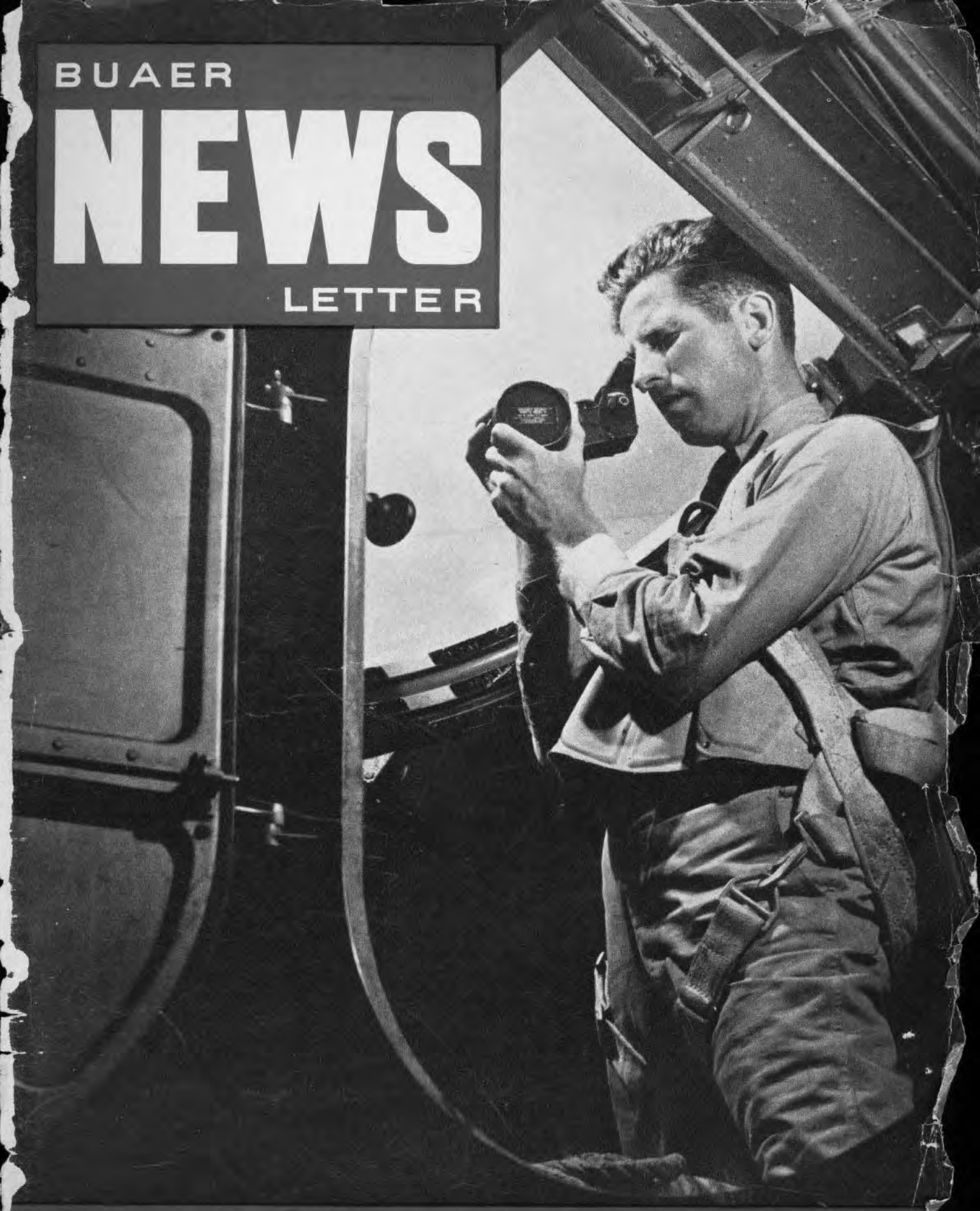
BUAER

NEWS

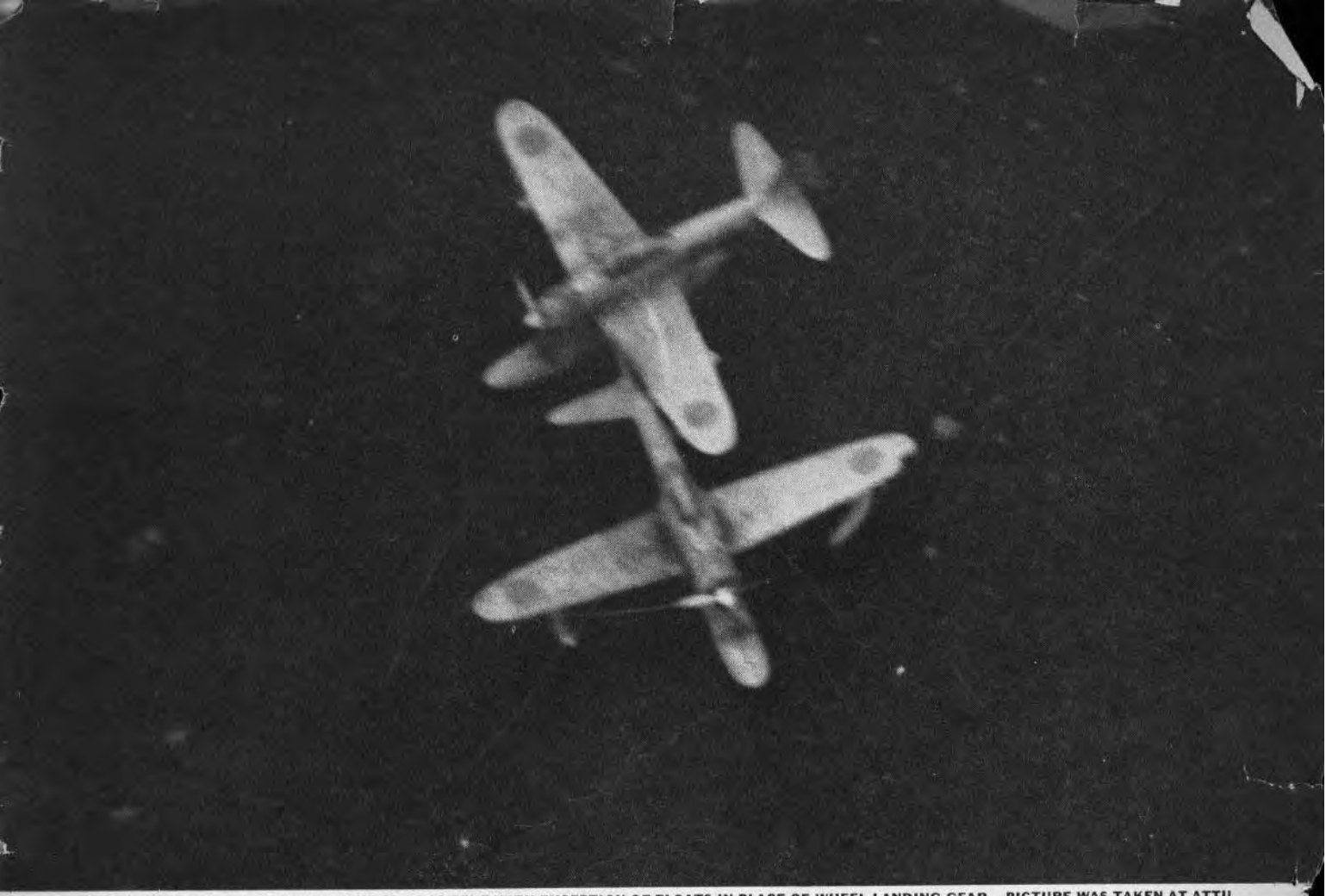
LETTER



Apr. 15, 1943

ESTR

Swimming is stressed at Pre-Flight Schools (see *story*)



RUFE IS BELIEVED STRUCTURALLY THE SAME AS ZEKE WITH EXCEPTION OF FLOATS IN PLACE OF WHEEL LANDING GEAR. PICTURE WAS TAKEN AT ATTU

Japanese Fighter Aircraft

"Zero" signifies a type, not a plane. Zeke, Hap, Rufe Pete, Dinah are code names for Zero models

IN the early stages of the war, the designation "Zero" probably was used erroneously as a generic term for almost any type of Japanese fighter aircraft, and this has resulted in a certain amount of confusion. The term "0" or "Zero" was derived from the Japanese year 2600 which coincides with our year 1940, and merely indicates that the aircraft was put into service originally in 1940.

The phrase "Zero" may refer to a single place carrier-borne fighter or to a similar version on floats. In addition, it may be used to designate a float reconnaissance-biplane or a two-engine land-based reconnaissance-fighter. As a matter of fact, Zero models of all the aircraft mentioned above have been identified. They are known today by their code names, "Zeke," "Hap," "Rufe," "Pete," and "Dinah." In addition there is a bomber called "Gwen" and a small submarine based float biplane called "Glen," both of which bear the Zero classification.

At the present time, there are two Zero fighters, "Zeke" and "Hap." "Zeke" is designated by the Japanese as the Type Zero, Mark I, Carrier-borne fighter, Model 2. The desig-

Contents

BUREAU OF AERONAUTICS
NAVY DEPARTMENT - NO. 191

ZEKE IS KNOWN FOR ITS LOW WING LOADING, STEEP ANGLE OF CLIMB AND STURDY CONSTRUCTION

nation of "Hap" is the same, except that "Hap" is Mark 2 where "Zeke" is Mark 1.

"Zeke"

"Zeke" is the fighter which has been encountered frequently in current operations in the Southwest and South Pacific Areas. It is capable of a maximum emergency speed of about 326 miles per hour at an altitude of 16,000 feet. An outstanding feature of this aircraft is its high rate of "zoom." It can "zoom" nearly vertically, and the "zoom" can be continued for 1,500 to 2,000 feet depending on the starting speed. This should not be considered, however, as indicative of the rate of climb of this aircraft. The maximum rate of climb at sea level has been found to be approximately 2,750 feet per minute. The service ceiling is estimated at 38,500 feet. The normal range of this airplane is believed to be about 1,290 miles at 170 m. p. h., but by addition of a belly tank, which can be dropped at will, a maximum range of some 1,870 miles at 168 m. p. h. (economical cruising speed) is believed possible.

"Zeke's" low wing loading, steep angle of climb, well-streamlined structural design and exceptionally sturdy construction make it a highly maneuverable aircraft at moderate speeds. However, in recent tests where "Zeke" was flown in combat maneuvers, against several of our aircraft, two points of weakness were detected in the Japanese fighter. (1) At high speeds, the rate of roll is extremely slow, and (2) the engine cuts out if the nose is lowered suddenly to enter a dive. In addition to these points, the vulnerability of "Zeke's" fuel and oil tanks is well known since these aircraft carry neither armor nor self-sealing protection for the tanks. In some instances in the past, it has been reported that wings have been torn off Zero fighters, when recovering from extended dives at high speed. The model tested, however, although intentionally designed for light construction, appears capable of reasonably high diving speeds if properly handled.

"Hap"

There are several other types of Japanese fighters at present in operation. Prominent among these is "Hap," a new fighter with nearly square wing tips, reported as superior to "Zeke" in maneuverability and to have an even higher speed and rate of climb. It is reported that Japanese pilots of this plane have not hesitated to follow our fighters in power dives, which may indicate an increase in structural strength.

"Nate" is another Japanese fighter which has seen service in many of the Pacific areas. This is an older model (Type 97) and does not equal the speed or performance of the more recent "Zeke" or "Hap." "Nate" is believed to have a top speed of approximately 250 miles per hour at 13,000 feet altitude. With maximum fuel, at economical cruising speed, it is believed to have a maximum range of slightly over 1,000 miles.

"Oscar" (Type 1) is believed to be a more recent modification of "Nate." It has greater maneuverability and a good rate of climb but is believed to be about 20 miles per hour slower than "Zeke" at top speed. Like "Zeke," "Oscar" has an exceptionally long range when carrying maximum fuel and is believed capable, under these circumstances, of obtaining approximately 1,700 miles at economical cruising speed.

In addition to the land-based fighters mentioned above, there is also a Zero floatplane called "Rufe." Except for substitution of the floats to replace the wheeled landing gear, this aircraft is believed to be practically the same as "Zeke" structurally. It is reported, however, to be considerably slower than "Zeke" and less maneuverable.

Engines

All of the Japanese fighters mentioned above are powered with radial

Letterpress

It was not the fault of the mail service that you did not receive an April 1 issue of NEWS LETTER. Actually, there was no issue bearing that dateline.

Here's why. For some time it has been felt that NEWS LETTER should be printed by letterpress to improve its readability and to make room for more text without adding bulk or weight. Considerable time—in planning and production—was required by both the staff and the printer to change over to the letterpress process. It was therefore thought advisable to advance the date of this number to April 15.

Here are the changes which account for the new appearance: *1.* Printing—by letterpress instead of multilith, improving readability; *2.* Format—slightly larger, pages being roomier; *3.* Lighter stock—giving as much message, and more, in half the ounces; *4.* Design—which dramatizes certain items and gives all others an equal chance of gaining your favor.

OSCAR, USED CHIEFLY IN THE CHINA AND INDIA THEATRES, IS BELIEVED TO BE ABOUT 20 MPH FASTER THAN ZEKE AND, LIKE IT, HAS EXCEPTIONAL RANGE

air-cooled engines. "Nate's" engine has nine cylinders and is estimated to produce about 790 horsepower at an altitude of 11,500 feet. The engines used on the other fighters are twin-row with fourteen cylinders, and are believed to produce 900 to 1,000 horsepower at about 11,500 feet. The armament of "Zeke," "Rufe," and "Hap" consists of two 20-mm. Oerlikon type cannons, one in each wing, and two 7.7-mm. machine guns firing through channels in the upper part of the engine cowling and synchronized with the propeller. "Oscar's" armament is believed to consist of one 7.7-mm. and one 12.7-mm. machine gun firing forward through the propeller disc. Wing guns for this model have been reported but not confirmed. "Nate's" armament is believed to be the same as "Oscar's," although it is reported that a second 7.7-mm. gun is substituted on some occasions for the 12.7 mm.

HAP, A NEW FIGHTER, IS REPORTED SUPERIOR TO ZEKE IN MANEUVERABILITY, SPEED, AND CLIMB

Other Japanese fighters less frequently encountered include "Perry," "Claude," and "Dick." So far as known, these are little used at the present time. In addition to these fighters of native Japanese design, it is known that the Japanese Air Force has in operation a small number of Messerschmitt 109 E fighters. Whether these are copied from German models or obtained intact from Germany is not known. Up to the present, they have been encountered only in small numbers.

It is well to bear in mind that Japanese fighter aircraft appear to be used with minor alterations by both the Army and Navy Air Services. "Zeke" and "Hap," although used prominently by the Navy, have been reported in operation with Army units also. Likewise, "Nate" and "Oscar," which have been reported most frequently in use by the Army, have, upon occasions of emergency, been used by the Naval Air Service.

FLIGHT STATISTICS

Who Wakes The Guy That Wakes The Bugler?

During a formation landing of SNJ–4's, the leader lowered his wheels but failed to lock them and then landed with sufficient throttle so that the landing gear warning horn didn't blow until the wheels were on the runway. The gear gave way and the airplane settled on its belly. SNJ–4 Change No. 1, which permits a visual check to insure that the landing gear is locked down, had been incorporated, but the pilot was unaware of this.

The Trouble Board was of the opinion that more care should be taken in distributing similar change information to all hands; that it was obviously inadequate to incorporate the change and not inform pilots.

Grampaw Pettibone says

The Board's got something there! I'll vote for that; and it shouldn't be too difficult to set up a system in any squadron whereby pilots are informed of changes as they are installed, particularly those which in any way affect flight operations.

Now They Gas-Up All of 'Em

An instructor at a primary training station flew an N2S–3 for a period of 1.7 hours and then returned to the field to pick up a student for a check flight. The gas truck had left the line to obtain more fuel so the instructor decided not to wait to refuel his plane. The fuel gauge read two-thirds full and he *assumed* he had enough fuel for the flight. After flying through several maneuvers the airplane was landed at an outlying field where the instructor got out and directed the student to make six S-turns to a circle after which he was to make another landing to pick up the instructor. As the student reached an altitude of 50 feet on his last take-off, the engine quit and he was forced to land in rough sagebrush where the plane nosed over.

In reporting this accident the commanding officer stated: "The standard doctrine in effect at this station has provided for the refueling of training planes after each flight, regardless of the length of time training plane was in the air. This has been done primarily to prevent solo students from running out of fuel. The doctrine has not been mandatory insofar as qualified naval aviators are concerned. However, since this accident the doctrine has been applied to all pilots regardless of their qualifications."

Aircraft Flight Time

An increasing number of operating squadrons are remiss about sending in their "Quarterly Aircraft Flying Report" (Form N. Aer. 422). While this form is short and easily filled out, it is an important report because of its use in many different types of wartime planning. Please cooperate by submitting this report promptly. If accurate flight time of certain aircraft is not available, don't hold up the report; estimate the missing time and make a note to that effect on the face of the form.

Duck Soup

While simulating a strafing attack at a speed of approximately 250 knots, the pilot of an F4F–4 reported that he flew through a flock of ducks, several of which struck his airplane. This resulted in severe vibration and some difficulty in aileron control, necessitating an immediate forced landing. The airplane sank; the pilot received only mild shock and salt water immersion.

Close That Tunnel Hatch

In a recent period of approximately one month, three patrol planes capsized due to negligence and carelessness on the part of cognizant personnel who failed to close and secure the tunnel hatch prior to taxiing or attempting take-off.

With Comments by GRAMPAW PETTIBONE

Grampaw Pettibone says

It's my opinion this pilot got off mighty lucky. It used to be fun to chase ducks and occasionally "bag" a pelican, but that was back in the days when you had to have an extra fast plane to catch a pelican. With modern, high-speed aircraft, striking even a small bird may cause loss of control and result in a serious crash.

I'm not accusing this pilot of deliberately running into this flock of ducks; I'm merely warning all and sundry to stay well clear of such things, if possible. My Dad once told me of seeing a straw driven through a five-inch oak tree during a tornado.

Unauthorized Flight Proves Fatal

One rainy morning a yeoman came into the ready room of a training squadron and asked for a pilot to fly him to a neighboring field to deliver some official papers. A new instructor (250 hours), apparently thinking the yeoman had received authorization for the flight, volunteered and proceeded to request clearance from the squadron duty officer who was also new in the squadron. The weather was "instrument," and all planes were

grounded, but the inexperienced duty officer inferred from his conversation with the pilot that authorization for this special flight had been given by proper authority within the squadron. An SNJ–4 was warmed up and the pilot took off and disappeared into the low-hanging clouds which were then at about 300 feet. A few minutes later, he became confused in the overcast and crashed while trying to get back into the field.

BUREAU SAYS:

This crash was undoubtedly caused by the misunderstanding, lack of judgment and inexperience of the pilot and the squadron duty officer. In view of the existing "instrument" conditions, both of these officers should have demanded definite assurance that the flight was authorized by proper authority. The opinion of the reviewing authority of the board of investigation is concurred in: that proper indoctrination was lacking in this instance.

There seems to be some misunderstanding as to who may release flights and under what conditions flights may or may not be released. BuAer Manual, article 13–108, makes the commanding officer responsible for the release of all flights and further states that he shall not permit aircraft to take off when the state of the weather or other conditions jeopardize the flight. Article 13–110 (a) specifies that no aircraft will be taken into the air at any time without authority from the proper source, as designated by the commanding officer.

SecNav letter of November 23, 1942, subject, "Instrument Flying Qualifications, Instrument Flight Clearances, and Civil Airway Flying," published in Navy Department semimonthly Bulletin of December 1, 1942, is also pertinent to this discussion. This letter lists instrument pilot qualifications and also certain additional qualifications which pilots must fulfill before being authorized to proceed on instrument flights. It also specifies under what weather conditions instrument flights may be cleared. For example, pilots, even though they hold instrument qualification certificates, may not proceed on instrument flights unless they have at least 750 hours service flying experience, plus certain other requirements, and instrument flights may not be released for an airport at which instrument conditions exist or are forecast. Neither of these two requirements were met in the accident under discussion; therefore, not even the commanding officer would have been authorized to clear this flight.

The letter of the Secretary of the Navy prohibits all flights, except for certain specially authorized transport pilots, in which an aircraft is scheduled to land at any airport governed by instrument conditions. This order is equally applicable to local flights. Careful study of these references is recommended to all concerned.

Squadron Logs and War Diaries

There seems to be a misunderstanding in some squadrons as to the requirements for maintaining subject records. Navy regulations do not, at present, require aircraft squadrons to maintain or submit squadron logs. Certain wing and force commanders, however, require the maintenance of rough logs by aircraft squadrons. The bureau does not desire to interfere in any manner with such requirements.

The following references contain the wartime requirements for the preparation and submission of War Diaries and Special Action Reports by aircraft squadrons.

(*a*) CNO and COMINCH joint Restr. ltr., Serial 291, of Feb. 22, 1942.

(*b*) COMINCH and CNO joint Restr. ltr., Serial 3899, of 19 Oct. 1942.

(*c*) COMINCH and CNO joint Restr. ltr., Serial 299, of Jan. 23, 1943.

All Tangled Up

The following account of an NP–1 take-off accident was taken from the safety pilot's statement: "During a formation take-off, with the student at the controls, we went into a vicious groundloop. After recovering from this we proceeded to take off again but were unable to clear the west end of the mat, because the student's gosport tube became tangled around his stick, and as a result, the plane struck a snow-bank."

There was no injury to personnel, but the aircraft was damaged beyond repair.

Grampaw Pettibone says

I'm working on a three-seater idea so we can carry a safety pilot to watch the safety pilot.

Crash on Attempted Landing Following Mid-Air Collision

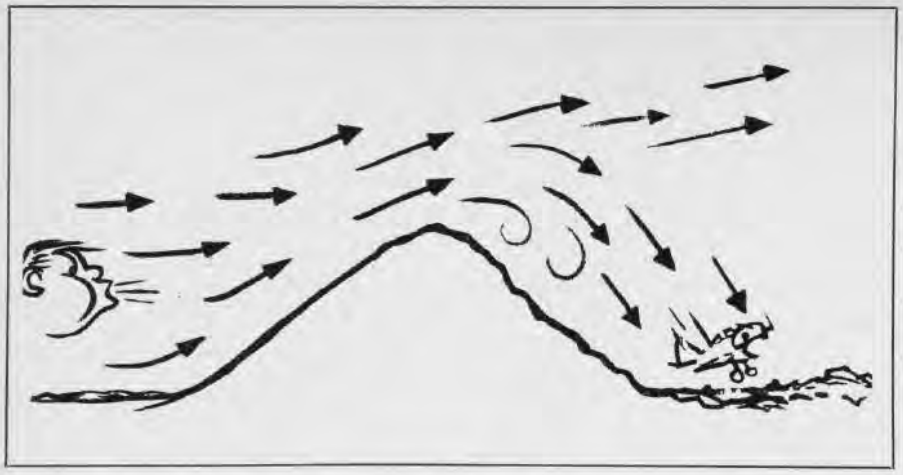
While attempting to regain altitude for another run on the target sleeve during fixed gunnery practice, the student pilot of an F2A–3 flew wide of his proper position and pulled up into the instructor who was observing the runs. The instructor was unable to maintain control of his aircraft and bailed out. The student's airplane lost its right flipper and horizontal stabilizer.

Without reporting the accident or any difficulty with his aircraft, and without notice to anyone of his position (perhaps his radio was out), the student attempted to land at the station field. As he was turning into the wind for his final approach, the airplane was seen to roll sharply to the left and crash to the ground. The investigating board gave as its opinion that this crash was due to loss of control while attempting to make a sharp turn for final approach at slow speed, with only one flipper and horizontal stabilizer on the plane.

BUREAU SAYS:

This pilot evidently did not follow instructions as set forth in Technical Order 48–40, which states in part:

"In the event of a collision or if the pilot suspects that his control system is damaged but is still sufficiently effective for cruising flight he will immediately climb to, or maintain, a minimum altitude of 5,000 feet



if sufficient ceiling exists, and will proceed to the vicinity of his ship or station or other suitable point. *The pilot should not be in a hurry* to land.

"Normally every advantage should be taken of communication facilities in order that personnel on the ground may be given full information and that suggestions may be received. Before losing altitude the pilot should test out controls in cruising condition at slow speed, then lower wheels and, if control remains, lower flaps and reduce speed to approximately landing speed, then try out controls with power on and with power off. If a safe altitude cannot be gained for such a check the pilot should exercise extreme caution in taking successive steps to put the airplane in landing condition and in reducing speed.

"When hazardous conditions render a safe landing questionable the passengers should be informed, if possible, and given the option of using parachutes. In the event that a safe landing speed cannot be maintained in any condition, other occupants (if any) and pilot have no recourse save that of abandoning the airplane. In some cases, where serious structural or control damage is apparent, and altitude does not permit of experimentation, abandonment must be executed without hesitation or delay."

After a pilot has tested his damaged plane and made up his mind to land it, he must use extreme care in planning his approach so that he can easily keep within the safety limits of speed and angle of bank that he has previously determined by test at a higher altitude.

The Little Things

It was just a little thing, that small rip in his life jacket, and he wasn't a sissy. Besides, he wasn't going to be flying over much water, so he took off and promptly forgot about it. Two hours later, while flying over very rough terrain, his engine began to cut out. There was not a field in sight, so he headed for the coast line and landed several hundreds yards off shore. The landing was hard, partially due to the rough sea conditions, and the airplane sank before he was able to get out the life raft. It was then he wished that he had exchanged his life jacket, back there before leaving the field; that would have been the sensible thing to do. And it would probably have saved his life, for he was drowned in attempting to swim ashore in the heavy sea.

Attention Section Leaders

While leading his section in for a practice primary formation landing a section leader neglected to allow sufficient room for his No. 2 man to clear an obstruction to port. The No. 2 man was concentrating on his leader and failed to see the obstruction in time to avoid it, resulting in extensive damage to the airplane.

BUREAU SAYS:

This is further evidence that section leaders must be continually cautioned as to their responsibilities in formation work. In order to build up that necessary unswerving confidence of his wingmen in his ability and judgment, a leader must at all times show consideration to them and prove that he has the welfare of the entire formation in mind during any maneuver.

Beware of The Leeward Side!

A primary instructor was coaching his student through a practice landing at an outlying field. The approach was low and when the airplane was over the boundary fence it suddenly dropped, hooked the tail wheel in the fence, landed hard and groundlooped to the left through a fence and into a ditch. At the time of the accident a 25–30 knot wind was blowing. The landing was being made on the upslope of a small hill which blanked out the wind and caused the airplane to drop unexpectedly as it crossed the fence into the field.

Grampaw Pettibone says

There's another natural phenomenon, closely allied to this one, which, I believe, maybe was involved in the above accident; that is the downdraft which is encountered on the lee side of obstructions. When you take up gliding you will finally become such an expert on air currents that you will even learn which side of a cloud to approach to get an updraft.

Alaska pilots soon learn to avoid the lee side of cliffs and mountains. The down-draft is so vicious in this area under certain wind conditions that you get smacked right down to the ground, despite anything you or your airplane can do.

Lots of things to remember, and lots of flight hazards in aviation, aren't there? But remember, a hazard recognized is half whipped; there then only remains to take the necessary avoiding action. The really sad cases are those which occur because of ignorance.

The best dog for sentry duty, the Marines have wryly observed, is the one that will stay at its post until properly relieved.

DID YOU KNOW?

Insignia, Medals, Badges, Awards

Rescuer of Rickenbacker Party Awarded Air Medal

The Air medal has been awarded to Lieutenant William F. Eadie, U. S. N., for his successful rescue of the Rickenbacker party on November 12, 1942, after they had been adrift in the Pacific since October 21.

WORLD WAR I: RICK AND FAMOUS SPAD PLANE

The citation accompanying Lieutenant Eadie's award reads:

"For meritorious achievement while participating in an aerial flight as pilot of a scouting plane in search of the survivors of the Rickenbacker party on November 12, 1942. Discovering their tiny raft after a search of more than 10 hours, Lieutenant Eadie, knowing that every moment counted after 20 days of hunger and thirst which these men had endured, brought his plane down on the open sea near the raft. Placing the most severely injured man in the cockpit of his small plane, and lashing the others to the wings, he taxied toward his base 40 miles way, until given assistance by a passing ship. His courageous and skillful accomplishment of this dangerous mission was in keeping with the highest traditions of the United States Naval Service."

FOR MERITORIOUS ACHIEVEMENT IN AIR FLIGHT

Observers' Insignia

It has been brought to the attention of the Bureau that many officers under duty involving flying as Technical Observers are wearing the Naval Aviation Observers' insignia. That is not in compliance with the Navy Uniform Regulations unless the Officer concerned was designated a Naval Aviation Observer after the completion of a duly prescribed course of instruction. The last officer so designated was designated about 1930. Orders to duty involving flying as a Technical Observer are not a designation as a Naval Aviation Observer.

Officers and men serving in flight crews will be eligible to wear an insignia made up for aircrews. Certain officers on duty involving flying as Technical Observers, such as navigators permanently assigned to air combat crews, will qualify for this insignia by the nature of their duties.

Air Crew Insignia

As a result of numerous recommendations from the Fleet, an Air Crew Insignia has been approved, giving recognition to the air-fighting ability of flight crews.

The insignia is intended primarily for enlisted ratings, but commissioned and warrant officers, other than those designated as naval aviators or naval observers, may be eligible to receive and wear it. Excluded also are enlisted ratings with the designation of naval aviation pilots.

The insignia is to be worn on the left breast. When worn with ribbons or medals, the Air Crew Insignia will be uppermost. A miniature, scale one-half of the original, is to be worn when miniature medals are prescribed.

The requirements for award of the Air Crew Insignia are as follows:

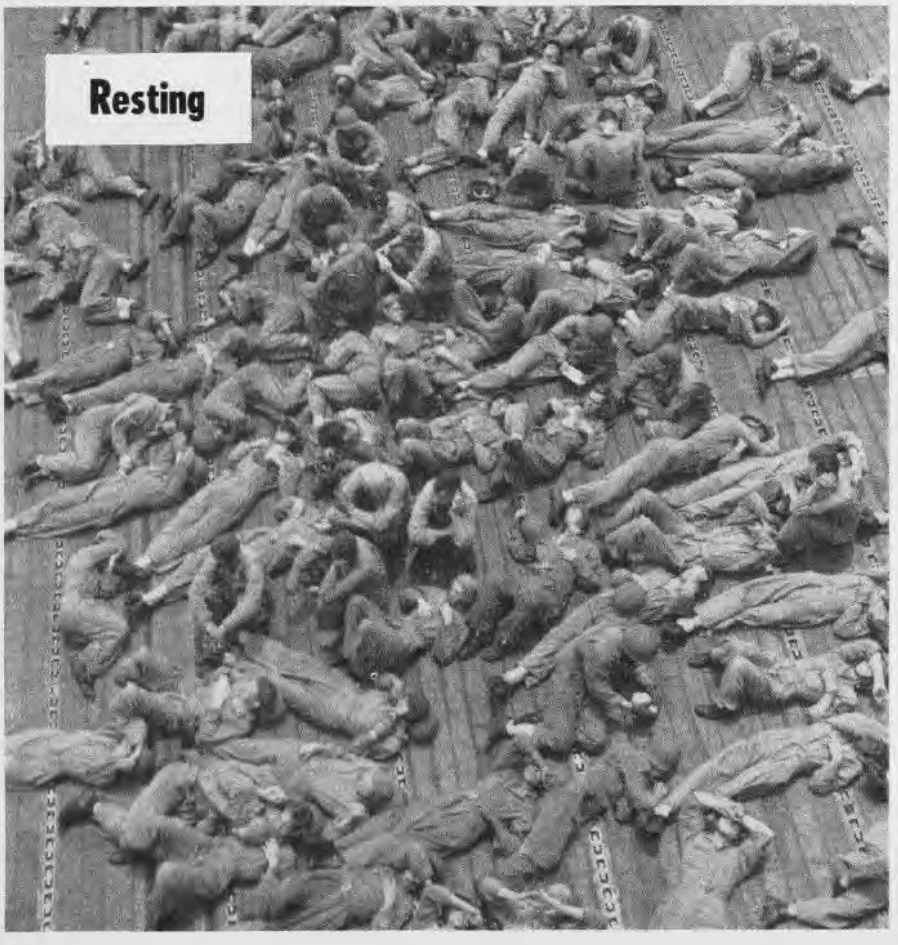
(*a*) Having served, subsequent to December 7, 1941, for a total period of three months as a regularly assigned member of the Air Crew of a combatant aircraft.

(1) "Combatant aircraft" shall be considered as all *operating* aircraft of the Fleet or Frontier forces, and excepts utility aircraft which are neither designed nor fitted out for offensive (or defensive) operations.

(2) The term "regularly assigned member of the Air Crew" shall be interpreted literally and shall be substantiated by the battle-station bill of the unit, under such instructions that may be approved and promulgated by the Bureau of Personnel.

(*b*) Having suffered injuries or other physical impairment, while engaged in combatant operations since December 7, 1941, as a regularly assigned member of a combatant aircraft, which precludes the possibility of fulfillment of the time requirements, stated in subparagraph (*a*) above, and is recommended by the Commanding Officer of the unit in which injury or physical impairment was received.

(*c*) Individual combat stars will be authorized by Unit Commanders in conformance with instructions issued



by Commander - in - Chief, United States Fleet, to those members of Air Crews who—

(1) Engage enemy aircraft, singly or in formation.

(2) Engage armed enemy combatant vessels with bombs, torpedoes, or machine guns.

(3) Engage in bombing or offensive operations against enemy fortified positions.

(4) A maximum of three (3) combat stars will be awarded for display on the Air Crew Insignia; combat action reports in excess of three will be credited only in the record of the individual concerned.

(*d*) Personnel, qualified by the provisions of subparagraphs (*a*) and (*b*) above, may wear the Air Crew Insignia permanently.

No definite date has been mentioned as to when these insignia will be available, but it is supposed that they may be looked for around the first of May.

Air Gunner's Badge

Giving recognition to the specialized training and battle stations of Air Gunners, the Secretary of the Navy has approved a distinguishing mark to be worn on the sleeve of qualified personnel.

The badge, which parallels the distinguishing marks already authorized for the Gun-Captains and Gun-Pointers of the batteries of combatant ships, may be worn by enlisted men who have successfully completed the prescribed course in Air Gunnery, or who have been qualified in accordance with approved standards.

The mark (a winged machine gun) is worn between the shoulder and elbow of the left arm for men of the seaman branch, and right arm for others. Vertical height for the mark should be approximately two inches.

Visitor: "I'm Mrs. Jones. I'd like to see my grandson who is on duty here."

D. O.: "I'm sorry, Madam, he's away on leave just now—attending your funeral."

25 years ago this month

Naval Aviation 1918

APRIL 1—The British Royal Air Service and the Royal Flying Corps have combined to form the Royal Air Force, the purpose being to have the British Naval Aviation reinforce Army aviation. Several missions were sent to Washington to point out the advantages to be gained if the United States would do likewise. Admiral Sims and General Pershing vigorously proposed this amalgamation.

APRIL 2—LTA Base at St. Trojan taken over by United States Navy, Commanding Officer, Lt. W. C. Griffith, U. S. N. Flight operations began August 31, 1916, using LaPru flying boats (French). Unable to obtain spare parts. Endeavored to replace French equipment with American.

APRIL 2—United States Kite Balloon Station at Castletownbere, Ireland, taken over from British under command of Ensign Carl N. Shumway, USNAF.

APRIL 10—LTA Base at La Trinite established with Ensign C. M. Johnson U. S. N. commanding. Scarcely completed before Armistice.

CABANISS FIELD, CORPUS, COMMEMORATES HIM

APRIL 15—Gunnery and Bombing School for United States Naval Aviation established at Moutchic. Commanding Officer, Commander R. W. Cabaniss, U. S. N. Established by French in December 1917. Instruction course best of all known systems. Became a practice to give all newly arrived pilots from United States course at this school to polish them up. From beginning until July 1, 1918, graduated 62 officer pilots, 12 enlisted pilots, and 49 enlisted observers. From July 1 to October 1, 1918, graduated 60 officer pilots.

APRIL 23—A German Submarine "Pennarch Pete" discovered and attacked with bombs from a seaplane piloted by Ensign K. R. Smith with Ensign O. E. Williams as observer. Pilot signaled the U. S. S. *Stewart*, which later destroyed the submarine. The French Government awards the Croix de Guerre to the crew of the plane.

APRIL 24—Lt. (j. g.) H. F. Guggenheim makes arrangements for Caproni bombers. Raw material was exchanged for these aircraft which eventually proved nearly worthless.

APRIL 25—Gas pressure of the nonrigid "Capitaine Caisom" under command of Lieutenant Commander Maxfield lost while on patrol off Quiberon. The blowers were unable to keep pressure up and the ship began to fall quickly. Threw all ballast overboard but ship hit water a complete wreck. Maxfield kept 2 members of his crew afloat until rescued.

Aid for the Airsick

NAS, GLENVIEW, ILL.—Tips on how to handle a sudden case of airsickness were given to student fliers at this station after it was observed that instructors were frequently taxiing up to the field office and coming to rest for several minutes, giving students time to overcome their "tummy" troubles.

Explaining simply that airsickness follows when the brain tires of decoding rapid movements in the air, *Exhaust*, the station's newspaper, made these suggestions on what to do when that feeling comes on:

"Adjust your seat as high as possible, so visibility will be perfect, fasten safety belt firmly so you do not bounce around, and keep your eyes out of the cockpit! This is important! Watch a point of reference far from the plane; a road on the ground, a railroad track, the horizon, etc. Avoid too frequent performances of the maneuver that made you ill. If very bad, stay upstairs until improved, because trying to land while dizzy is dangerous. Airsickness, common among new students, is found to be most frequent during warm weather, especially after repeated performances of wingovers and other acrobatic maneuvers."

BUREAU SAYS: If, in spite of the above precautions, you continue to experience this unpleasant malady, it is suggested that you seek the advice of your flight surgeon. To go up for acrobatics on a full stomach is to invite rapid emptying of the stomach. If you are hungry take a candy bar half an hour before flight. Coffee lessens the nausea.

Okay to Eat

Maybe it's just as well that your steaming cup of jamoke isn't as plentiful as it used to be. According to Lt. Howard R. Bierman (MC) U. S. N. R. of the Dispensary at NAS, Pensacola, it might not be a bad idea to replace the coffee kettle on board ship with a pot of chocolate.

It isn't rationing which brings up this old controversy once again, but an experiment made on the diets of thousands of aviators at Pensacola. Lieutenant Bierman found that coffee may help to cause mental confusion and trembling among high-strung individuals aboard ship during critical moments of battle.

One hundred veteran pilots were interviewed on the subject of aviator's nutrition, and the effects of different types of foods on several thousand aviation students were studied. Lieutenant Bierman found that:

(1) Aviators should be fed at least once every 4 hours while awake, not only to stave off upper-air hunger, but also because frequent feeding helps to keep the blood from becoming so unevenly distributed during aerobatics that the flier loses consciousness.

(2) Eating shortly before the take-off brings more blood to the stomach, preventing additional blood from rushing from the brain to the lower torso when the plane zooms up at the end of the dive.

(3) Gas-forming foods such as omelettes, cheap ice cream, frothed and carbonated drinks, beans, cauliflower, malted milks, and beer should never be consumed unless they can be digested long before flying is contemplated. (At 18,000 feet gas in the stomach expands to double its volume at sea level.)

When Abandoning Ship

If you ever have to abandon ship, these tips from a transport commander who has seen it happen, may come in handy. The crux of the

whole subject is that life-saving equipment often defeats its own purpose when improperly handled.

Lowering life rafts unattached, for example, frequently constitutes a hazard because some of the rafts hit men already in the water, while others are carried away out of reach. It is suggested that, instead, a line be attached to each raft and that one man from the ship's rescue squad, with two turns around the rail, lower and release it.

Jumping overboard with kapok life jackets also causes injury at times, for if the collar or top strings are tied, the impact of hitting the water may force the jacket upward and tighten the strings around the man's neck, strangling him.

Collar and top strings should be left untied to prevent this. In addition, if the arms are held down close to the body, the force is taken up under the arms and diverted from the neck. A better method, where possible, is to ease into the water by line or ladder at a point nearest the raft.

High-Flying Birds

Carrier pigeons are important little birds to the armed forces. They often are used to send messages from reconnaissance planes forced to keep radio

silence. One draw-back, however, has been the fact that the air at 10,000 feet, which is an operating altitude of such a plane, is too thin for the birds to fly.

As an answer to this particular problem, the Signal Corps has rigged up a canvas-covered wire cage. The carrier pigeon is placed in the cage and the cage tossed out. At a prescribed altitude, an automatic opening device frees the bird and the pigeon flies with the message to its home base.

Five-Ocean Navy

In his annual report to the President, the Secretary of the Navy has disclosed that the Nation's projected "five-ocean" Navy will be in active service before the end of 1945. The Nation's over-all ship production program was scheduled for completion in 1947, Mr. Knox reports, but accelerated construction has broken all previous records and the entire authorized tonnage, with the exception of several large units upon which work has been suspended due to material shortages and time requirements, will have been commissioned and placed in service before the close of 1945.

Reminder

All requests for aeronautical charts, navigational aids, and CAA publications, such as Weekly Notices to Airmen, Radio Facility Charts and Civil Air Regulations should be directed to the Hydrographic Office. This will eliminate unnecessary paper work and delays in the delivery of the material. This announcement is made as a reminder, inasmuch as the Bureau is still receiving these requests from newly commissioned ships and newly established bases.

V Mail Will Get It There

When you send a letter by airmail you want it to get there in a hurry. When you send any letter overseas you want to be sure it arrives. If you want to be *fast* and *sure*, send it by V Mail.

These are V Mail's two big advantages: it's fast because it has priority over all other types of mail; it's sure to arrive because the original letters are kept in this country while the V Mail copies are photographed on microfilm and sent out. If one V Mail is lost in transit, another copy of the letter is forwarded.

In the past couple of months, over 10,000,000 V Mail letters have been delivered, taking up the same space as 150,000 ordinary letters. That's V Mail's third big advantage (and its most important one): it saves cargo space for food, ammunition, and supplies. To give you an idea, here are some figures:

In January 1943:

61,202 pounds of air mail were transported by steamship from the West coast to the Pacific Islands.

8,149 pounds of air mail were transported by steamship from the East coast to England.

In February 1943:

25,724 pounds of air mail were transported by steamship from the West coast to the Pacific Islands.

4,429 pounds of air mail were transported by steamship from the East coast to England.

You will notice that less and less space is now being allocated for air mail. This entire two months' supply could have been transported by V Mail weighing only 1,500 pounds. Use of V Mail will permit air transportation for all air mail.

5 to 1—Navy & Marine Combat Score

Navy and Marine Corps airmen during 1942 destroyed approximately five enemy planes for every one of their own knocked down, according to

United Press reports based upon figures released by the War Department and by the Navy's Bureau of Aeronautics.

Most of the Navy and Marine Corps air victories were scored against Jap Zero fighters. In the Solomon Islands, the enemy has to date lost 876 planes. American plane losses in the Solomon campaign are approximately in the ratio of 1 to 5.

FLEET AIRCRAFT

PBY's in Brazil

FLEET AIR WING 12, ATLANTIC FLEET.—Recently a number of PBY–5(B)s were received from San Diego and ferried to South America by Flight crews made up of personnel of Fleet Air Wing 12 and Patrol Squadron 81. The big boats were sent to Brazil for use by the Brazilian Air Force.

The Brazilians had received some training in PBY's but not enough to man the planes on arrival and operate them. An officer was detained temporarily with a few men of Headquarters Squadron, and a few members of the ferry crews to set up a training unit in order to familiarize the Brazilian pilots and crews with the Catalina.

Facilities were somewhat lacking for the operation of seaplanes although ADP had recently completed a good ramp and parking apron. Several bumming expeditions to Pan American, Aviation Development Project and U. S. Army produced enough beaching tackle to rig the ramp and four buoys. A tractor was borrowed from PAA. A rowboat was available for a couple of days until PAA lost the only other one and then it was necessary to resort to paddling an outboard motorboat around during subsequent operations. Current in the river runs between 10 to 15 knots with an average tide of around 12 feet. Buoy float lines just wouldn't remain on the surface of the water when the current was running full. Finally 17-inch A–30 airplane tail wheel tubes were used on the float lines, one per line, compliments of the Army.

Training Begins

Training began almost immediately, planes securing to the buoys on the water for the first two nights until the ramp was rigged, and the beaching gear unloaded and put together. The Brazilian pilots picked up the air work rapidly and learned to make power landings, on the smooth water of the river on their first familiarization flights. Some training hops of three hours duration made as high as eighty practice landings, going up and down the length of the river, the wind hardly a factor to worry about most of the time.

With the arrival of the planes from the States, some of the other United States pilots took out the Brazilian pilots before they soloed the planes. The Brazilian plane captains were very adept at checking out in the tower, learning how to operate the APU and other equipment. The radiomen, however, were baffled by so much radio equipment. In one place, and only one, their expert, who could change frequency, was able to pick up enough information to operate all the equipment, including the RDF, before the training unit disbanded.

One of the American radiomen spoke Portuguese, which aided in getting information across to the Brazilian crews. Some of the Brazilian pilots and two or three men spoke some English and could understand, and this proved a great help in getting the word around to the others.

After all three first pilots had soloed, single-engine operation was demonstrated and the fliers were checked out on the Sperry Pilot, the operation of all the guns, the bombing circuits, and the intervalometer. Solo flights were then conducted with all guns in the ships, and partially loaded with gasoline and bombs in order that the feel with heavier loads could be acquired. A couple of the pilots successfully operated the planes with a full load of gasoline and bombs, making short four-hour navigation flights out off the coast.

Wind and Current

The water work with the PBY–5 was the hardest to teach, particularly with the river current and the wind being unpredictable. After the idea of the use of the sea anchor was understood, the pilots began to perfect their technique. Buoy catchers became quite good at hanging on until the engines were cut. The one redeeming feature about making the buoy was that there was plenty of room, and a miss just meant going around again or drifting up or down the river until one got the engines turning over again.

The Brazilian beaching crew functioned very well and their only handicap was their short stature for the varying depths of water. It was necessary to keep the boat standing by when the beach crew was handling a plane, in order to assist a man who got caught in the current and couldn't swim back to the ramp. Twice, a set of side wheels was lost at high tide, even though a line was secured to them and tended by a man on the ramp. When one man got panicky and started yelling for help, all hands would drop everything and go to his aid. Luckily, the beaching gear was recovered each time, when the tide changed.

In 2½ weeks of operations about 200 hours were flown. Each of three Brazilian first pilots averaged about 10 hours' dual and from 12 to 15 hours' familiarization with complete Brazilian crews aboard; four second pilots flew from 11 to 22 hours. All pilots had flights accompanying United States personnel on search and rescue flights and radio range calibration which gave them each an average total time of close to 30 hours.

There were no major mechanical or structural failures which grounded any of the planes—and few minor difficulties not within the capacity of the small unit to remedy. There was nothing in the way of spares, tools, or equipment to work with besides what came with each plane. The United States ordnanceman, with three Brazilian ordnancemen, installed all torpedo racks, rigged and hooked them up to carry bombs, loaded bombs on all planes, cleaned guns, and preserved all the ordnance equipment that was used for demonstration.

Participated in Rescue

During the training they participated in the search and rescue of three

Army P–40 pilots forced down in the jungles by bad weather, out of gasoline. Two of the pilots were picked up from a native boat on one of the canals in that region; and an Army salvage crew later was flown to the same locality and put ashore to salvage the P–40's. One of the pilots of the P–40's turned up 15 days later, having come in from the north shore of the Amazon by native boat.

The mighty, muddy Amazon is a sight to behold, with forbidding jungles on all sides, and is held in awe and respect by all who navigate it or its tributaries. Several flights were also made carrying United States Army and CAA personnel, to calibrate the radio range station soon to go into operation at this point as an aid to various ferry organizations.

Convert Mars Into Cargo Carrier

The Navy's patrol bomber Mars is being converted into a cargo vessel at the Glenn L. Martin Co.'s Baltimore plant and will soon enter the Navy's transport service.

The Mars, which has been undergoing tests for several months, has been stripped of her tactical equipment to provide room for heavy and bulky freight. Other changes provide for the installation of Wright Cyclone engines of more than 2,000 horsepower. A cargo version of the Martin PBM–3 patrol bomber is also being produced in volume.

Otherwise, A Quiet Day

Remember the old-time movie serials in which the hero escaped death one week by the skin of his teeth only to find himself worse off the next Saturday? Here's a report that packs a dozen Saturday episodes into one "quiet day". It comes from a navy pilot who fought in the North African campaign. He's now recuperating in Washington.

"I took off in a small observation plane of a new type and not too well known throughout the Navy. The good old ship U. S. S. ---------- promptly turned loose her antiaircraft batteries and smashed the plane on the first salvo.

"I bailed out at a rather high altitude to make sure of reaching the beach on landing.

"The French turned loose their pompoms at me while I was coming down and nicked me with shrapnel.

"I landed on the beach. While I was lying there nursing my wounds a half dozen Arabs rushed out of the bushes and threatened to slit my throat if I made a sound. Then they stripped me of everything but shirt and shorts. They seemed delighted over my clothes—especially my shoes.

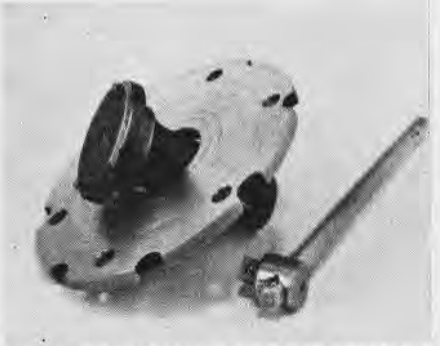
"I lay on the beach for hours and became badly sunburned. In fact, that did more damage than the shrapnel wounds.

"Finally a Navy launch picked me up and took me to a ship. I was strapped to a stretcher and the stretcher snapped to the deck. Shortly thereafter the ship was torpedoed. The stretcher was freed from the deck and I went overboard still strapped to it. I fortunately landed upright and floated around awhile until again picked up.

"Aside from all this it was a quiet day."

Improvised Tool

PATROL SQUADRON 73, ATLANTIC FLEET.—A special tool for removing and installing an accessory section generator oil seal, made in the machine shop of this Squadron, may prove valuable to every squadron engineering department that maintains R–1830–82 or 92 Pratt & Whitney engines.



TOOL FOR GENERATOR OIL SEAL INSTALLATION

During the first hundred hours after installing a completely overhauled engine, its accessory generator oil seal began to leak so excessively that the airplane was restricted to local flying. It was felt that the engine would have to be lowered from the aircraft in order to remove and reinstall the oil seal as the special Pratt & Whitney tools, numbers PWA–1575 and PWA–1361, were not available.

Dwight R. McGinnis, AP1c, who had previous machine-shop experience, made the tool shown in the picture. A 1½-inch socket wrench was softened by heating and removing the temper. With French machine-shop tools, it was milled down so the two nipples on the socket fit the slots in the generator seal and turned down to its present shape on the lathe. The tool was then heated and retempered. A piece of ⅝-inch armor plate was drilled and turned to fit the generator hold-down studs.

With this completed tool the worn accessory generator oil seal was removed and a new oil seal installed in one hour while the engine was installed in the aircraft.

BUREAU SAYS: This tool may be used satisfactorily on the R–1830's which have the generator oil seal held in place with a slotted nut. Not all R–1830's do. Unfortunately the R–1830 Overhaul Manual only specifies the tool used on engines which have generator oil seals held in place by a press fit. Dwight R. McGinnis, AP1c, is to be congratulated on his ingenuity in manufacturing this tool under the adverse conditions peculiar to this location.

Naval Photographic Squadron

FLEET AIR PHOTOGRAPHIC SQUADRON ONE.—This is the first naval photographic squadron commissioned and equipped as such, and it is now intended to bring the photographic "bacon" home in the combat area.

VD–1 is equipped to be self-sustaining, and that means really owning a lot of gear. The problems of obtaining such gear, especially advance-base equipment, are manifold. Hats are taken off to the Marines and their all-comprehensive "Table of Basic Allowances," which is a Sears-Roebuck catalog less illustrations of everything in the way of equipment.

All pilots are pleased with the PB4Y–1 airplane. Its performance, range, fire power, and stability make it an excellent and versatile photographic airplane. Naval Air Station, San Diego, did a swell job in modifying squadron planes for the special photographic equipment required, and was also of great assistance in ironing out various other modification and installation bugs.

New Method of Filling Brake System

SCOUTING SQUADRON 1–D12.—The two methods listed in the Erection and Maintenance Instructions for OS2U–3's have not been completely satisfactory in eliminating all air traps in the system. A new method devised by this squadron's chief aviation Machinist Mate E. L. Sutton, USN, has been used for a year with satisfactory results. Several other VSO Squadrons have borrowed this procedure.

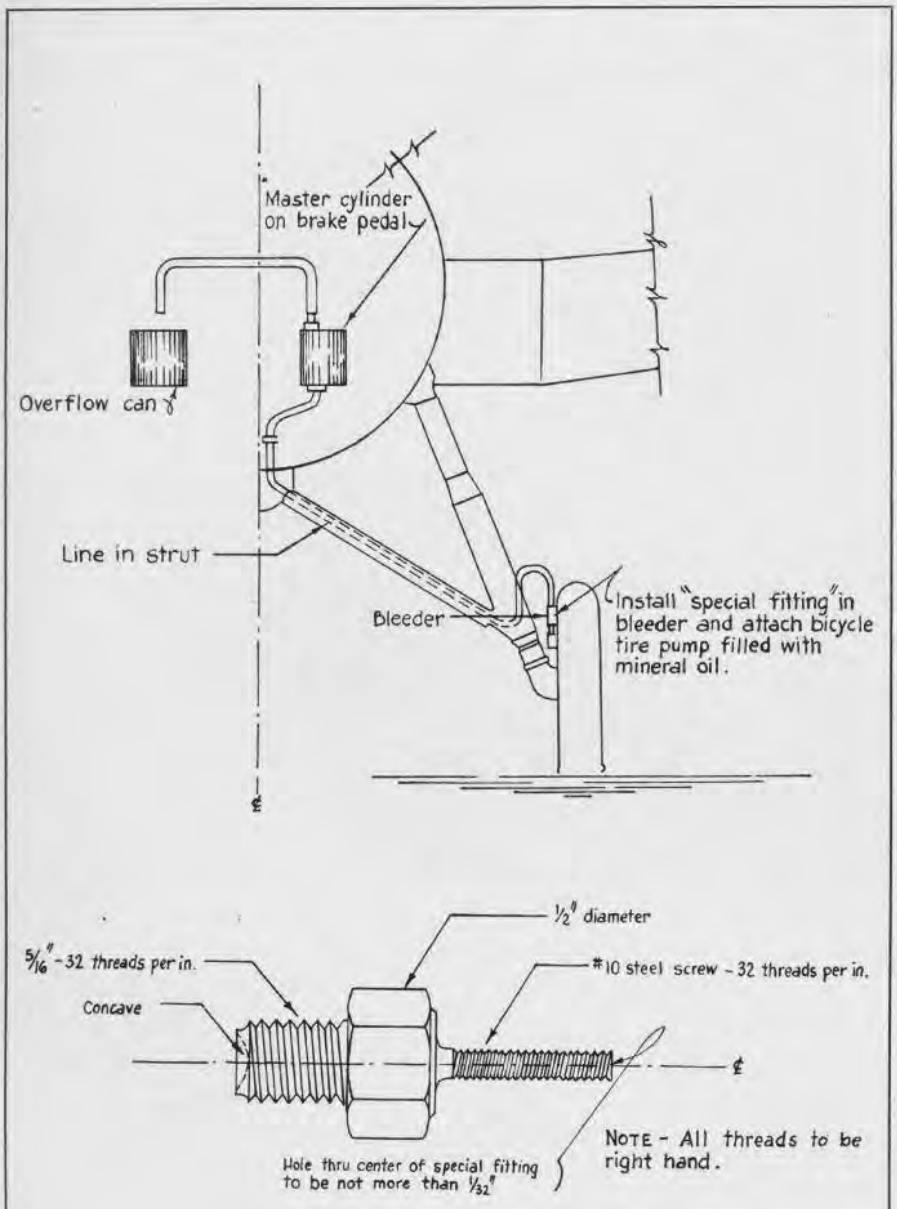
The additional equipment required includes a bicycle-tire pump and a fitting similar to the one shown in the drawing. First, install the overflow tube on the master cylinder on the brake pedal as shown in the figure. Remove the round head machine screw from the hexagonal head bleeder on the cylinder on the brake flange.

Install the special fitting in place of the round-head machine screw and attach to it the bicycle pump, which has had the plunger removed and the pump barrel filled with Navy Spec M–339 Mineral Oil and plunger replaced. Open the bleeder and force the pump handle down hard and run a sufficient amount of the fluid through the overflow tube to eliminate all air traps.

Be sure to use force in filling the system to insure that the air traps are forced up through the system. Maintain pressure on the pump and close the hexagonal head bleeder. Remove the pump and fitting and replace the round-head machine screw. Remove the overflow tube and replace the filler plug.

By filling from the lowest point with pressure, the air traps in the line are more satisfactorily eliminated.

BUREAU SAYS: This provides an alternative method of filling the brake system without incurring bleeding problems.



SPECIAL FITTING FOR FILLING THE BRAKE HYDRAULIC SYSTEM

Photographers Active

VD SQUADRON TWO.—The "eyes" of the Atlantic Fleet, its aerial reconnaissance cameras, are taking on new tactical meaning as a result of developments now under way in the Atlantic Fleet's aircraft photographic squadron.

Advanced techniques in high level and oblique aerial photography and mapping are being worked out in combination training and experimental flight work by flying and photographic officers.

In preparation for operations with the fleet, selected pilots from each squadron are given special advanced training in the technique of remote control fixed-camera photography.

Although the cameras are fully automatic and require no adjustment in flight, it has been found that the best pilots bring back the best pictures.

In addition to the squadron flying cameramen, technically trained photographic officers from the Navy's photographic school at Pensacola come to the squadron for advanced instruction and "checkout" in aerial reconnaissance work.

These officers become specialists in the most difficult, yet most strategically important of all photographic missions—that of penetrating the enemy's defenses, camouflage, fighter screens, antiaircraft, and bringing home the telltale pictures which give away his military secrets.

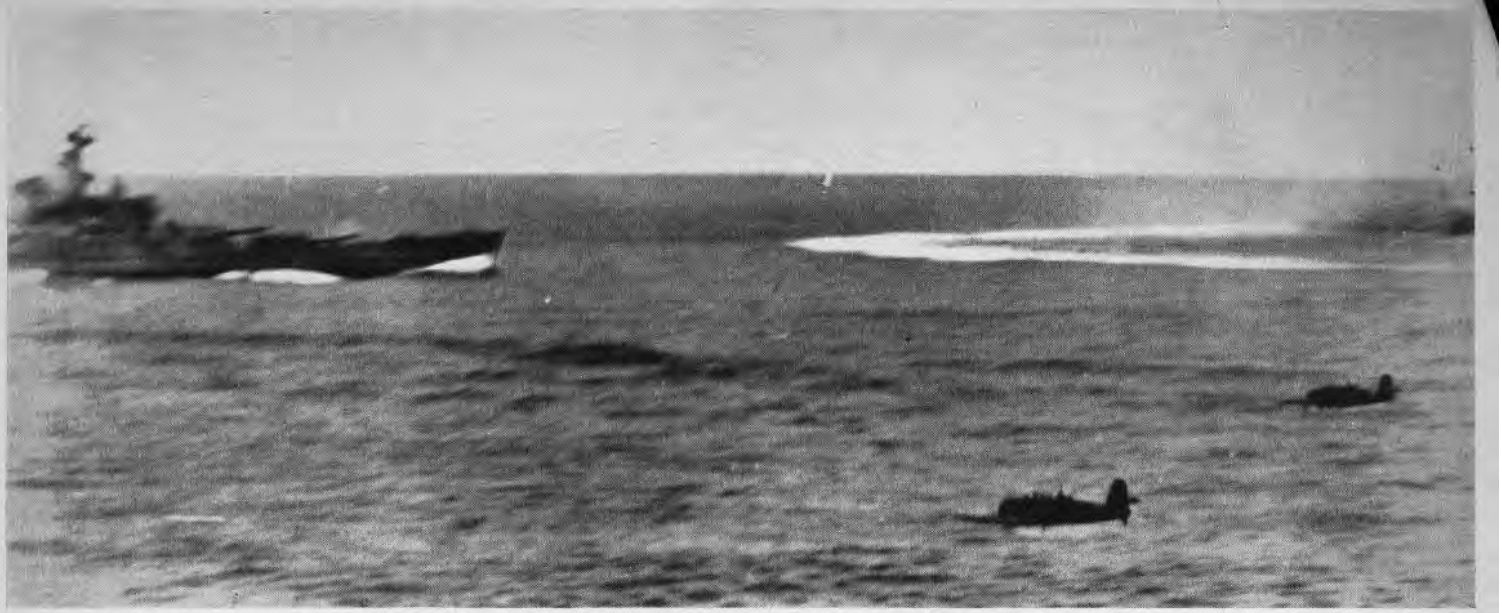
NAVAL AVIATION — A GLOBAL FORCE

THE extent to which Naval Aviation has become a global force is best exemplified in pictures. Because this war is being fought on every surface and in every element of the globe, habitable or not, planes of the Navy are required to be on active duty over virtually every water—and many land areas—from pole to pole.

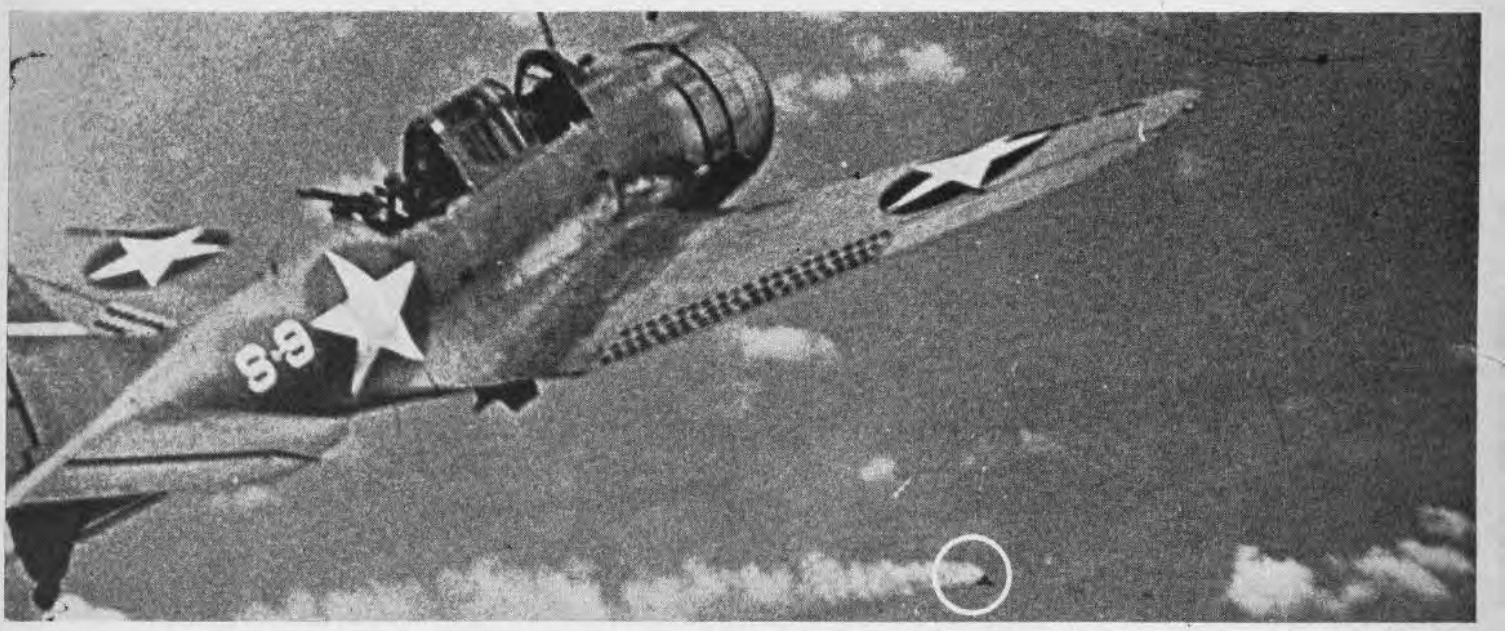
How is this significant? The Naval Aviator, let us say, takes up a new tour of duty at a naval air station that may be antipodally separated from his previous station. He is faced with diametrically different flying conditions. Climate, weather, temperature, light have become, paradoxically, constant variables that exert profound influence upon flying and upon all aerial warfare. For this reason, the Naval Aviator, today more than ever before, must be bountifully informed—the master of many sciences related to aviation.

No one realizes better than the Navy pilot how legion are the tasks of Naval Aviation in its global role. He knows that while he, alone and unassisted, can fly a plane and per-

(Continued on page 16)



IN AN ENGAGEMENT IN THE SOUTH PACIFIC TWO JAP PLANES FLY BETWEEN A U. S. BATTLESHIP AND THE CARRIER FROM WHICH THIS PHOTO WAS TAKEN



↑ SCENE DURING ATTACK ON JAP FLEET. BURNING JAP SHIP IS ENCIRCLED. ↓ DESTRUCTION OF TWO JAPANESE PLANES IN AN ENGAGEMENT WITH U. S.

NAVAL AVIATION

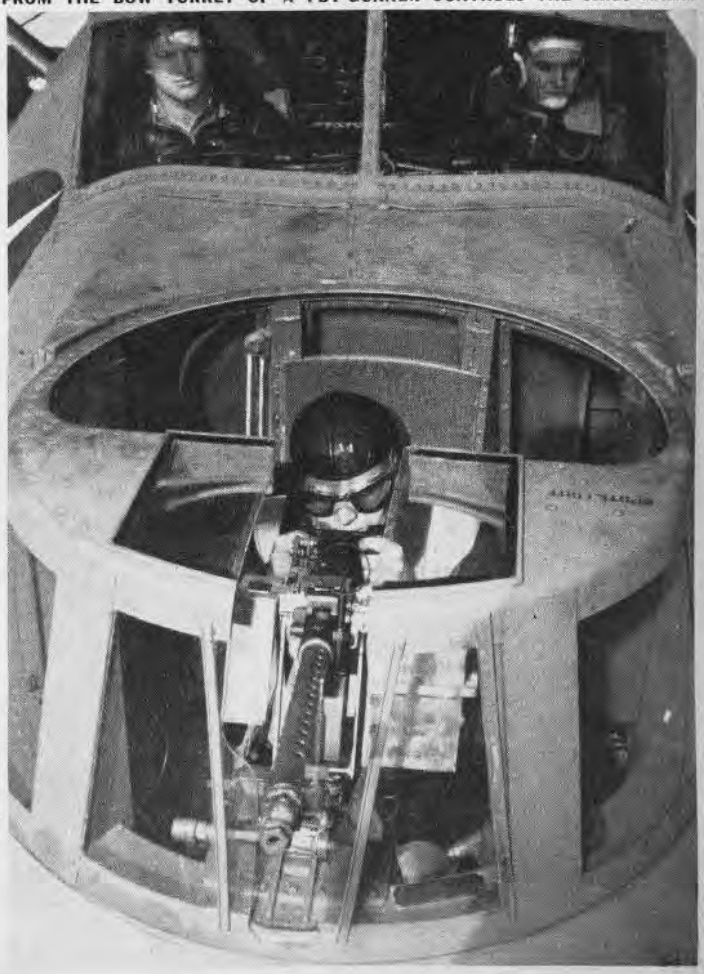
form the mission assigned to him, a large force is required to service that plane, keep it limber and in running order, so that it will function smoothly and well the instant it is needed.

NEWS LETTER'S photo section attempts to picturize the global character of Naval Aviation and, at the same time, to indicate the diversity of tasks its crew are called upon to perform. No matter how complete such a section might be, at best it can only skim the surface, so numberless and varied are the subjects that must be covered.

(*Continued on page 26*)

FLYING FREIGHTER. STOOD ON END, MARS' WINGS TOP A 20-STORY BUILDING

FROM THE BOW TURRET OF A PBY GUNNER CONTROLS THE SKIES AHEAD



— A GLOBAL FORCE

AT PENSACOLA AN INSTRUCTOR SHOWS STUDENTS
HOW TO HOLD AND HANDLE AN AERIAL CAMERA

DUNKING SENSE. SURVIVAL ON A RAFT REQUIRES A COMPLETE INVENTORY

WHILE STANDING BY, PLANE HANDLING CREWS WELCOME BATTLE RATIONS

GETTING CLEAR. TBF'S CARRY THEIR DEADLY MESSAGE TO THE JAP FLEET

PARAMARINES UPHOLD MARINE CORPS TRADITIONS IN AIRBORNE ATTACKS

TRAINING

Swimming is Stressed at Pre-Flight Schools

NAS, SEATTLE.—This station has received many requests for a description of its dummy submerged cockpit escape drill, used in the station swimming pool. Since early fall, when the drill was put into operation, many pilots and flight crews have received their first experience in escaping from a sinking plane.

The cockpit is of actual size, with a frame-work of wood surrounding a regular F4F seat, attached to which is the regulation safety belt. Metal weights are attached inside this frame-work to aid the cockpit in sinking as it slides down the runway, which runs on a slight angle almost parallel to the side of the pool. Four ropes are used to lower and raise the apparatus. (It is suggested that construction of cockpits be made chiefly of metal as, with the use of wood, considerable weight must be added to make the cockpit nonbuoyant.)

After an explanation and demonstration have been made, the student, dressed in full winter flight gear, life jacket, and parachute, with safety belt fastened, sits in the cockpit and is lowered to a six-foot depth. He then releases the safety belt and escapes to the surface. On the second attempt, the plane is lowered and tipped upside down at a ten-foot depth for the escape.

The pre-flight school at Chapel Hill also reports the use of this apparatus.

ESCAPE DRILL: CLIMBING ONTO DUMMY COCKPIT

It states that, in addition to escaping from the submerged cockpit, students also drill in helping mates onto stretchers, aiding the wounded, swimming with rifles above their heads, climbing up and down cargo nets, swimming under water with clothes on and practicing the tired swimmer's carry.

TEN SECONDS LATER: CADET RISES TO SURFACE

Upon reaching the surface, the parachute should be released and the life jacket inflated. Better water balance is gained by taking off the parachute, but it should be retained as it is buoyant and may have future value.

Participants give a hand signal if they are unable to release themselves so the operators may return the cockpit to the surface within a few seconds.

To make the drill more realistic, a swim of 100 to 200 yards in flight gear, after the escape, may be added. Other innovations are binding one or both arms to the participant's side or tying both legs together and, after the escape, having him endeavor to stay afloat for ten minutes or swim a short distance, simulating broken arms or legs.

Disarming Tricks

PRE-FLIGHT, IOWA CITY.—"Pull a knife on me," "Try to strangle me," "Pull a gun and try to shoot me," are the strange invitations being traded by members of the ship's crew at the Iowa Pre-Flight School.

Bloodthirsty? No; the men are just looking for a chance to practice the disarming tricks of hand-to-hand combat taught in a special evening class by Lt. Wes Brown. So popular is this intimate form of combat instruction that cadets beg for more after the regular periods are over.

Training Officers for CV's and Advanced Bases

Numerous requests have come to the Bureau of Personnel from carriers and advanced bases for officers qualified to set up and conduct certain phases of training in those ships or activities. Qualifications for this type of duty are (1) graduation certificate from the Free Gunnery Instructors' School, Naval Air Station, Pensacola, (2) familiarity with use and maintenance of gunnery synthetic devices, (3) ability to conduct courses in recognition training using approved method of high-speed exposures, and (4) at least 6 months' experience in a recognized training activity.

Training activities will be requested from time to time for the nomination of officers who meet these requirements. Officers who desire this type of duty should make early effort to meet the above requirements.

Recognition

Requests for equipment, slides, projectors, manuals, devices, etc., should hereafter be sent direct to the Chief of the Bureau of Aeronautics, attention: Recognition Section, Training Division.

The custom of directing these requests to the Officer-in-Charge, N. T. S., Ohio State University, to Dr. Samuel Renshaw, Ohio State University, or to individual officers on the staff of the school is to be discontinued as it has frequently resulted in confusion and lack of coordination. Repairs and replacements, however, can be ordered from the Bureau of Aeronautics Liaison Officer, Ohio State University Research Foundation, Columbus, Ohio.

The following units, who have trained instructors of Recognition available, are entitled to this equipment: Regularly established Naval

Air Training Schools, Naval Air Stations, Fleet Air Wings, CV's, ACV's, AV's, patrol squadrons, Carrier Groups.

Operational List of Aircraft and Surfacecraft

Early in April, an official Operational List of Allied and Enemy Aircraft and Surfacecraft, which has been jointly accepted by the Army and Navy, will be distributed through the regular channels. Instructors should be guided by this list in teaching Recognition, taking special notice of aircraft type names and ship classes. The list will be revised periodically to keep pace with tactical and operational changes in the use of planes and ships by the listed nations. Planes and ships of the following nations will be included: United States, Great Britain, Germany, Japan, Italy, and Russia (Aircraft only).

United States Ship Changes

Because of major structural changes, the general appearance of the following United States Ship Classes, has been radically altered and current recognition material on these ships is obsolete: BB: Pennsylvania, Nevada, Colorado, Tennessee, New Mexico. DD: Porter, Mahan, Old Flush-Deckers (4 stackers).

Additional changes are now in progress or are projected for the near future on other ships, and will be sent, as they develop, to all recognition instructors. Ships listed above should be removed from the teaching courses and material on these ships set aside until new slides, pictures, etc., can be distributed.

New Pictorial Manual

A new Recognition Pictorial Manual, published jointly by the Army and Navy with valuable advice and technical assistance from the British, is currently on the presses and will be ready for distribution early in April. In its initial form it will be made up solely of Aircraft, covering almost the entire operational list of the major warring nations. Coverage of each plane will include the three familiar silhouette views, architectural renderings, actual photographs in flight, general statistics, recognition characteristics, and a short general interest story. A glossary of recognition nomenclature, a brief outline of the problems of recognition, and a short description of the methods of teaching recognition comprise the editorial introduction.

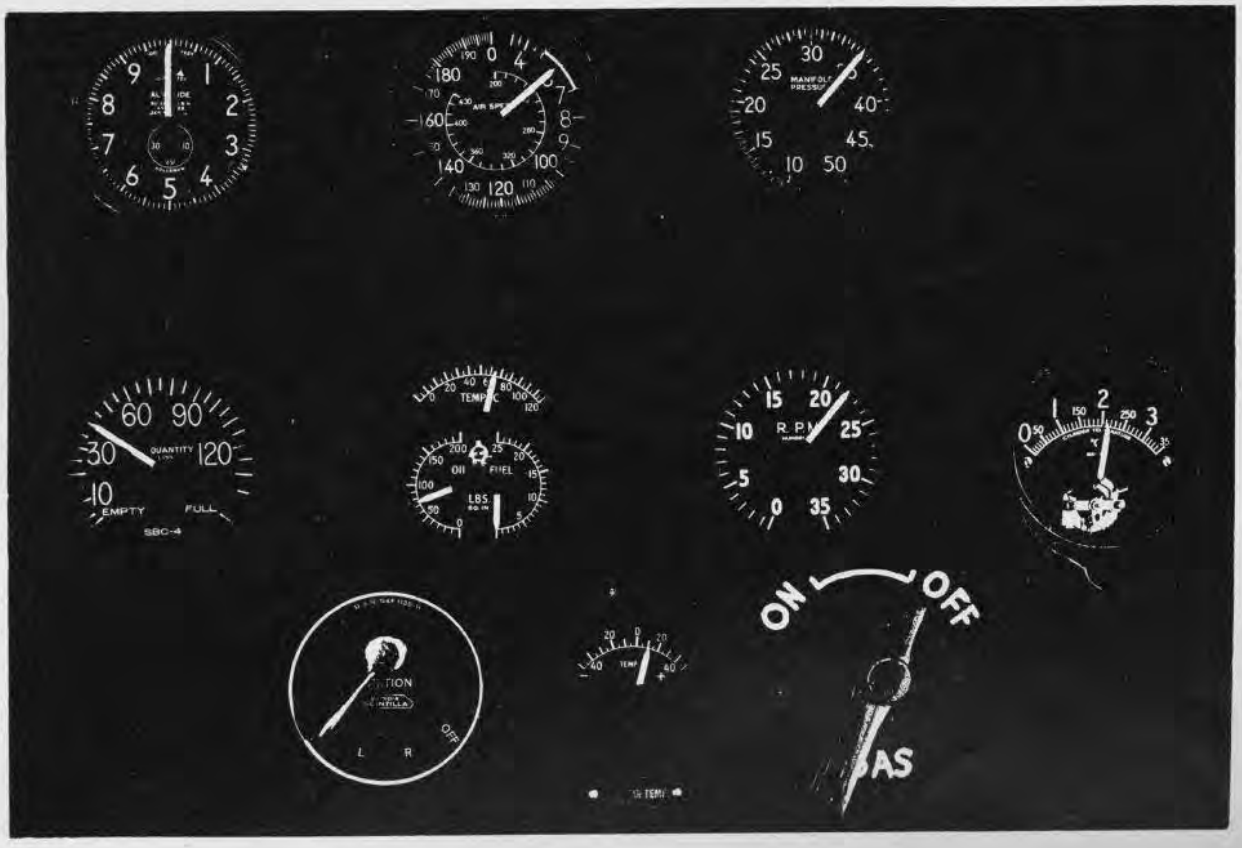
V-12 Training Program

A new Navy college-training program, absorbing most of the students now attending college with enlisted reserve status or with probationary commissions, will be inaugurated

What's wrong with this picture?

(*Answer on page 32*)

You should be able to detect the trouble at a glance. If not, turn to page 32 for the answer. Thanks for this picture, first of a series, are due the Naval Air Station at Oakland, Calif., where these dummy instrument panel boards are used to snap up cadets' cockpit consciousness. Visual instruction, where possible, is surest and quickest method.



about July 1st with the enrollment of students to be selected from examinations to be given early in April. The new V-12 program leading to a Naval Reserve commission is open to qualifying enlisted men of the Navy, Marine Corps, and Coast Guard, as well as recent graduates of high schools and preparatory schools. All students accepted for training will be ordered to colleges under contract to the Navy and go on active duty in uniform under military discipline. They will be rated as apprentice seamen, United States Naval Reserve.

Cadet Discipline

NAS, GLENVIEW.—Discipline still is a strong part of naval aviation training, as exemplified by these penalties which may be invoked against cadets at the primary flight training school at Glenview, Ill.

Offense: Dangerous flight conduct.

Penalty: As recommended by Aviation Training Board (based on seriousness). Twenty-five hours' ramp duty, 25 demerits, and permanent restriction.

Offense: Absent over leave or liberty 1 to 2 hours.

Penalty: Ten hours' ramp duty, 10 demerits, and 30 days' restriction.

Offense: Absence unauthorized from flight line or ground school class.

Penalty: Six hours' ramp duty, 6 demerits, and 2 weeks' restriction.

Offense: Use of profane language.

Penalty: Four hours' ramp duty, 4 demerits, and 1 week's restriction.

Offense: Clothing, gear, or property adrift.

Penalty: Two hours' ramp duty, 2 demerits, no restriction.

Flight Instructor's Training

A–V(P) and A–V(T) officers who are to be finally designated as naval aviators before their assignment as pilots in the aeronautic organization will follow procedure that has been laid out by the Bureau of Naval Personnel.

All personnel from the Navy CAA–WTS flight instructors schools are to be sent to the Naval Air Station, New Orleans, for the instructors course and for designation as naval aviator. From there they will be sent to duty at Primary Flight Training schools.

All other A–V(P) and A–V(T) officers whose first tour of duty is primary instructing are to be sent to brief courses of naval flight training at a Primary Flight Training school, for ground instruction and flight training as necessary. After that, they will take the primary instructors' course, NAS, New Orleans, for designation as naval aviator and further transfer to a Primary Flight Training school.

All A–V(P) and A–V(T) officers whose next duty will be other than primary instructing will be sent to an Intermediate Training Center for a brief course in naval flight training and designation as naval aviator, as in the past.

Naval aviators or naval aviation pilots previously designated and who require refresher training will be sent to an Intermediate Training Center for requalification.

Dunking Sense

The need for more attention to life-saving equipment was recently emphasized by a "dunking" case reported to NEWS LETTER.

A pilot was forced to land in the water in a combat area. He reported his plane sank so fast that he never saw it when he surfaced. The plane's raft functioned perfectly but the pilot was so handicapped by his chute and gear and the current was so swift that he couldn't catch it. However, he opened his seat-pack boat and climbed in. During the process, a nail in his shoe tore a hole in the fabric and he was forced to patch it, which he did successfully. During this time he lost his emergency rations.

Upon taking stock of his gear he found that his flares were useless, the first aid kit not in good shape, the match case held fish bait and no matches, there was no compass, the knife was all rusty so that it was impossible to open, and he had no canteen.

Fortunately he had five vials of chlorine. Every time a shark made a pass at the boat, the pilot used a vial to drive him off with considerable success.

Summing up the above, all changes suggested by the pilot are essentially covered in the new equipment. His suggestion about chlorine has been under study. Several publications cover rafts and dunking, the principal one being *Dunking Sense*, issued by the Bureau of Aeronautics. As these continue to be distributed, the need will be remedied.

However, it must be strongly pointed out:

1. That ground crews should inspect the rescue gear furnished with planes.
2. That pilots and aircrews inspect their gear as a check on the above.
3. That pilots and aircrews learn and practice dunking drill.

No equipment however efficient and no instructions however thorough can do it all themselves. Drill and inspection are the master keys to safety.

AAF Training Longer

A complete revision of the Army aviation cadet program extends the period of training for cadets from 8½ to 15½ months.

The training periods of the new program are as follows:

(1) Two months of basic training.

(2) Five months of academic study on college campuses. The cadet takes 180 hours of physics and 60 hours each of modern history, English, geography, mathematics, and trigonometry.

(3) Successfully completing his college course, the cadet is sent to the AAF classification center to determine his fitness for being a navigator, bombardier, or pilot. Then he is appointed an aviation cadet and receives advanced flight and academic work for another 8 months.

Full Stall (6 feet up)

"KNOW YOUR SHIPS . . .

AND I'LL KNOW MINE!"—Dilbert always said

1 When Dilbert won his Navy wings, nobody in the world was impressed—except Dilbert.

2 He was "a pilot after a fashion" and knew shapes—but of course not ships or planes.

3 One day Dilbert spied a ship cruising and flew toward it. He didn't know it was a Jap.

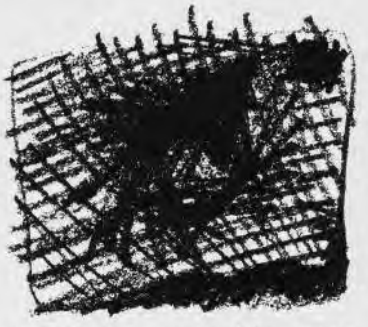
4 "One of our destroyers," he mused. "I'll just jaunt through a few maneuvers for 'em."

5 Dilbert was going along grand with slow rolls & things, until he flew into a wall of flak.

6 He fumbled for the stick and pulled out, then took refuge in a cloud, staying there an hour.

7 Mustering courage, he peeked out and, below, beheld a carrier. "Another Jap!" he hissed.

8 Dilbert gritted his teeth. He kicked her over and headed in for the kill, his guns blazing.



9 Suddenly everything went black. Dilbert came to, in the drink, minus a good plane.

10 Wet, broken and limp, he was hauled aboard a ship and sprawled over the deck to dry.

11 He heard a chorus of angry voices. They were American, not Jap. Dilbert was overjoyed.

12 But not the voices! They wanted to poke the wise guy who shot at his own shipmates!

Aircrewmen Take Ground Training

NAS, SANFORD.—The aircrewmen in the Ground Training School at this station are receiving instruction in engineering, radar, radio and communications, gunnery and miscellaneous topics related to aviation training. The program requires eight weeks of classroom and practical instruction.

More Attention to Free Gunnery

The following opinions on the importance of free gunnery have been expressed by experienced combat personnel:

1. The art of handling a free gun or turret effectively is as difficult to master as the art of flying an airplane.

2. No existing training program does more than cover the early stages of an air gunner's schooling. If thoroughly competent gunners are desired, constant training must be arranged for.

3. Meagre references in combat reports indicate that insufficient attention is paid to the air gunner and his training experience.

THERE'S NO ANTIDOTE AGAINST A GOOD GUNNER

It has been felt by some that the importance of the free gunner is far from being fully appreciated. This condition rarely continues after a unit has been in action, for a gunner's ability immediately assumes great importance when the Zeros start attacking. This is, unfortunately, a late hour to recognize the importance of good gunnery, or to do anything about it.

Considerable time and training are required to develop an air gunner to a degree of skill that will spell "poison" for enemy fighters. The problem confronting the rear-seat gunner is a real one, and pilots and responsible officers of multiple place aircraft squadrons are urged to become thoroughly acquainted with it.

Voice Training for Free Gunners

NAS, PENSACOLA.—The suggestion of the Naval Air Station, Kaneohe Bay, T. H., regarding voice training of student free gunners is soon to be carried out. At Pensacola 3A-2 trainer rooms are arranged in groups of four. Each room will be connected to a circuit controlled from a central point.

The gunners will wear ear phones and throat mikes. They will make pertinent reports to the controller who is the simulated pilot, such as: "Being attacked from port quarter"; "Bandit shot down"; "Two bandits coming up astern"; etc. The controller will acknowledge and note deficiencies of technique.

A similar arrangement will be used in the turret shed where the training turrets will be similarly wired and controlled. This training is necessary for the advanced firing at Gulf Beach moving-target range where turrets are used. Control of fire is difficult to exercise without proper voice communication. By using the turret and 3A–2 time for this additional purpose, the course of instruction is not lengthened.

Airbomber Training Unit

NAS, JACKSONVILLE. — An Airbomber Training Unit has been established at this station to train navigator-bombardier student officers in all phases of horizontal and glide-bombing. The SNB–1 is used for instruction and all piloting is done by naval-aviation pilots. In addition to attending the various pre-flight schools, officers under instruction have previously completed an 18-week course in Navigation at Hollywood, Fla., where they were commissioned Ensign A–V(S) and designated technical observers. Upon the completion of 12 weeks of instruction these officers will be assigned to active duty as navigator-bombardiers.

Knows 'Em All

PRE FLIGHT, ATHENS, GA.—Cadet D. C. Ring didn't know one airplane from another before joining the V–5 program, yet he's never missed once in N & R.

Instructors report he's made a total of 520 identifications in classroom tests—and every one correct. And if it weren't for the fact that Navy men never gamble, they'd lay you 8 to 5 that Ring's record won't be equalled.

The identification instructor attributes Ring's extraordinary faculty to a photographic mind. Anyway, it CAN happen here.

New Commands to Supervise Training

Operational Training Commands have been established under both the Atlantic and Pacific Fleets to supervise operational training of crews being assembled for new construction and conversion, training of those ships after commissioning, and periodic refresher training for crews of operating vessels.

Headquarters of these commands are now located at Naval Operating Base, Norfolk, and Destroyer Base, San Diego, respectively.

Dear Folks

NAS JACKSONVILLE.—A Recognition instructor at this station who claimed he was too tired to write an ordinary letter home to the folks apparently could muster the energy to disburden himself of the news in this touching ballad:

With my sleepy disposition
And my mind on Recognition
I have little time to write
And less to say. We are well
And doing fair, you may say
We have no care as we've learned
To manage things the Navy way.

For a time we had athletics
(Some might term it apathetics)
With the idea that the men be
Trim and fit. I was whipped
Into a coma and ate twice as
Much as home and I found that
My ambition is to sit.

I hope you and all are well
And that Fido's doing swell
And of coal and tires and
Gas you have enough. Since
I'm pressing to be funny, love
And kisses, send more money,
And I'll write again when I
Have learned more stuff.

SHORE STATIONS

Better Use of Maps

NAS, SANFORD.—A new technique has been developed at this station in the use of the 1AA Instrument Link Trainer. It has been found that a sheet of glass can be laid upon the top of the operator's table, over the map or chart to be employed in the training "flight." The "spider" traces the course flown upon the glass, rather than directly upon the map or chart. After completion of the flight and study of the trace by student and instructor, the trace can easily be removed from the glass by means of a cloth moistened with solvent. Expenditure of the map or chart is thus avoided.

This technique makes it practicable to use genuine maps and charts of the kind actually employed in operations since the same map or chart may be used repeatedly without being damaged in any way.

It also effects a substantial saving of time when training in cross-country instrument flying. This is accomplished by placing under the glass a sectional chart, or even a regional chart. At the point of destination a large scale chart of the landing area is placed under the glass and on top of the sectional or regional chart. The reduced scale of the sectional or regional chart condenses into a much shorter than normal time the cross-country portion of the "flight," but when the destination is reached the large scale chart of the landing area automatically comes into use and the "let-down" requires the time normally involved.

Magazine Maps for Charts

NAS, PASCO, WASH.—National Geographic Magazine maps have served as navigation charts twice when the chance to escape came to men trapped on Jap-occupied islands.

Last spring a group of British sailors escaped from Java to Freemantle, Australia, in a small sailing vessel. It was not until the boat was several hours at sea that it was discovered there were no charts. An old copy of the magazine with a world map in it was found on board and served for the navigation of the 2,000-mile trip.

Earlier, two American officers began a 159-day voyage in a small boat with nothing but magazine maps and compass. They succeeded in getting through to Australia despite enemy patrols.

Beating the Bog

MARINE GLIDER GROUP 71, EAGLE MOUNTAIN LAKE.—Prompted by an item on the swamp buggy appearing in the March 1 issue of NEWS LETTER, this Marine Corps station publicizes its own "magic carpet"—a contribution to the science of rescuing personnel marooned on muddy terrain.

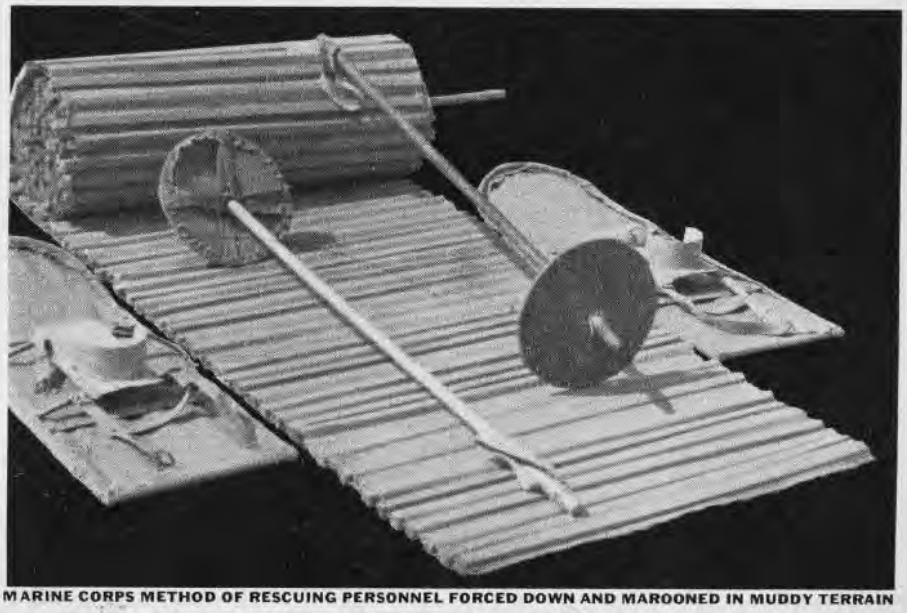
Designed by Technical Sergeant (now Marine Gunner) Otto C. Vieweg, U. S. M. C. R., the swamp rescue gear consists of canvas strips 30 feet long and 3½ feet wide, with 1-inch-square wooden strips secured every 3 inches. Under test, this device supported three men on land that would not permit walking. The carpet can be rolled into a compact bundle and is believed to be very useful as part of the equipment of a rescue plane.

Mud shoes of canvas on a steel tube frame also were made, providing adequate support for a man on fairly muddy ground. Each shoe has an area of about 2 square feet.

Weather-Board Man

NAS, DALLAS. — The Dallas aerological office is using an hourly weather-board map which has called forth much favorable comment from ferry pilots. A composite picture of the current weather within the territory covered by the hourly teletype sequence is quickly revealed mainly through the use of colored chalk. The blackboard is erased at the start of each sequence and entered in colored chalk as described in the key on the following page. The entire station is entered in the basic color for contact (white), instrument (yellow), or closed (red) conditions, weather determining, except any form of precipitation and that is always green.

One board alone is not adequate as it allows no comparison. By placing two identical boards side by side, it is easy to compare the present weather with the past. The size of the board is a variable factor; amount of wall space available, radius desired, et



MARINE CORPS METHOD OF RESCUING PERSONNEL FORCED DOWN AND MAROONED IN MUDDY TERRAIN

cetera, will regulate the size; but a scale of four inches equalling one hundred miles seems ideal.

Extreme flexibility is obtained by permitting any desired information to be recorded or changed. Fronts can be drawn in with their appropriate colors and followed simply and accurately, route forecasting is readily accomplished, alternate airports are easily spotted, and many other advantages are present that can only be realized after using this system.

The station circle is the size of a dime and divided in half to allow entry of the amount of sky coverage for two layers of clouds. The corresponding height of the cloud deck is entered in hundreds of feet to the right of the station abbreviation. An ordinary pencil sharpener will sharpen chalk satisfactorily for neat figures. Icing conditions as reported by pilots can be entered above a station with the altitude included. It might prove desirable to enter the cloud symbols on the three-hourly reports.

Station circles are painted white, abbreviations are yellow, and state boundaries red. Accepted CAA airways and radius circles may also be drawn in.

What, No Hula?

NAS, Barbers Point, Oahu, T. H.—In a setting of coral, kiawi trees, and sugarcane, officers and enlisted men, assisted by civilian contractors, are constructing a new Naval Air Station at Barbers Point, not many miles from Pearl Harbor. Naval personnel selected for the task have been joined by veterans of the Southwest Pacific area.

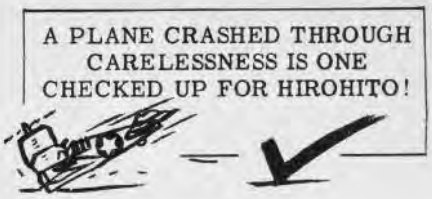
The climate is reported to be so balmy that Miami and Los Angeles would be proud to claim it for their own. However, men with orders reading Barbers Point should disregard pictures of Hula girls in any Oahu literature and thereby spare themselves disappointment, the station sardonically comments.

In Bad Company

NAS, Bermuda.—A recent incident which might easily have resulted in a tragedy has given one pilot cause to choose more carefully the planes with which he flies in formation. While engaged in night flying exercises, he saw what he believed to be the two planes he was to rendezvous with. He took his position at one wing and held to the course of the "leading plane."

Suddenly he discovered that the course he was flying would lead him directly over an antiaircraft range. He frantically called the leading plane to inform him of the mistake that was being made. The leading plane answered up from some miles away to tell him that he was nowhere near the range and to ask him when he was going to join.

Imagine the embarrassment of the pilot when he learned that he was flying in a formation made up of himself, a towplane, and a towsleeve with a light on it, and that he was headed over the range for a workout!



Training at Peak

NAS, Lake City, Fla.—Operational training at Lake City is now approaching a full operational status, with all instructors rapidly completing their PV–1 check-out. Operations were retarded to allow the ferrying of PV–1 planes from the West Coast. Experience gained from ferrying has gone a long way toward producing more experienced instructors in the PV–1 plane. Some of the ferry pilots had never come in contact with extreme icing conditions or sub-zero ground operating temperatures. Pilots report the PV–1 airplane to be the answer to an airman's prayer. Single engine approach to strange fields did not worry pilots or interfere with a normal landing.

One of the difficulties encountered was the freezing of the battery solution due to run-down batteries. The oil dilution system proved its worth many times. Pulling the propellers through 30 to 40 times added much to the pre-starting operations for a successful first start under sub-zero ground temperatures.

Ferry pilots of Lake City wish to send Army Bases the "Well Done" for service. As soon as planes landed they were gassed and serviced even at the expense of removing parts from

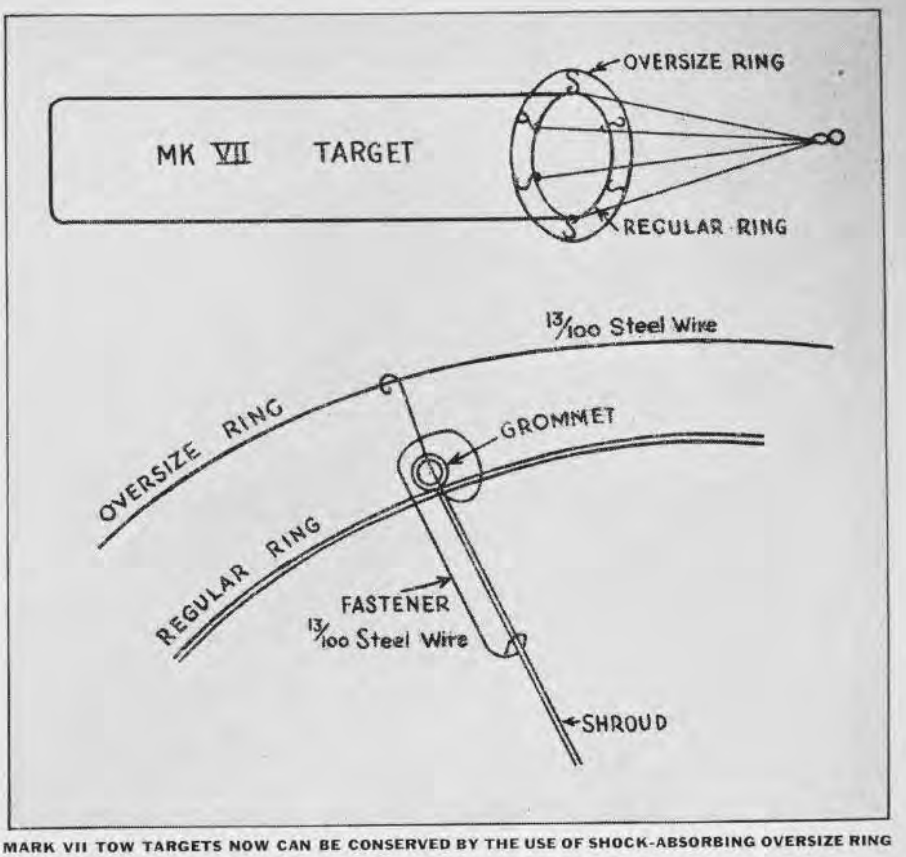
What's Cookin'?

Conserving MK VII Tow Targets

NAS, Fort Lauderdale, Fla.—In order to conserve MK VII tow targets, A. E. Bell, AOM3c has devised an oversize ring for the throat of the sleeve that has materially reduced the number of torn sleeves, parted shrouds and collapsed rings. One target has made fifteen take-offs and is still intact.

The principle is that of a shock absorber. The oversized ring which is made from $^{13}/_{100}$ steel wire is apter than the ring in the throat of the proximately 8 inches greater in diamesleeve. Secured to the smaller ring by fasteners thru the grommets it serves to keep the target from scraping the runway in pull-off from the field.

As the $^{13}/_{100}$ steel wire is hard to get the gunnery department uses the rings from the throats of old targets. Cutting the ring to increase the diameter leaves a space in the circumference, but this does not materially reduce the efficiency of the idea.



MARK VII TOW TARGETS NOW CAN BE CONSERVED BY THE USE OF SHOCK-ABSORBING OVERSIZE RING

Army aircraft. Transportation was always provided between planes and living quarters.

Killing Two Birds

Chapel Hill Pre-Flight.—Business is served with pleasure at this naval aviation training school as the pre-flight cadets learn lessons in communications and get the war news at the same time. Here's how it is done.

When the news commentators narrate the happenings of the day for radio listeners in North Carolina the cadets are at evening chow. A stenographer takes down the news in shorthand, then transcribes it and types the material. An hour later, when the cadets have returned to their rooms, a radio man taps out the news in code. An amplifying system carries the codified news to the cadets over the entire station. Those who can de-code get the news; those who can't miss out.

The Dope's Award

NAS, Oakland, Calif.—As a means of correcting stupid errors and a repetition of them, this station employs the ridicule method. When a student persists in making the same mistake time and again, he is ceremoniously awarded the "Donkey Ears."

The rite is performed by the chief flight instructor, who calls the AvCad to his office and advises him of the great distinction that is about to be conferred.

The Donkey Ears are leather strips sewed to wires and affixed to each side of an aviator's helmet. The student wearing the helmet is required to remain in a conspicuous place for a stipulated period of time.

When carelessness has resulted in the student's failure to attend a scheduled flight, the cadet wears, in addition to the ears helmet, a mammoth pair of horn-rimmed spectacles. For this offense he must sit for an hour gazing steadfastly at the flight board.

Low Pressure Chamber

NAS, Seattle.—Routine operation of the low-pressure chamber recently installed at this station was inaugurated shortly after the first of the year. A number of test runs had been made late in 1942, with Commander Leon D. Carson of the Bureau taking the first "hop" to a height of 42,000 feet.

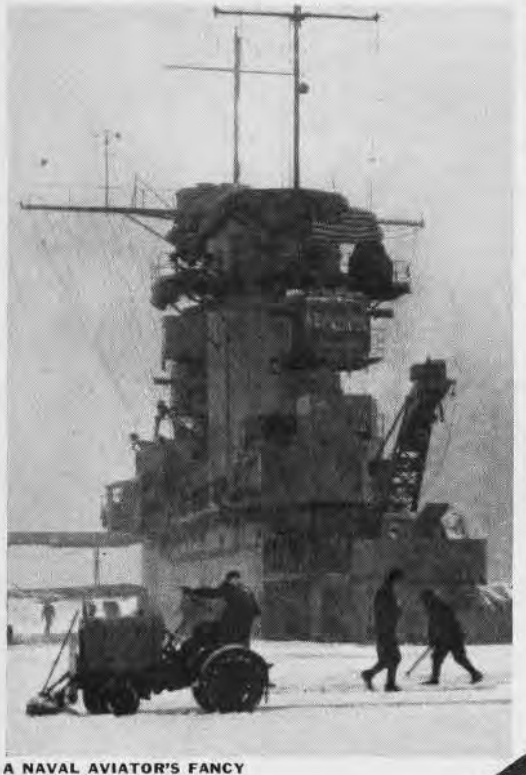
The chamber, an 8-man tank similar to those recently installed at Quantico, San Diego, Quonset Point, and several other stations, is under the supervision of the senior medical officer of the station.

The station's officer personnel have evidenced great interest in the new unit. A number at their own request have been either indoctrinated or reindoctrinated, while, under the station's general training program, all others are being run through the chamber.

(Continued from page 17)

NAVAL AVIATION— A GLOBAL FORCE

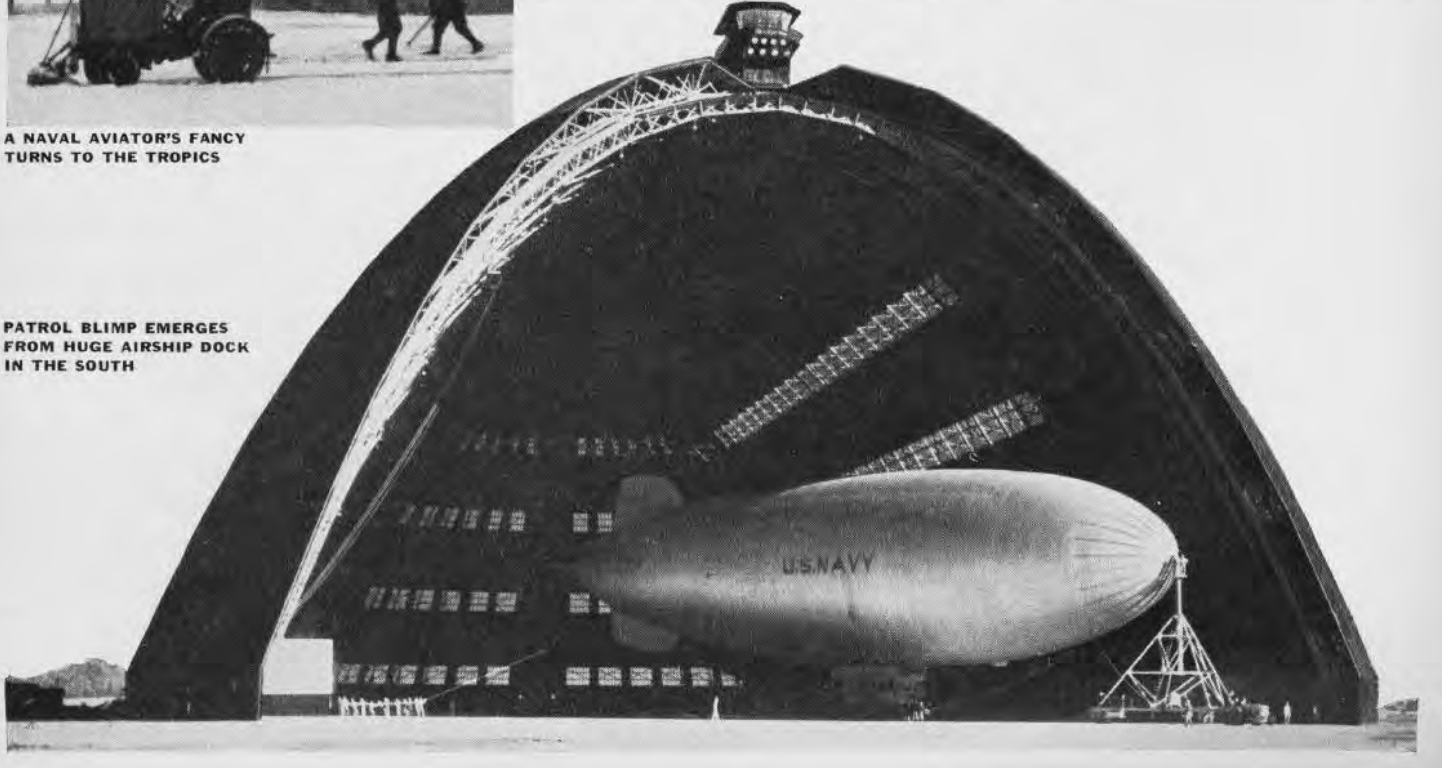
THE MODERN AIRCRAFT CARRIER HAS ASSUMED A ROLE OF GREAT TACTICAL IMPORTANCE IN NAVAL BATTLE STRATEGY



A NAVAL AVIATOR'S FANCY TURNS TO THE TROPICS

FAR TO NORTH, CATALINA CRUISES OVER THE SNOW CAPPED ALASKAN PENINSULA ON PATROL DUTY

PATROL BLIMP EMERGES FROM HUGE AIRSHIP DOCK IN THE SOUTH



SNOWBOUND—IN THE ALEUTIANS, PLANES MUST FLY. THESE MAINTENANCE MEN, SNOW WHIPPING THEIR FACES, DISLODGE A PBY STUCK FAST IN A DRIFT

SUBJECT: TEXAS, DEEP IN THE HEART OF—THE JOB IS THE SAME BUT OLD SOL BLESSES THE EFFORTS OF BEACHING CREWS PULLING UP THE BIG BOAT

TECHNICALLY SPEAKING

Hydraulic Pump Failures

NAS, SANFORD, FLA.—Several instances of hydraulic pump failures have been encountered in airplanes attached to this Command. In one instance both pumps on one plane failed during the same flight. One of two pumps from another plane, subsequently installed on the same plane, failed after three hours.

The entire hydraulic system was checked and no cause found for the failure. It was determined that the drive pinion sheared off because of one or the other of the pump gears "freezing" in its bushing. These gears showed very definite signs of overheating.

No cause has yet been found, although centrifuge tests of the hydraulic fluid revealed a small amount of sediment which on laboratory examination (made at the Station Hospital) resembled pumice very closely.

It was further determined that in at least one case during the ferry hops to this station, the pilot allowed his hydraulic system to run nearly dry, extending his gear with the emergency system. This may have been a contributing cause. Further check-up reveals that the tolerance between gears and bushings is 0.0015 inch while the smallest particle the Cuno will remove is 0.0035 inch diameter.

BUREAU SAYS: The drive pinion in a hydraulic pump is the equivalent of the fuse in an electric circuit. An overload on the pump automatically breaks the link and protects the pump against complete breakdown. The fact that the gears of the pump showed definite signs of overheating indicates one of the following causes:

(1) Low level of fluid in reservoir, making it possible in flight maneuvering to uncover the standpipe of the engine-pump suction line. This will result in sucking air into the hydraulic system. Before the pump can develop enough priming suction to set up proper fluid flow again, the pump has become severely overheated, resulting in shearing the driving pin. Watch the oil level in the reservoir.

(2) In some airplanes, there is a tendency for the oil to foam under certain operating conditions or due to excessive operation. Foaming oil carries innumerable quantities of air bubbles. Normally these collect at the top of the reservoir and in this way clear the oil of air. If this condition is aggravated or prolonged, then the foaming oil is carried down to the pump and results in pump failure.

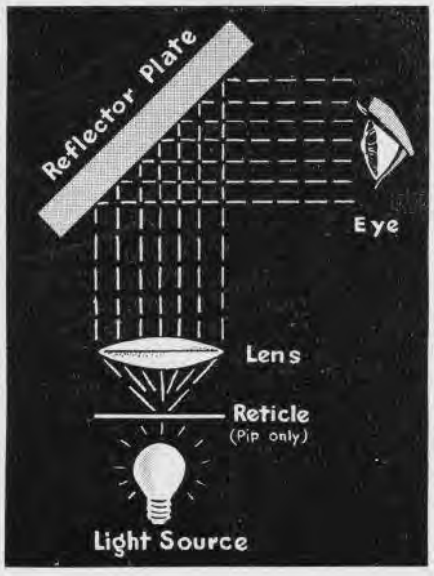
(3) When an airplane has been standing in the sun, particularly in tropical temperatures, the oil temperature may go to 120°; then when the engine is started, the hydraulic fluid merely circulates from the reservoir to the pump, then to the pressure regulator and is by-passed back to the reservoir. As all these units are apt to be directly behind the engine and exhaust collector, the fluid temperature while on the ground may rise to a value greatly beyond 150° F. At these higher temperatures the oil has a very low viscosity and loses a considerable amount of its lubricity. This will result in high pump temperatures, with the subsequent failures.

(4) Conversely, in severe cold tem-

Note on Reflector Sights

NAS, PENSACOLA.—Because of the large amount of movement of the pip and ring in reflector sights, activities have had considerable trouble boresighting on a template or screen at close range. This movement (parallax) of the pip will cause a negligible error at range over 150 feet. The Gunnery Department at Pensacola has found that this parallax can be eliminated for close-range boresighting. Cut a small piece of cardboard or sheet metal to fit tightly over the lens of the sight. In the center of this disc drill a 1/16-inch hole. When this disc is in position over the lens the pilot will see the pip only when his eye is lined up directly behind the reflector plate. All parallax has been eliminated. If the pilot finds it difficult to spot the pip he can move his eye close to the reflector, thus increasing his field of vision through the 1/16-inch hole. In sketch A the pilot can see the pip any place on the reflector by moving his head. In sketch B the disc has been placed over the lens. In this case the pip appears only in the center of the reflector.

A



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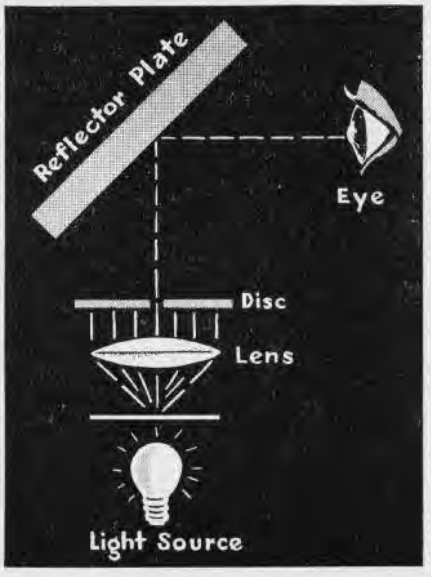
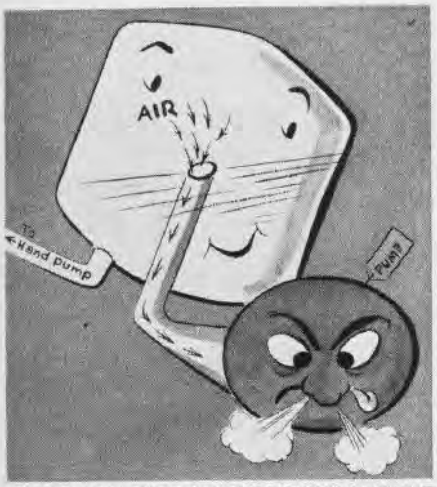


peratures the oil congeals and the pump has trouble sucking the oil through the line from the reservoir and as a result cavitation develops. Cavitation can be expressed as a pump starving for oil, hence overheating.

(5) If an accumulator diaphragm fails, then the air from the accumulator is pushed through the system and usually develops a foaming condition. In the meantime the air space in the accumulator is taken up by more oil robbed from the reservoir. Result is an uncovered standpipe.



DEATH SCENE: PUMP GAGGING ON TOO MUCH AIR

(6) There are of course failures due to breaking of lines or bullet holes in combat which will result in similar trouble.

Arresting Gear Material

Reserve Stock Strategically Located

There have been several instances where aircraft carriers and auxiliary carriers in urgent need of arresting gear material reserve stock have overlooked important sources established at strategic world places several months ago.

In view of the fact that these facilities were set up for the specific purpose of having material available where and when it is needed, it is strongly urged that responsible air personnel call the attention of supply departments to these locations, which are reviewed here.

Arresting gear deck pendants, purchase cables, and barrier cables are now carried in stock for all operating aircraft carriers and auxiliary aircraft carriers at NAS, Pearl Harbor; ASA N. S. D. Oakland, Calif.; ASA NAS, Norfolk, Va., and one base in the Southwest Pacific which can be identified by contacting ComAirPac. The quantities in stock at each point are listed in BuAer Allowance List E-1 which has been distributed to the C. O. and P. C. O. of interested vessels. (February 1943 latest revision). All requests for this material should be made upon the nearest available stock point. Spare parts for other elements of the arresting gear system are retained in stock at NYPEARL and ASD Noumea, New Caledonia and any such material, also listed in BuAer Allowance List E-1, should be requested from these points.

Navy Glider

A public test for the Bristol XLQ-1 glider was held recently at the Philadelphia Navy Yard. The XLQ-1 is an amphibious glider, built chiefly of wood, is 40 feet long, has a wing span of 72 feet and can carry 12 men with full equipment. The glider was taken aloft behind a Catalina seaplane. It circled the yard twice, then landed on the Delaware River.

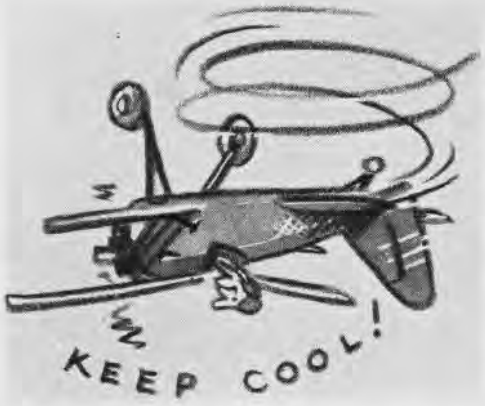
(Succeeds list dated February 25, 1943)

LIST OF THE LATEST NUMBERS OF ENGINE BULLETINS AND CHANGES

March 20, 1943

ENGINE	PRATT & WHITNEY		WRIGHT		DATE
	BULLETIN	CHANGE	BULLETIN	CHANGE	
R-985	96				Being issued.
R-985	97				Do.
R-1340	189				Do.
R-1535	215				Do.
R-1690	200				Do.
R-1830	307				Do.
R-1830	308				Do.
R-1830	309				3-18-43.
R-1830	310				Being issued.
R-2800	56				Do.
R-1830-86		11			1-22-43.
R-1830-86		10			1-22-43.
R-2800-8		2			3-1-43.
R-2800-31		1			3-1-43.
R-760			76		Being issued.
R-760			77		Do.
R-790			8		Do.
R-975			16		Do.
R-975			17		Do.
R-1820			318		Do.
R-2600			72		2-8-43.
R-2600			73		Being issued.
R-2600			74		Do.
R-2600			75		Do.
R-2600			76		Do.
RANGER					
V-770			7		2-24-43.
V-770			8		3-5-43.
V-770			9		3-9-43.
V-770			10		3-10-43.
V-770			11		Being issued.
V-770			12		3-17-43.
R-1820-50				3	Being issued.
R-2600-8				6	Do.

TECHNIQUE OF RECOVERY FROM INVERTED SPINS



In view of the number of recent accidents which have resulted from inability of pilots to recover from inverted spins, it is considered that existing instructions on this subject are inadequate. Practical recovery from inverted spins is being included in the Flight Syllabus at all training centers, and by this means it is hoped to eliminate completely the current fallacious idea that recovery is necessarily difficult. A re-study of Technical Note Number 29–30 gives the impression that the inverted spin is a somewhat dangerous and unfamiliar maneuver and the correct technique for the recovery therefrom is slightly obscure. Technical Order No. 20–39 does little to remove this uncertainty.

THE general precautionary measures involved in the normal spinning of any aircraft, quite naturally, apply to the inverted spin. The most cogent considerations in spinning any airplane are:

(1) Any plane which is difficult to spin may also be difficult to bring out of the spin.

(2) The higher the altitude at which the plane is spun, the more difficult it will be to bring it out, as an increase in altitude has the same effect as an increase in the wing loading.

(3) The pilot's ability to place all controls on "full" in all directions is essential. In an inverted spin the pilot is thrown away from the controls, and unless a conscious effort is made he will find himself hanging onto the stick rather than actually moving it back and forth; the inexperienced pilot thinks that he is pulling the stick *back* when in reality he is probably trying to pull it *out* of its socket.

(4) The proper use of the elevator tab control is decidedly important. It is obvious that in order to promote ease of recovery from a spin the tab should be set so as to make the plane nose-heavy for normal spinning and tail-heavy for inverted spinning. Under normal conditions, where the spin is entered inadvertently, it is thought that the tab setting will be in the near-neutral position, and, unless stick forces are very high and recovery very difficult, it will be unnecessary to re-adjust the elevator tab setting to complete recovery.

(5) The inexperienced pilot is apt to have difficulty in recognizing the early stages of the inverted spin when first entered. If power is on the spin is apt to develop very rapidly and lead to confusion, but the sensation of being thrown away from the controls is a certain indication that the spin is inverted rather than normal. This uncertainty will completely disappear after several practice inverted spins.

THROWN AWAY FROM THE CONTROLS

The inverted spin has been carefully studied by engineers and pilots with practical experience in recovery from this maneuver. The results of these studies indicate that recovery from the inverted spin is often more rapid and certain than from the normal spin for the following reasons:

(1) In the inverted position the wings of the airplane have less lift and greater drag, thus acting to retard autorotation.

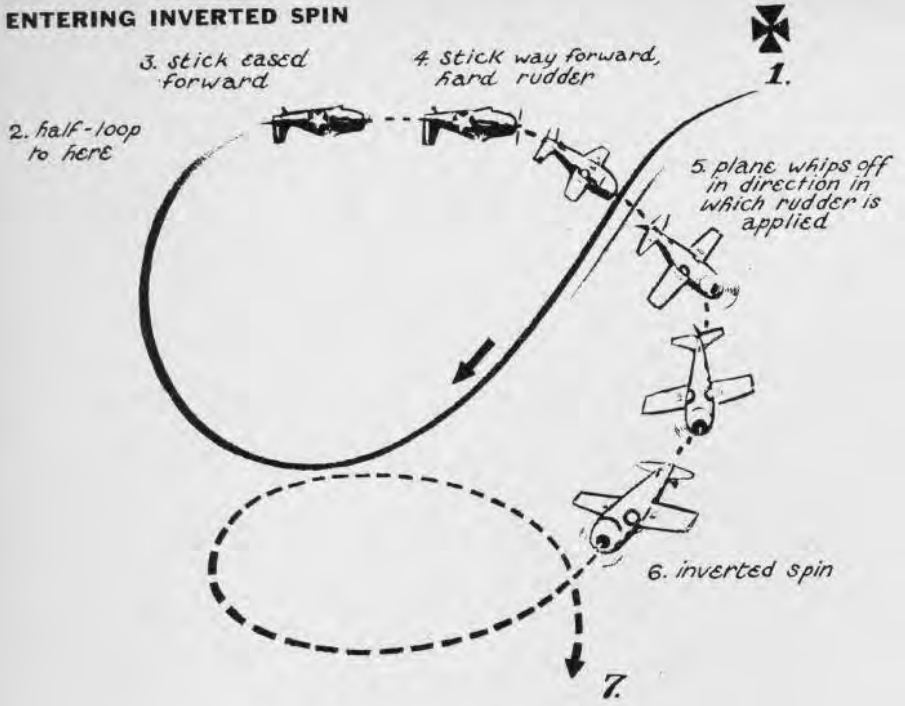
(2) Practically all aircraft have greater throw up-elevator than down-elevator, thus giving greater control for recovery from an inverted spin than from a normal spin.

(3) The average airplane is designed so that the airflow impinges more directly on the elevators, when set for recovery from inverted spins than from normal spins.

(4) Due to the relative position of the horizontal tail plane to the rudder, there is less tendency for the horizontal surfaces to blank the rudder in the inverted position.

The best method of entering the inverted spin is from the half-loop position. As the plane approaches the inverted horizontal, the stick is eased forward to maintain this attitude, and just before the plane stalls the stick is pushed completely forward and hard rubber applied. The average plane will then whip off into an inverted spin in the direction in which the rudder is applied. If the plane stalls completely with the stick all the way forward and then rudder is applied after the nose has begun to fall, it very probably will not spin but will slide off into a skidding inverted

ENTERING INVERTED SPIN



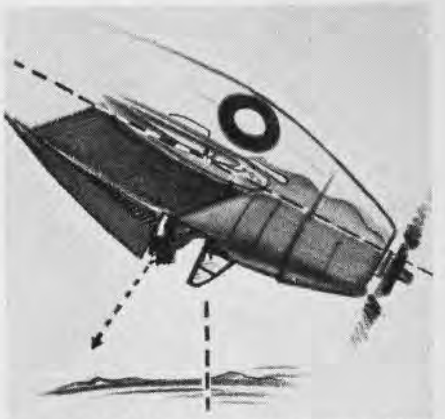
RECOVERY FROM INVERTED SPIN

spiral and lose altitude much more rapidly than if a normal inverted spin develops. Practical experiments have indicated that no inverted spin has ever developed with the stick pulled back, regardless of the attitude of the airplane.

The following technique, fundamentally parallel to that for recovery from normal spins, will produce rapid and certain recovery from the inverted spin:

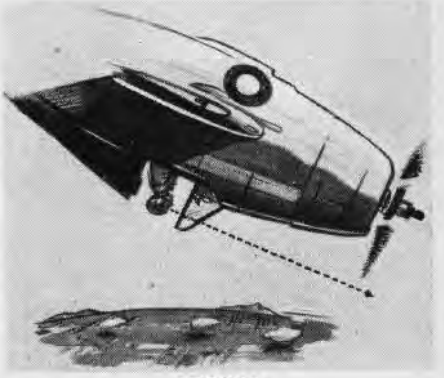
(1) Cut the gun. . . . . .

(2) Kick hard opposite rudder against the direction of rotation. The nose follows the rudder in all attitudes. The pilot's impression of the direction of rotation is correct only as long as the line of vision goes along or in relation to the nose of the airplane, and if, while in an inverted spin the head is thrown back and the line of vision goes straight down to the



THIS GIVES ILLUSION OF REVERSE ROTATION

ground, the direction of rotation is apparently reversed. *It is therefore mandatory that a visual determination of the direction of rotation be made by reference to the nose of the airplane.* The turn indicator will show the true direction of rotation in either normal or inverted spins.



HORIZON

(3) Pull the stick all the way back, neutralizing the ailerons.

(4) As soon as autorotation ceases, complete the recovery from the inverted position by either rolling out with the ailerons or completing the loop or a combination of the two.

(5) Ease the throttle on very gradually to prevent engine bearing damage, as during the evolution oil pressure will probably have been lost.

(The instructions contained in Technical Order No. 84–42 remain in effect, except for N3N–3 airplanes, for which the inverted spin restriction has been removed. Table II of Technical Order 84–42 should be modified to read as follows: See Technical Order No. 23–40 and Technical Order No. 8–43. This technical order supersedes and cancels Technical Order No. 22–41.)

The "Why" of Manifold Pressure Gages

In an airplane equipped with an unsupercharged engine, the available horsepower of the engine is steadily reduced as the airplane gains altitude. This is due to the reduction in pressure of the atmosphere with increasing altitude. Finally, at a relatively low altitude, the power available is reduced to such an extent that the airplane can climb no higher.

Ordinary atmospheric pressure at sea level is about 15 pounds per square inch and will support a column of mercury about 30 inches in height. Estimated roughly, atmospheric pressure drops off at about 1 inch of mercury for each thousand feet. So at 10,000 feet, atmospheric pressure is only about 20 inches of mercury or about 10 pounds per square inch.

To overcome this difficulty a supercharger is employed to pump air into the engine. Some limit must be fixed to the amount of pressure that can safely be imposed by the supercharger, or damage to the engine will result. Because of this, and in order that the pilot may be kept informed of what is taking place, the manifold pressure gage is installed.

Army and Navy manifold pressure gages are graduated to indicate the absolute pressure in inches of mercury. For many years the normal range of these instruments was 10 to 50 inches of mercury. The AN standard instrument now has a range of 10 to 75 inches of mercury. This higher range is made necessary by the use of more powerful superchargers with high performance engines.

What's wrong with this picture? Answer to Panel Board Teaser on p. 19: Gas is off on Take-off.

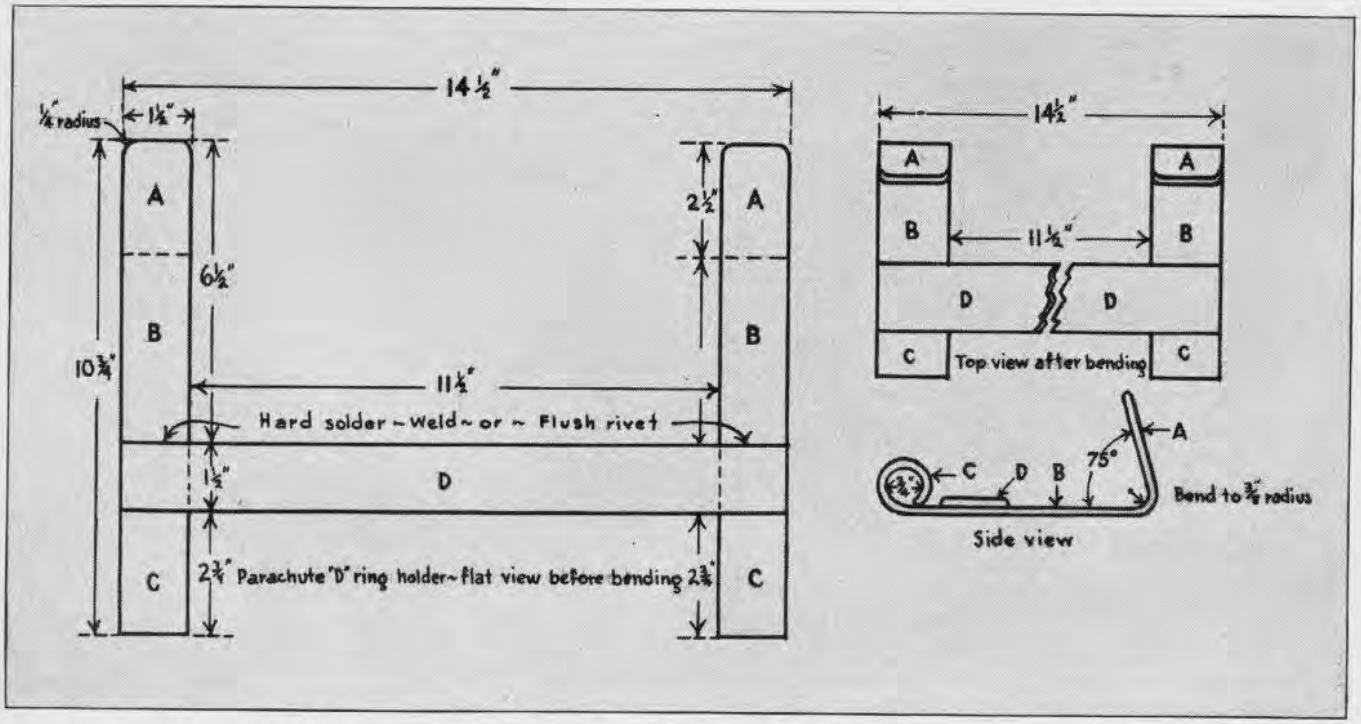
Oxygen Does Not Burn

Oxygen is not inflammable in air, but will cause substances to burn more violently. This fact, reported in the British *Tee Emm*, comes to light in the statement of a pilot who escaped after burning his aircraft which was forced down in neutral territory.

"I turned the oxygen on in the cockpit, and struck a match and applied it to the jet," the pilot reported. "There was an explosion and the cockpit caught fire immediately."

It seems clear that after the crash the cockpit was soaked with gasoline and also partially impregnated with gasoline fumes. This condition caused the explosion and firing of the cockpit when the match was struck.

Oxygen is not inflammable. The only noticeable effect of holding a lighted match to a jet of oxygen is that the match burns more quickly and more brilliantly.



Parachute Ring Holder

NAS, JACKSONVILLE.—This station has discovered that by use of the parachute "D" ring holder (see illus.) on packing tables, lift webs can be held rigid at the proper spacing of their entry into the container, thereby eliminating breakage of tacking threads. The use of one strand of ⅜-inch elastic exercising cord through "C," exerts sufficient tension on the canopy and cordage to expedite packing.

Material—⅛-inch stainless steel—three pieces 1½ inches wide.

Section D is a spacer 14½ inches long—Hard soldered—welded or plush riveted to "ABC" and "ACB" as shown.

"ABC" and "ACB" 10¾ inches long—section "A" to be bent over a ⅜-inch radius to 75° angle as shown in side view.

Section "C" to be bent to a ¾-inch circle.

Finish—All edges to be rounded off—entire tool to be buffed and polished.

U. S. GOVERNMENT PRINTING OFFICE: 1943

SBD DAUNTLESS

Douglas—U. S. Navy Scout Bomber
Army A–24 Dive Bomber

Span: 41 feet 6 inches.
Length: 33 feet.
Service Ceiling: 25,000 feet.
Approximate Speed: 245 m. p. h. at 14,000 feet.

DISTINGUISHING FEATURES—*Low wing monoplane with single radial engine. Wings with equally tapered lead and trailing edges, rounded tips, and dihedral on outer panels. Trailing edge of wing fairs gracefully into tapering fuselage. High single fin and rudder faired into fuselage.*

INTEREST—This excellent dive bomber has seen much action from carriers of the U. S. Navy in the Pacific, notably in the Coral Sea Battle and at Midway. Long considered to be the finest carrier-based dive bomber in the world, it is now excelled in some respects by the more recently developed Helldiver. As the A–24, the Dauntless is the first dive bomber to be used in quantity by the United States Army in support of ground troops. A 1,000-pound bomb is carried in a cradle under the center section. Bomb racks are also fitted under the wing roots.