five-inch base was laid, a hammering device packed it down and another bucket poured a three-inch top surface. The machine ran 20 hours a day, and was overhauled during the four idle hours. Thirty thousand cubic yards were churned out to give this USAFE base perfectly smooth surfaces.

At Schleissheim the 816th Engineer Aviation Battalion encountered probably the knottiest problem of all when it built the medium bomber base. It was this outfit that had to move a village and railway station to build an airfield at Aachen last winter. A forest of 23,000 trees at Schleissheim was removed by axes M-1 and bulldozers D-8, and a trolley line had to be rerouted.

A bomber base at Lechfeld required 5,000 cubic yards of cement to fill craters left by AAF bombs, and 5,000 German freight cars of gravel and sand were sent to the field from Munich over a 35-mile rail line that first had to be repaired.

Of all the gasoline storage facilities on the 33 fields, the 9th Engineer Command computed that 85 per cent were German. At the heavy bomber base at Giebelstadt, for example, storage capacity captured was 248,000 gallons and at Frankfurt, 226,500.

Use of material salvaged in France and of German machinery, installations and labor expedited the airbase reconstruction program so that it was completed before winter set in. Pierced steel plank was used on about one-fourth of the fields, macadam and aluminum planking on some, but concrete runways were laid on the majority of the bases.

Only a few tactical airbases in France have been retained by USAFE. One on the Cherbourg peninsula is being considered for reconversion as an international air terminal. Most all have been stripped of salvageable material and turned back to the French peasants. A recent survey revealed that of the 98 fields in the A (American) series,

81 had been abandoned; 67 of the 97 Y (Yankee) and 39 of the 96 R (Rebel) fields had been discarded. A few are being used by the French and RAF. Others in France, Belgium, Netherlands and Luxembourg may be turned over to the respective governments, pending future negotiations.

Three aviation engineer battalions have been retained by USAFE to keep its network of bases in order, but the rest of the veteran engineers, in the ETO since 1942, are back home now or on their way. From Bremen to Berlin in north Germany to south of Munich in the foothills of the Alps, from the Rhine to the west of Vienna in Austria, from points in France, Belgium, Holland and Luxembourg the AAF is operating from sturdy, well-constructed bases. The aviation engineers have finished their last big job. ☆

## UNSHACKLING SHANGHAI

(Continued from Page 10)

the fliers in an effort to get their insignia and shoulder patches for souvenirs. Thousands of civilians swarmed over the airfield greeting the arriving Chinese troops and the American crews. Operations were slowed down considerably. Repeated requests were made to the Chinese authorities to provide guards and restrict certain areas. The repeated answer was that this was a Chinese holiday; the people had been liberated, they should have a free run of all areas that had been occupied by the Japanese. Conditions became so bad that it was necessary for operations to be moved to another field.

About five days after the start of the Cannon movement, Colonel Davania started out on a reconnaissance mission to find a new airbase. He had photographs showing Kiangwan airdrome six miles east of Stiaziang but these photos did not show any roads leading to Kiangwan. After driving several miles, Colonel Davania discovered a high brick wall which ran around the perimeter of what appeared to be a military installation. This wall was followed until a barricaded entrance with no guard was found. Colonel Davania now tells his story of "stealing" the Jap field.

"We drove into the reservation and started an inspection of all warehouses. The inspection was progressing very well until the Japanese discovered our presence and picked us up to take us to the commanding officer. The commanding officer refused to see us. However, he would not permit us to leave the reservation even though we suggested we would come back at a later date. We were taken to the Japanese officers' club and held in what I would call the main lounge. In discussions with the personnel coming in and out of the club . . . we discovered this was a navy airdrome and had been used for the training of navy cadets. We were served some sort of an orange drink and discussed aircraft identification, which apparently had been their latest subject. Several hours elapsed before the commanding officer decided he could see me. I was escorted to an office in the same building within which the club was located. Upon explain-

ing my mission to him, I was told again the peace had not been signed and that . . . we had no business on the airdrome and would not in any way be permitted to use it. He did, however, furnish me with an escort to the gate and I was told very politely to leave and not come back. After being escorted to the gate of Kiangwan airdrome, I proceeded directly to Stiaziang and instructed the commanding officer of the cadre that we would start moving operations into Kiangwan the following morning at daybreak. All equipment and personnel were loaded on trucks and dispatched at daylight the following morning for Kiangwan.

"I prepared the C-47 which was being used as a tower for departure and waited until there were five C-54 aircraft in the Shanghai area. I took off for Kiangwan and instructed the C-54s to land directly behind my C-47. Upon landing at Kiangwan we immediately unloaded the Chinese troops and threw a guard around the entire parking area. The Japanese occupying the airdrome were taken completely by surprise and very little resistance was offered. From this time on, daily improvement in the entire operation was noted."

Staging at Liuchow was complicated by extremely limited facilities and the presence of large Chinese units. Bengal crews brought their own bedding and frequently their own rations. Chinese troops were not made regularly available for shipment and because their proper identification was impossible many other Chinese troops and personnel, not belonging to the 94th Army, found their way into Cannon Project aircraft. In order to complete the mission in the shortest possible time, some planes carried as many as 80 Chinese soldiers.

Added to these problems was the limited equipment for loading and refueling—a standard China handicap.

At Shanghai, as already noted, all facilities were bad and were difficult to improve during the course of the movement. For the first three days, Americans and Japanese shared the same operations counter; the crews of ICD filing clearances, the Japs running scheduled service to Tokyo. At this time, Allied military personnel in the Shanghai district numbered less than 50. Jap flags flew from all buildings and requests for transportation and other assistance depended entirely upon the voluntary cooperation of the Japanese military.

In spite of these difficulties, ICD's Cannon Project fleet of 60 C-54s moved in 409 sorties from Liuchow 2,123 tons of troops (26,237 Chinese soldiers) and supplies weighing 388 tons. At the same time, it moved 2,500 tons of supporting gasoline from India to Liuchow. All this was accomplished between September 9 and September 28, 1945.

Supplementary airlift of further personnel and equipment from Liuchow and the Kunming area to Shanghai by the same Bengal fleet, terminating on October 18, was included as part of the over-all Cannon Project under the names "Gunpowder" and "Air" movements. Final total of the entire movement: 31,679 troops, 4,554 tons of troops and supplies, and 769 sorties. ☆



# The Album

## FLYING TOGS



In 1910, handle-bar moustaches, hard collars, and sport caps worn with the peak to the rear, were the proper accoutrements for our earliest 'hot' pilots.



In 1920, the styles appealed to the entire family. In 1929, the all-leather suit for winter and the light coverall for summer flying was used generally.



19??—The airmen of tomorrow, on their flights into the stratosphere, will be decked-out in a pressurized suit, inverted fish-bowl and all.



These are later styles. Back in 1925, the birdman on the left thought he was pretty sharp. The next two suits are vintage 1931-35. With the 'forties' came higher altitudes and emphasis on comfort, not looks.



IMPORTANT

• USE YOUR

CHECK LIST

IMPORTANT

• USE YOUR

CHECK LIST

IMPORTANT

• USE YOUR

CHECK LIST

IMPORTANT

• USE YOUR

CHECK LIST

