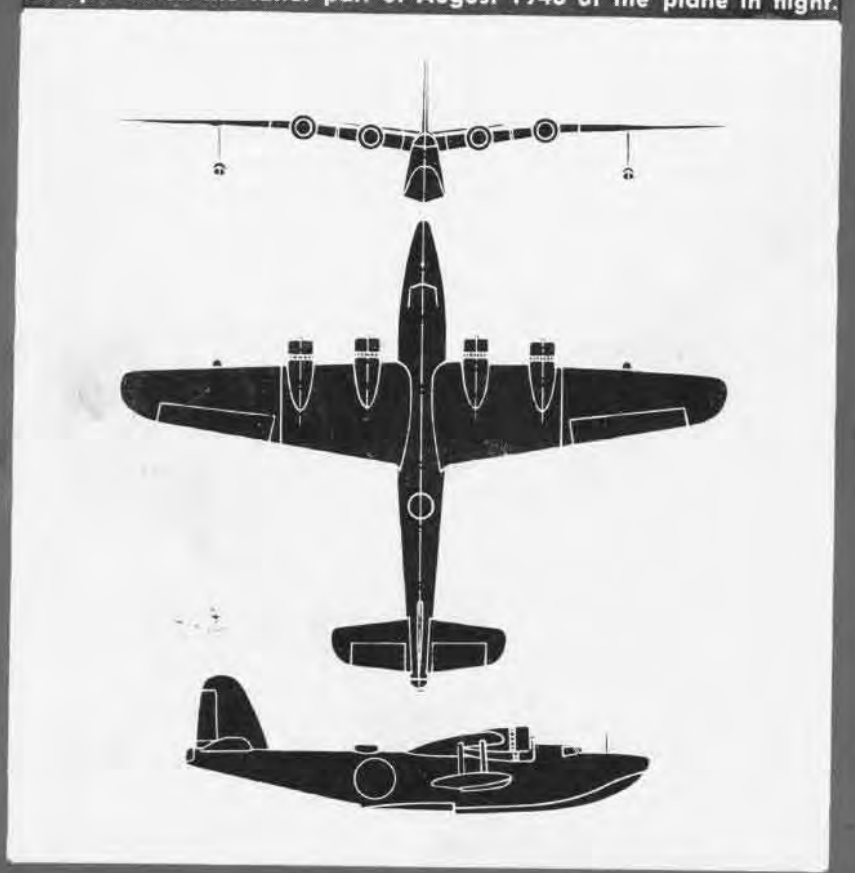
Note: Diagrams below were derived from vertical photographs taken July 12, 1943, at Makin Atoll, Gilbert Islands, and a right-angle oblique taken the latter part of August 1943 of the plane in flight.



EMILY TYPE 20 NPB

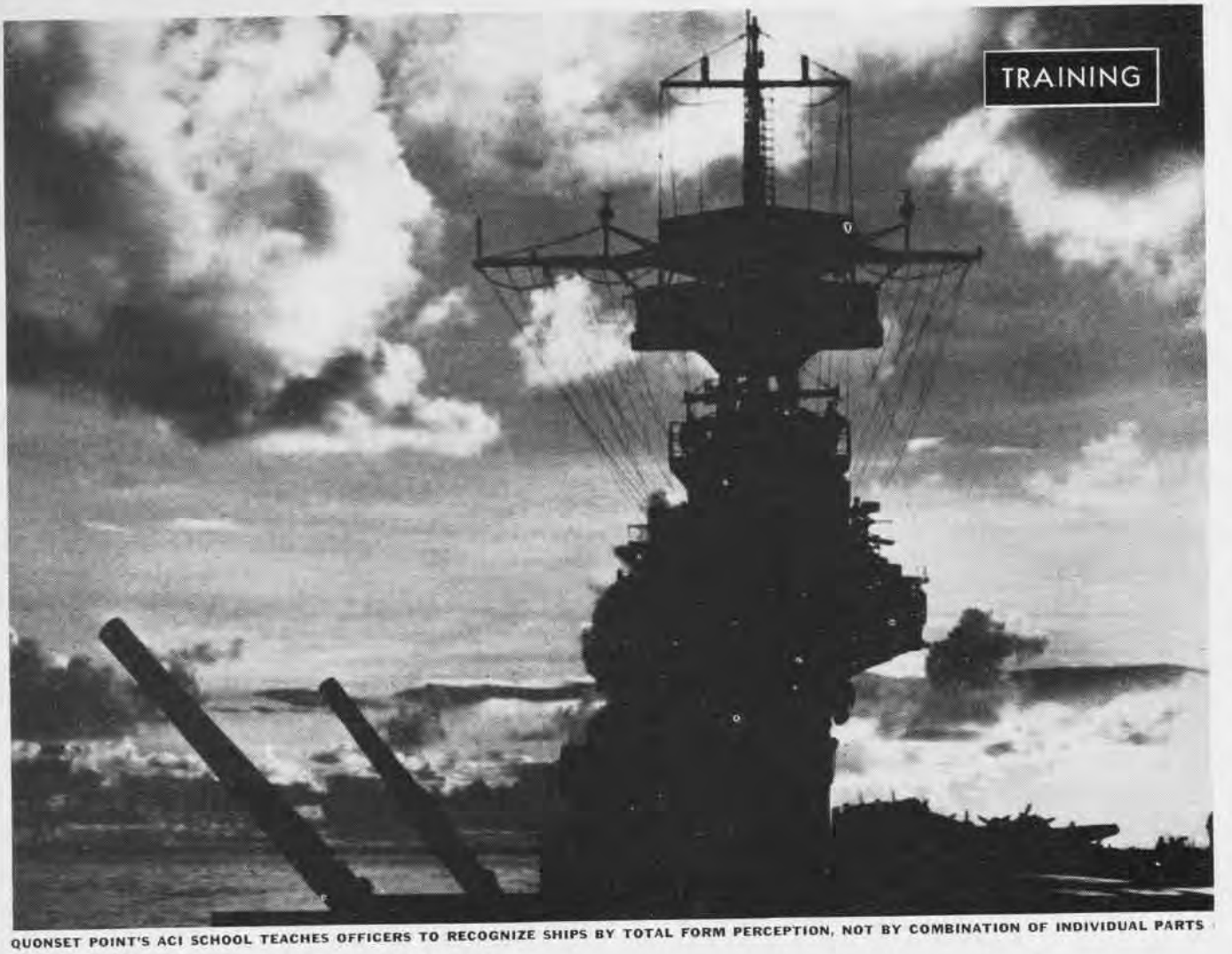
JAPANESE 4-ENGINE FLYING BOAT

Span 118 feet. Length 90 feet

DISTINGUISHING FEATURES—High gull wing, with radial engines grouped quite compactly. Long sweeping bow; large single vertical stabilizer and rudder. Size of bow indicates a gun position, possibly a power turret. There is a dorsal turret and sizable tail gun position.

INTEREST—Fuselage of this airplane closely resembles that of the Kawanishi Navy type 97 four-engine flying boat. (Similar to Sikorsky S-42.) In size it lies between British Short *Sunderland* and the Short Empire class "G." The large area of fin and rudder, and the proportion of span to length, follow the Empire "G" class. The Japanese plane differs from all the Short flying boats in that it has a longer nose, similar to the Kawanishi 97, has the engines grouped more compactly, and has much more aileron area. Gull wing construction differs from both Short boats and the Kawanishi type construction.

Interpretation of these photographs presents corrections and addendas to what was previously known about this flying boat. Camera tilt prevents extreme accuracy in determining dimensions and design.



QUONSET POINT'S ACI SCHOOL TEACHES OFFICERS TO RECOGNIZE SHIPS BY TOTAL FORM PERCEPTION, NOT BY COMBINATION OF INDIVIDUAL PARTS

HOW TO IDENTIFY SHIPS

At the Start Quonset Picks Out Peculiarities—Like Joe Brown's Bushy Eyebrows

THE most important problem that confronts the teacher of ship recognition is determining what and how many details of a ship's superstructure should be singled out for special emphasis. Of course, care must be taken not to overburden the beginner with a mass of irrelevant detail. The analogy has frequently been drawn between identifying ships or planes and identifying people one meets, to explain the need for knowing a ship or plane not as a combination of parts, but as a "total form" perception.[1]

This analogy can be extended. When meeting a group of strangers, unless gifted with a phenomenal memory, one is forced to rely upon peculiarities in appearance of each in the group—scar or mole, way of talking—to individualize each of the people. When seeing these people later, a "total form perception" replaces the need for the earlier means of identification. This "instinctive" recognition will have developed more rapidly because of concentration at the start on a distinctive detail—Joe Brown, the fellow with the bushy eyebrows.

This process of learning is applicable to ship recognition. To distinguish between United States and British one-stack destroyers, only a few details are needed. It is sufficient to point out that all British one-stackers

[1] See Introduction to the War and Navy *Recognition Pictorial Manual*.

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have tripod foremasts, flash screens between their forward gun houses, and sharply raked bows, whereas no one-stack United States destroyers have tripod foremasts or flash screens forward, and their bows are less sharply raked. These characteristics will be no more apparent at long range than Joe Brown's bushy eyebrows; all destroyers are notoriously alike when seen on the horizon. But it must not be forgotten that Joe Brown's eyebrows played an integral part in making it easy to distinguish him from the rest, though later they were no longer needed in recognizing him from afar.

Confidence an Element of Learning

Details of armament, comparative freeboards, types of bridge structure and the like might also have been included in the initial presentation of U. S. and British one-stack destroyers. But confidence must be built up in a beginner. The sooner one can thumb through a file of pictures and recognize what he sees, the better will be the results. Trying to master many details for each ship or plane results in a slowing down of the learning process. This is very discouraging to the beginner. When it becomes necessary to make the picture more detailed—to avoid confusion with other one-stack destroyers (say, the Italians)—additional facts can be added. There is no need for this information at first.

Time is an essential factor at Quonset's Air Combat Information School. Besides other subjects student officers try to master during the eight weeks' course, they have also to learn navies and air forces of the United States, Great Britain, Japan, and Germany. This schedule leaves approximately one week for all ships of the U. S. Fleet, another for our Navy and Army combat planes, a third for the British Fleet, and so on. It has been found distinctly helpful to present all material on a comparative basis. During the first classroom hour, silhouettes of all U. S. one-stack battleships are projected at the same time on a screen, so that one will be learned in relation to the rest: the high, solid tower-bridge of the *South Dakota,* nearly twice the height of her wide stack, is contrasted with the lower, less massive, tower-bridge of the *Tennessee;* the *Nevada's* barely discernible tripod foremast and sharply pyramidal profile amidships are seen to differ markedly from the higher tripod foremast and the more spread-out effect of the superstructure on the *Pennsylvania;* the *New Mexico's* cluttered tower-bridge, of about the same height as her stack, gives her and her sister ships a uniquely stubby squat appearance; while the prominent tripod mainmasts, set well aft on the *Texas* and *Arkansas,* keep these ships distinctly segregated from any of the others. Such contrasts, far from tending to confuse the beginner, have been found highly effective in bringing into prominence those essential differences upon which distinguishing one ship from another is based.

. . . Continued

THE aim at Quonset's ACI Officers' School is to develop students' ability to identify ships by a process of "Total form perception." The process can be stepped up, at first, by picking out distinguishing characteristics. This is the sequel to an article which appeared in the July 1, 1943, issue of this magazine.

Selecting Ships' Characteristics

Deciding which details of a ship's superstructure should be selected for special emphasis is not always so easy, especially when long-range recognition is involved. Ships of the *Atlanta-San Diego* class near-by, for instance, would seem to present no difficulty; flush deckline and the three turrets forward and aft apparently individualize these ships sufficiently at any range. Action photographs from the South Pacific suggest otherwise; with after turrets completely obscured, and forward turrets not too clearly outlined, the *Atlantas* are nevertheless still recognizable from their prominent after islands with the single, high fire-control tower, just abaft the cluttered second stack.

Similarly, the hangar structure on cruisers of the *New Orleans* class tend to become still more massive the farther off they are, giving a heavily built-up appearance, well aft on the deckline. Details such as those just mentioned, which do not necessarily command attention when the ships in question are near at hand, are obviously points which an instructor should stress for a class, because it is long-range recognition that is of primary interest.

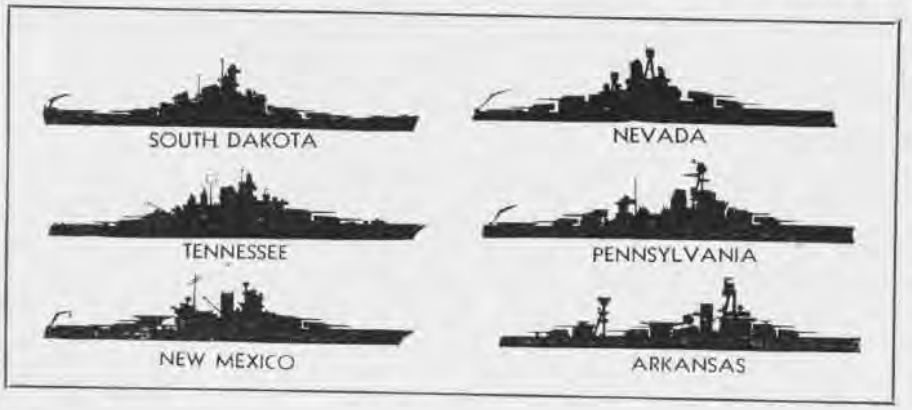
What Does It Look Like Far Away?

There is, of course, no sure way of knowing how a ship is going to look when far distant, if only close-up shots are available. Actual observation would be ideal; the next best solution is to make use of photographs. The occasional releases of combat pictures constitute an excellent source for long-range views of ships and planes, in unconventional positions; but the number and types of ships and planes included in such releases are necessarily limited. A steadier and more inclusive supply can be obtained by having larger pictures reduced in size.

On a piece of cardboard 15″ x 8″ from ten to fifteen of the smaller pictures, from such a publication as *O. N. I. 54–R,* may be mounted, and two or three prints of the collection made, ranging in sizes from one-quarter to one-sixteenth the size of the originals—depending upon clarity or background of the original.

In this manner it is easy to build up a good working set of what corresponds to long-range views of ships or planes; and the instructor is better enabled to decide what are the really distinctive features to be emphasized.

These reduced-in-size pictures should also be made available to the students. Use of card files, contain-



NIP NOTES

HEAVY CRUISERS

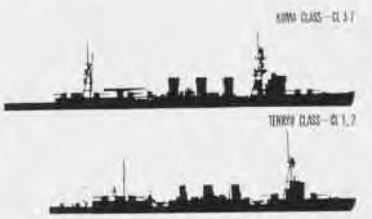
the NIPS big cruisers
forward stack
is always fat
and falling back

LIGHT CRUISERS

all the NATORI cruisers show
three stocky nippos in a row

and SENDAI with her sisters bore,
when last observed, a row of four

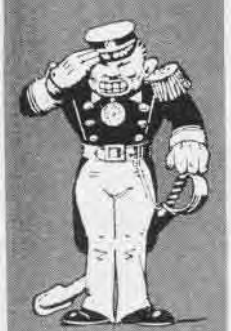
the KUMA class
has for its share
three stacks wide-flared
for anti-flare



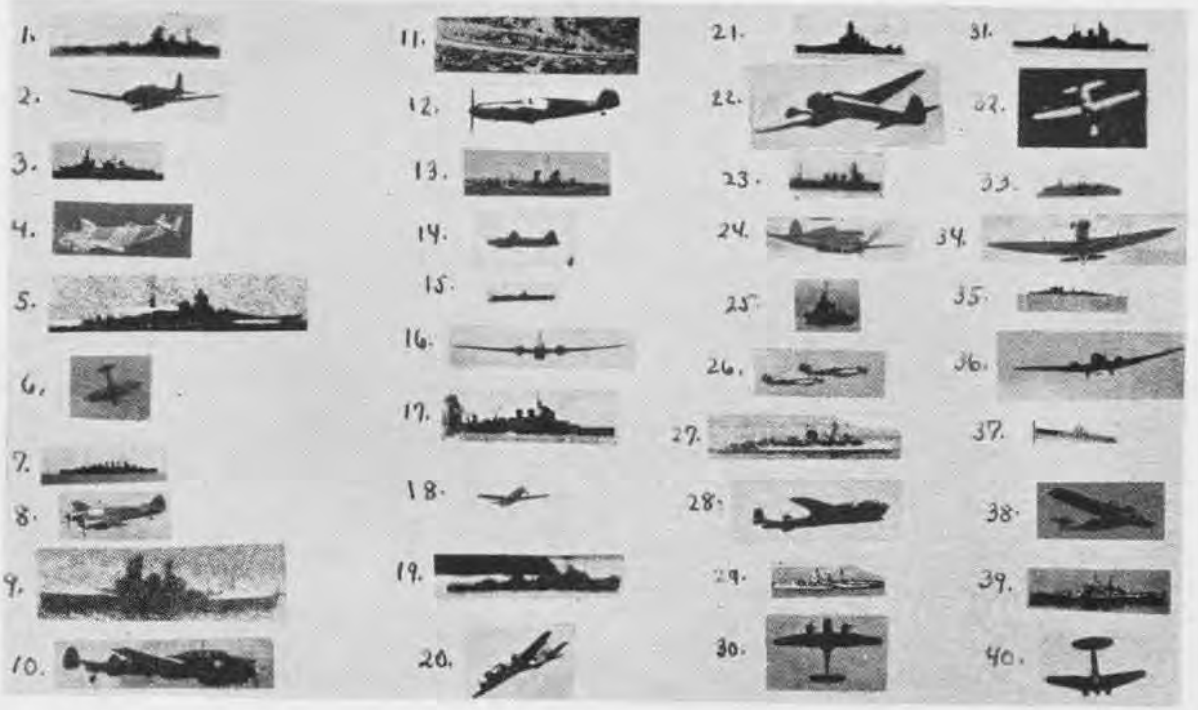
DESTROYERS

the newer NIP DD combines
sharp raking stacks and wavy lines

the older ships have upright stacks
and all their bows have turtle backs



ONI—41—42
JAPANESE
NAVAL VESSELS



One of the Final Examinations in Recognition Given to the Student Officers at Quonset's ACI School

1. NELSON
2. KATE
3. PENSACOLA
4. VENTURA
5. SCHARNHORST
6. VAL
7. DEVONSHIRE
8. BEAUFIGHTER
9. KONGO
10. ME–110
11. TERATSUKI
12. ME–109F
13. GRIDLEY
14. BETTY
15. RANGER
16. WELLINGTON
17. RENOWN
18. MUSTANG
19. GERMAN DD
20. FORTRESS
21. SOUTH DAKOTA
22. JU–88
23. TENRYU
24. WAR HAWK
25. BENSON–BRISTOL
26. NELL
27. LEIPZIG
28. DO–217E
29. MALAYA
30. BEAUFORT
31. NACHI
32. RUFE
33. OMAHA
34. SPITFIRE
35. NEWCASTLE
36. JU–52/3M
37. NEVADA
38. CATALINA
39. CLEVELAND
40. HE–111K

[SHIPS . . . CONTINUED]

ing pictures of ships and planes as well as silhouettes, has been found effective at the Air Combat Information School in building familiarity with the material presented. In the school's library, students have several duplicate files, including most recent and varied shots of each ship and plane studied. These are in addition to the excellent collection of slides furnished by the Navy Recognition Department. Students are urged to run through the card files once a day if possible, not looking at individual photographs for longer than a second before making identification. By this additional process of repetition, what has already been learned is in less danger of becoming rusty or lost, and familiarity with new material is facilitated.

Correction

In the article on Royal Air Force in its Sept. 15 issue, Naval Aviation NEWS *stated that "in 1918 all aircraft including those on carriers and plane-carrying fighting ships of the Navy were merged in Royal Air Force, where they remain today." The statement should have read that all aircraft except those mentioned were merged in RAF.*

RECOGNITION OF SHIPS IN HEAVY SEAS DEMANDS KEEN, CRITICAL EYES AND ABILITY TO IDENTIFY VESSELS THROUGH TOTAL FORM PERCEPTION

GRAMPAW PETTIBONE

Bailing Out Problems

During test flight of an F4F–4, the stick jammed in the full forward position (cause undetermined), forcing the pilot (397 hours) to bail out. The following remarks from the pilot's statement are quoted as a reminder that bailing out, while not requiring actual practice, does merit some thinking ahead to enable you to meet the problems you may be up against:

"The cockpit enclosure jammed about two-thirds open as I tried to get out; however, I was able to get out without using the emergency releases. I was clear of the plane at approximately 5,000 feet.

"For information concerning my actually getting free of the cockpit, which might be of value to other pilots, these notations are added:

"*1.* I should have used the emergency releases first, instead of attempting to open the hood in the regular manner; in the excitement of attempting immediate escape and due to the wind pressure from the great speed accumulated in a vertical dive, cockpit hoods will jam, stick, or appear to jam very easily, as mine did.

"2. When a plane is in a vertical dive, it is impossible to 'jump' out in the direction which you may decide is best. The speed of the plane and the inertia of my body forced me back against the seat so that I was only able to force myself straight out. When I had forced enough of my body out of the cockpit, the wind pressure 'toppled' me out. I must have gone directly aft, yet missed the tail.

"*3.* Due to the speed which the plane had when I left it, the speed of my body must have been well *above terminal velocity,* for the pilot chute of my parachute was torn off and all the section seams were pulled almost apart. I was almost unconscious due to air pressure when I left the plane and so pulled the rip cord as soon as I could reach it. With a good deal more altitude it would have been better to delay a few seconds to allow the speed of the body to slow down as an insurance against ripping the chute and lessening shock to the body when the chute opens. The only injuries I sustained were bruises and sprains received when the parachute opened."

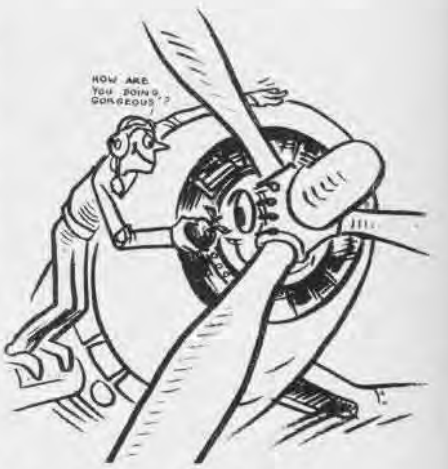
[Note: Review Aviation Training pamphlet *Parachute Sense.*]

A Starting Tip

A TBM–1 airplane was recently delivered by air to an operating squadron. During the acceptance check, prior to flight, a large piece of cylinder skirt was found in the engine oil sump.

The piece of cylinder skirt had marks of the connecting rod upon it, indicating the connecting rod had been bent enough to break the piece off. This could have been caused by overpriming or by starting the engine cold, without pulling the propeller through first.

All pilots operating on detached missions are cautioned to insure that engines are started properly; that propellers are pulled through by hand before starting a cold engine.



Pamper Your Engine

After the installation of a new engine in an FM–1, a pilot was instructed to take the aircraft up for an engine run-in flight and to operate at low power. Shortly after take-off, the pilot noticed a strong odor of gasoline, which he thought was cleaning solvent. Upon reaching 4,500 feet, he proceeded to do a loop. Before recovery was completed, smoke filled the cockpit and the pilot observed flames beneath his feet. He immediately rolled the aircraft over and dropped out, parachuting to the ground from about 3,000 feet. The airplane burst into flames upon striking the ground.

Grampaw Pettibone says:

A guy that would punish a new engine like that would probably beat up little kids in a dark alley!

Being raised in the old school, I'm a bug on engine care. Here's an example of why: Last war's PBY's were F5L's with "Liberty" engines. The Liberty engine was a good engine, but its weak spot was the water jacket. When the engine was pushed the water jacket would leak along the welded seam, and when it leaked the engine would heat up and stop. I remember on one trip from Newport to Guantanamo we were supposed to stay in formation. The trouble was that the leader had the best plane and carried the least spares. He would set the speed and by the time it trickled back to me in the tail position.

I had to fly practically wide open to keep up. So—I would ease back on the throttles and just coast along—and arrive about a half-hour after everybody else had landed. I got hell every night and a bunch of "close-up" messages every day, but it was worth it because my "flying mud-turtle" (each plane had its own insignia then) was the *only one* to reach Guantanamo (after 4 long days) without requiring an engine change.

I know modern engines are greatly improved, but they still have limitations. Each individual engine has its weak link; the thing that lets go first when it is overstressed. Engines don't always fail the minute they are mistreated (this is what makes pilots careless), but they do store it up. Failure is progressive and will catch you some day when you least expect it, and can least afford it.

That's why I explode when I run into an engine bully; a pilot with a weak mind and a strong arm who constantly runs "wide open." Somebody has to pay the penalty for such abuse and, unfortunately, it is often you and I, who always treat our engines with consideration.

Engine restrictions aren't designed to handicap the pilot; they are put on an engine because elaborate tests have demonstrated that those are the limits of safe operation. If you are smart, you will accept these limitations.

I know war requirements sometimes demand operations far in excess of prescribed limits—and the engines have many times taken the beating and come home in one piece. Notwithstanding this, everything I have said still goes.

Don't make such excess your standard. Pour it on when you have to for safety, but get back into safe operating range the moment the immediate emergency is over. There's no need of making your job any more dangerous than it naturally is. You are driving a lot of horses, but you got to know how to treat 'em to get the most out of them. Remember, you expect that engine to take you over a lot of water and rough terrain. O. K.! TAKE CARE OF IT.

[See T. O. No. 48-43 on run-in precautions and know the restrictions of your particular engine.]

Overhaul Trouble

During engine installation in an R2D-1, an inspection tag was snipped off and its attaching wire left in the magneto. One hundred and sixteen engine hours later this caused the magneto to short out, several plugs to foul, and the engine to cut out. Thus, this negligence (possibly due to ignorance) was the basic cause of a deferred forced landing which resulted in "strike" damage to the airplane. Fortunately, none of the 13 persons aboard was seriously injured.

Marine Warning

Marine Base Defense Aircraft Group 42 has experienced a considerable number of aircraft accidents, coincident with the influx of relatively green pilots. The Group's news letter briefed some of these accidents and expressed the hope that other pilots would benefit from the publication of these experiences.

1. One SNJ pilot made a "wheels-up" landing, resulting in the loss of the plane for at least 2 weeks. Coming in for a landing the pilot lowered the wheels and then proceeded to retract them instead of lowering the flaps. In this case "Dilbert" had groped blindly for the controls which are clearly marked and not easily confused. To forestall future, similar accidents, a 30-degree-flap rule for landings has been adopted which will necessitate observation of the flap indicators and precludes the possibility of using the wrong actuating mechanism.

2. "Dilbert" No. 2 stood an SNJ on its nose as a result of deciding to join a group of TBF's in shooting carrier landings. The pilot, assuming that the TBF in front of him was shooting another landing, was suddenly aware that this was his final landing and was confronted with the alternative of chewing up the TBF's tail or standing the J on its nose. He chose the latter and put another plane out of commission.

3. A fatal accident occurred when a take-off in an SBD was attempted with the propeller in high pitch. The airplane never became air-borne; it ran off the runway and into a swamp, where it overturned.

4. Another fatal accident occurred when a sharp left turn was attempted with insufficient air speed. Apparently, while in the turn, the pilot kicked top rudder, causing the plane to go into a stall and spin into the ocean.

5. Another squadron suffered its first casualty when a pilot disregarded instructions to maintain contact flight rules and decided instead to fly through an opening in the overcast. After flying on top for a while, he was unable to find an opening to let down and, as a result, was forced to fly down through the overcast. Unfortunately, he crashed into the mountains.

THIS IS WHAT OFTEN HAPPENS WHEN SIMULATED EMERGENCY LANDINGS ARE CARRIED BELOW PRESCRIBED ALTITUDE.

Accident Reports

A Court of Inquiry, Board of Investigation, or an Administrative Report must be submitted on each fatal accident. Where there is no doubt as to the facts of an occurrence and no reason why sworn testimony should be obtained, an administrative report is satisfactory. It is not necessary to submit a separate report for each individual involved in an accident; for example, in a collision, only one board of investigation or administrative report, covering all personnel and airplanes involved, should be submitted. Do not forget the opinion concerning "line of duty" and "misconduct" status for all injured or deceased personnel. Convening authorities should insure that this opinion is included in forwarding endorsements where opinions are not required by precepts. [See Cts. & Bds., Chaps. IX and X, and BuAer Circular Letter 11-42.]

The above reports do not take the place of Aircraft Trouble Reports.

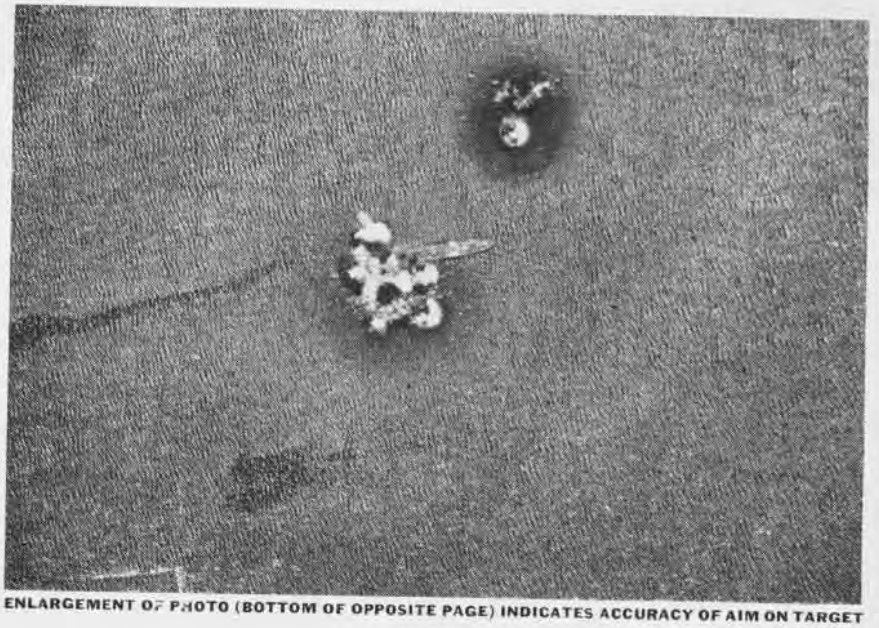
In making dispatch reports of accidents, some units submit a separate dispatch on each person involved. If the necessary data are available, it is desirable that such information be consolidated in one dispatch.

JAP TANKER SINGLED OUT AS TARGET RECEIVES STICK OF BOMBS; OTHER VESSELS SQUIRM AND SCURRY AWAY IN ALL DIRECTIONS

JAP SHIPS UNDER ATTACK

Army-Navy Cooperation Close in Making Photographic Record Guiding Attacks on Jap Ships

THAT aerial reconnaissance rapidly is being pushed to the fore as a vital tactical weapon is indicated by these photographs of Jap shipping in Tonolei Harbor, South Bougainville Island. Navy cameramen were flown to the scene by Army aviators piloting B–17's. Within 30 minutes of receiving photographs, Navy's first-phase photo interpreters had their reports on number, type and size of Jap vessels in the hands of intelligence and operations commanders. A strike sent out as a sequel to this report resulted in the loss of considerable Jap shipping.



ENLARGEMENT OF PHOTO (BOTTOM OF OPPOSITE PAGE) INDICATES ACCURACY OF AIM ON TARGET

ARROW INDICATES SECOND TANKER JUST PRIOR TO ATTACK

SAME TANKER, ROCKED BY NEAR MISSES, RECEIVES DIRECT HIT

DID YOU KNOW?

Blimp Warns of Land Fire

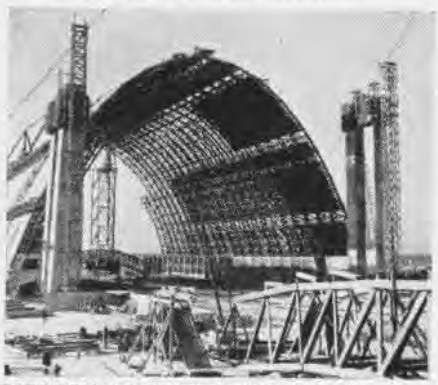
Message Dropped in Dixie Cup

SQUADRON 11, FLEET AIRSHIPS ATLANTIC.—To the many jobs of the Navy's lighter-than-air craft add one more: Firefighter. The chief of the fire department at Hingham, Mass., recently sent a very appreciative letter following the discovery of a forest fire by one of this squadron's blimps.

When the pilot and co-pilot observed the fire, they placed a message in a dixie cup, used an apple for ballast, and dropped it on the lawn of a nearby farm house, from which the message was forwarded to fire headquarters. The fire was in a very inaccessible location, and probably would not have been discovered before the next morning.

Navy Builds Air Docks

Wooden Structures Roomy Enough for 10 Grid Games



PREFABRICATED HOMES SHELTER NAVY BLIMPS

New airship docks being built by the Navy to house antisub patrol blimps on both Atlantic and Pacific coasts will be the largest clear-span buildings in the world. They are made of wood because of the steel shortage. High as a 17-story building, with dimensions of more than 1,000 feet long, and nearly 300 feet wide at the base, they are big enough to accommodate 10 football fields.

Beams for the structures are prefabricated at lumber plants in the Pacific Northwest and assembled at the blimp bases.

Nazi Prisoner Sense Reveals Expected Loss by Capture

Outlines Secret Information, Threatens Later Penalties for Violations

PERHAPS the German High Command, in its halcyon days of conquest, never anticipated any wholesale surrender of its warriors. But that substantial loss by capture was expected is obvious from security instructions carefully given its troops.

German soldiers are instructed implicity, when prisoners, to reveal nothing except their name, rank, and serial number, as pointed out by U. S. Army's *Intelligence Bulletin*. They also are cautioned that any other information may (and must) be refused. Elaborating on these basic points, Nazi captive doctrine includes the following orders:

1. If you believe you are in danger of being captured, destroy all papers that you have on your person. Above all, tear out page 4 of your *Soldbuch* (pay book), which mentions your unit.

2. If you are captured, be strictly military and, at the same time, polite. Don't be influenced by friendliness on the part of the enemy, or by threats.

3. Never speak the enemy's language.

4. Always remember that the most trivial things, to which you attach no importance, can often give valuable information to the enemy.

5. No interest in technical questions is to be shown, not even when the questioner tries to provoke an argument by belittling German weapons.

6. Don't try to deceive by false answers.

7. Don't let yourself be fooled by an assumed knowledge, on the questioner's part, of the subject under discussion.

8. Don't discuss military matters or details of operations with your fellow prisoners.

In North Africa the German Army regarded the following information as especially valuable to the United Nations, and warned its troops that they must take every precaution to keep it secret:

1. The unit to which you belong, and its location.

2. The effectives of your unit, and its losses.

3. The other units which belong to your regiment or your division. The other units which were engaged at the same time as yours, and their effectives.

4. When, and by what means, you arrived in the theater of operations, what you saw on your way, and when you had your last leave.

5. What weapons the German Army has, whether you have seen any new ones, and if and when new or repaired tanks may be expected to arrive.

6. The morale of German troops; details regarding supplies and matériel.

7. The morale at home; the effect of United Nations bombing.

The Germans caution their troops not to believe that better treatment will be given them if they consent to talk. It is stressed that even after a soldier has been interrogated, he must be careful when talking to other comrades in the camp, because of the possibility that a listening apparatus may have been installed. Troops are warned that strangers in German uniforms may try to win their confidence, and that these strangers will certainly be spies. Speaking over the radio, making phonograph recordings, and writing of war experiences are strictly forbidden.

Of special significance is the German Army's threat of future punishment if these orders are not fully obeyed:

Every prisoner remains a German soldier. You must realize that after your return you will, if necessary, be called upon to answer for your behavior during your time of captivity.

The Navy's booklet *Prisoner Sense*, prepared for naval aviation training, offers an interesting comparison of rules for capture conduct.

NATS Rushes Cruiser Gear

Repair Part Flown 5,300 Miles

Naval Air Transport Service won new speed laurels recently by transporting a 6,000-pound reduction pinion gear from Philadelphia to Recife, Brazil, in 34½ hours flying time.

The part was needed to repair a light cruiser disabled at Recife. The 5,292-mile flight took less than 3 days total elapsed time. Three 3-man crews were required to handle the Douglas R4D transport on the trip.

So heavy was the load that the plane could carry only half of its normal gasoline load. The gear was stowed on one side of the fuselage and gas tanks on the opposite side of the plane filled to offset the weight.

To keep the gear from shifting around and throwing the plane out of control it was securely lashed and a flight orderly assigned to keep a full-time watch over it. Nine stops were made to refuel. At two of them new crews were taken aboard.

Tender Named "Whiting"

Officer Posthumously Honored

A seaplane tender now building at the Seattle-Tacoma Shipbuilding Co. will bear the name U. S. S. *Kenneth Whiting* in honor of the late Capt. Kenneth Whiting, USN (retired), who died April 24, 1943, after a distinguished career in the fields of aviation and submarine operations.

This is the second posthumous honor to be conferred on Captain Whiting. An auxiliary air station at Milton, Fla., was recently designated Whiting Field.

Rain Repellent Available

For Vision in Rainy Weather

Rain repellent material now manufactured by Lorr Laboratories to maintain clear vision through aircraft windshields during flight in rain, is available at all air stations and major supply depots. Laboratory and flight tests have demonstrated that the repellent, when properly applied, greatly improves visibility during flight in rain. Service activities having facilities for applying rain repellent at the required temperature of 65° or higher may find it useful during adverse weather conditions.

Considerable research has been conducted by the Naval Research Laboratory on an improved rain repellent material. Laboratory and flight tests indicate that the new rain repellent is easier to apply and is slightly superior to the material manufactured by the Lorr Laboratories. The new rain repellent, it is believed, will be ready for distribution when supplies of the present material have been exhausted. If quantities of the new rain repellent are desired in the near future, it is suggested that a dispatch indicating quantity needed be sent to BuAer.

New Waterproof Envelopes

Will Protect Papers Enclosed

CONTAINER IS DESIGNED FOR WIDESPREAD USE

Waterproof envelopes of a new type which completely protect enclosed papers even though they are submerged totally in water, have been perfected and will be used to contain shipping documents on all consignments of materials to overseas bases. Heretofore waterproof envelopes have been used, but to a greatly restricted extent.

Snake Bite No Worry

Tropical war areas have poisonous snakes and vines but a person's chances of being injured by them is no greater than in some parts of United States, according to Dr. E. D. Merrill, botanist, quoted in a BuMed news letter.

"Venomous sea snakes are unable to bite a human being because their mouth parts are shaped for eating small fish," he said.

"The chances of snake bites are probably less in Melanesia than on the Palisades along the Hudson River.

"Vines with stinging hairs and needlelike whiskers are bothersome, but not dangerous; they are found only in primary forests.

"There are several species of plants that produce an irritant juice similar in its action on the skin to our poison ivy. The chances of contact poisoning are less in the Old World Tropics than in New York State."

BEST ANSWERS

VII—Emergency Drills

Pick the best choice to complete the statements below, then check your answers on p. 32.

1. During abandon ship drill the officers who are to take immediate charge of embarkation, one on each side of the ship, are the—

- ☐ *a* navigating officer and gunnery officer
- ☐ *b* engineer officer and first lieutenant
- ☐ *c* navigating officer and engineer officer
- ☐ *d* gunnery officer and first lieutenant
- ☐ *e* executive officer and gunnery officer

2. You are on board a carrier and hear the following calls: general alarm, abandon ship on bugle, double time on bugle, and the boatswain's pipe "all hands abandon ship." This signifies that—

- ☐ *a* ship may have to be left without even time to lower boats
- ☐ *b* provisions and gear will be taken off in boats
- ☐ *c* the signal officer takes rockets, Very's pistol, and signal stars
- ☐ *d* the first crew shall be provided with medical boat box and four buckets for bailing
- ☐ *e* the assistant navigator takes chart and navigation gear

3. The abandon ship bill shall not provide for—

- ☐ *a* having all hands provide and put on life jackets
- ☐ *b* getting boats and rafts out and embarking as quickly as possible
- ☐ *c* getting out, manning, provisioning, and equipping boats and rafts
- ☐ *d* making two or more trips with the boats
- ☐ *e* a party to prepare auxiliary lighting arrangements

4. Every officer and man aboard ship must occupy his battle station at—

- ☐ *a* all emergency drills
- ☐ *b* abandon ship drill
- ☐ *c* the general alarm
- ☐ *d* collision drill
- ☐ *e* general quarters

5. The general alarm sounded by gongs and followed by one long blast of the siren indicates—

- ☐ *a* plane crash and salvage
- ☐ *b* abandon ship
- ☐ *c* collision
- ☐ *d* clear ship for action
- ☐ *e* a fire during general quarters

6. First requirement for successful drill is—

- ☐ *a* knowledge of duty
- ☐ *b* speed
- ☐ *c* silence
- ☐ *d* developing precision
- ☐ *e* an intelligent crew

Giant Stratosphere Planes

True stratosphere planes that will climb at a rate of 4 miles per minute out of sight of ocean and land are visualized as definite post-war possibilities by Waldemar Kaempffert, Science Editor of The New York Times, in a booklet issued by the Public Affairs Committee, Inc.

"We certainly have every reason to expect that planes for 150 passengers will appear soon after the war," Mr. Kaempffert says. Although he believes there is a limit to the size of an airplane, he says that it would be rash to dismiss 250- to 650-ton leviathans as impossible.

"A dozen of those could carry as many passengers on the North Atlantic run to Great Britain as were carried first-class by all steamers in an average year between 1928 and 1938. Two such planes flying every day in each direction could carry 200,000 persons a year. The *Queen Mary* can carry only 90,000 in 48 possible annual voyages, without allowing for the time that should be spent in drydock. Frequency of schedule rather than a range of 10,000 miles or more is the key to future operations of commercial planes."

How AVIATION TRAINING LITERATURE Is Being Distributed to NAVY and MARINE CORPS

In order to effect a better distribution of Sense Pamphlets and other Training Literature publications, the following plan has been established.

Operating Squadrons will receive copies from Information Centers through established Air Information channels. Arrangements have been made with the Air Information Division for shipment of quantities of pamphlets and publications to central Air Information Offices listed below. These Centers will distribute copies to all squadrons in their areas. A limited quantity of all publications will be maintained at the Centers for information and use by new squadrons in the area which may not have been included in original distribution.

Operating Commands will be mailed information copies. Single information copies of pertinent literature will be sent direct to Air Force, Fleet Air, Air Group, Marine Aircraft Wing, Fleet Air Wing Commanders, CASUS and HEDRONS to insure the fact that all cognizant officers may be informed as to publication and distribution, should they wish to advise their Air Information Offices to make any special allocation of quantities. Other ships from which naval aircraft operate will receive copies from nearest Naval Air Combat Information Office.

CV, CVL, CVE will be shipped pamphlets and publications direct through Air Information Division channels.

Naval Air Operational Training Command squadrons will receive pamphlets and publications from NAOTC Air Information Center at Jacksonville. Marine Operational Bureau to facilitate delivery. Information copies will be sent to the commands and staff officers having cognizance of the subject material.

Naval Air Intermediate Training Command shipments of pamphlets and publications will be made to Naval Air Training Centers at Pensacola and Corpus Christi for distribution to activities in these centers. Information copies to command and staff officers.

Naval Air Primary Training Command units will be shipped quantities of pamphlets and publications direct, as allocated by NAPTC, or on individual request through regular channels.

Naval Air Technical Training Command units will be shipped quantities of pamphlets and publications as allocated by NATTC.

NAS, MCAS and CGAS in Air Center Areas will be mailed single information copies and may secure any additional copies required through Air Center handling distribution in the area.

NAS, MCAS and CGAS Not in Air Center or Air Information Area will be shipped pamphlets and publications direct, and in quantities as requested.

Naval Airship Training Command will be sent information copies and quantity distribution will be made to training activities as allocated by NATC.

LTA Operating Units and NAS will be sent information copies and shipped quantities on allocation by Administrative Commands or on request.

Free Gunnery Units, Miscellaneous Training and Operating Units, INAS, Etc. will be sent information copies of pertinent literature, and quantities on request, or allocation by cognizant Bureau authority.

CENTRAL DISTRIBUTION POINTS FOR SQUADRONS

Officer in Charge of Naval Air Combat Information Attached to the Following Commands

Air Force Atlantic Fleet
Fourth Fleet
Moroccan Sea Frontier Forces
Air Force Pacific Fleet
Fleet Air South Pacific
Fleet Air Seattle
South Pacific Force (3rd)
Naval Air Operational Command
Third Marine Aircraft Wing
Caribbean Sea Frontier
Fleet Air Wing 16
NAS Coco Solo
Fleet Air West Coast (also source for Marfairwest Coast)
Fleet Air Alameda
North Pacific Force
Southwest Pacific Force (7th)
NAS Clinton

Special distribution to—

Naval Training Centers
Naval Air Training Center Pensacola
Naval Air Training Center Corpus Christi
Naval Air Technical Training Centers

Note.—*The above Central Distribution Points are primarily for servicing SQUADRONS as outlined. Quantities will vary depending on publication from two copies per squadron up. Other activities will be serviced as noted above. Additional copies may be secured from Central Distribution Points or by addressing requests to: Deputy Chief of Naval Operations (Air).*

TOKIO TALKS

Tokio is conducting an extensive campaign with all propaganda media to proselyte for the Japanese ideology among occupied countries. This column is gleaned from radio broadcasts picked up by monitors in various parts of the world and made available now to NAVAL AVIATION NEWS.

—To U. S. and Latin America:

"Today Japan and the countries of the co-prosperity sphere are no longer in need of gasoline, even though their shipping lanes be harassed by the enemy. For it is a fact that gasoline is now being loaded in barrels made of teakwood and thrown into the sea. These will be carried by the Black Current [Japanese Current—Ed.] to be washed ashore on the Japanese islands.

"No matter if these barrels are loaded on ships that have been torpedoed and sunk, the barrels would keep afloat. Thus, so long as the Black Current maintains its usual course as it has done for thousands of years, Japan will never suffer a shortage of gasoline."

—To Southern Europe

When the news "spread" *in Japan that American university students were taking flying courses, Japanese students immediately* "demanded" *the same privilege.* "It is a very sure fact which absolutely nobody can deny that the fate of these last battles is decided by the air forces which occupy a place of fundamental importance in any war action." *With American students fighting in the skies,* "tens of thousands" *of requests written in blood poured into the army and navy. Training for flyers is speeded up so they can go into the air within just a few months.*

—To Japan

"Our air force is anticipating the destruction of the enemy air strength on the China continent. Our forces are achieving great results in attacks on enemy bases, and in the interception of enemy planes which are persistently coming out to attack."

—To North America

"A special wood and steel ship has successfully completed its maiden voyage with full cargo from Osaka to Shibaura. It is a 300-ton ship of the Tatsuma Coastal Steamship Co., built by the Osaka Wood & Steel Shipbuilding Co. A third of the materials used in the ship were steel, a half were wood."

—To Mexico

The latest Chishima raid ended in "disastrous failure. Inasmuch as since the first raid last year, our antiaircraft defenses have been consolidated and are now perfect, if the Yankees again try such an adventure they will not fail to multiply their disasters."

SHOW ME THE WAY TO GO HOME

Air Plotting Problem

Mid-Lat. 15°–00′ S **Mid-Long. 179°–00′ W**

Your VO section is launched from the USS *Iowa* at 0600 with orders to track your section leader on a scouting mission. At 0600 the USS *Iowa* was in latitude 16°–40′ S, longitude 178°–35′ W, on course 035, speed 28 knots. Mean variation 10 E.

You are airborne at pressure altitude 3,000 feet at 0615 and take a wind star with the following results: (your strut thermometer reads (+) 5° C.):

MH 200	CAS 106 k	Drift 6 L
MH 138	CAS 106 k	Drift 13 L
MH 067	CAS 106 k	Drift 5 L

1. What is the wind? From _____ Force _____

You depart from over the USS *Iowa* at 0630, and track your section leader on a magnetic heading of 280° calibrated airspeed 106 k.

2. What is your 0730 no wind (air) position? Lat. _____

Long. _____

3. What is your 0730 dead reckoning position? Lat. _____

Long. _____

You maintain heading and airspeed until 0800. At 0800 you change heading, maintaining altitude and airspeed.

At 0800 your magnetic heading is 023.

At 0836 your magnetic heading is 094.

At 0848 your magnetic heading is 352.

4. What is your 0936 no wind (air) position? Lat. _____

Long. _____

At 0936 you obtain a fix over Sherman Atoll, latitude 13°–04′ S, longitude 179°–02′ W.

5. What has been the average wind? From _____

Force _____

You climb to 4,000 feet and check the wind at that altitude, and find it to be from 345°, force 30 k. You depart Sherman Atoll at 0945 to intercept the USS *Iowa*. Calibrated airspeed 114 k, air temperature (+) 3° C.

6. What is the magnetic heading? _____

7. What is the Estimated Time of Interception? _____

At 1027 your section leader is forced down because of engine failure.

8. What is his bearing and distance from the USS Iowa?

Bearing _____ Distance _____ miles

(Answers on page 29)

Marine Corps AVIATION

Marine Air Arm, Though Relatively Small, Is a Versatile Organization Specializing in Landings, Support of Surface Forces, and Inland Warfare; Corps' Third Aircraft Wing Now Is Being Outfitted

MARINE aviation units were organized to support the Fleet Marine Force, a mobile, seagoing force of fighting Marines trained as specialists in landings. Continuous practice has been necessary to effect the perfect coordination as demonstrated by the Marines on the surface and in the air. Inland warfare calls for an entirely different type of training inasmuch as air objectives differ greatly from those in landing operations.

Although the Marine air arm is a relatively small organization when compared with Army and Navy air forces, expansion under the present program will bring it to a full one-third of the total Marine Corps. In turn, the Marine Corps by law must be one-fifth the strength of the Navy. Reserve officers make up the greatest portion of Marine Corps pilots.

Under the Navy's expanded plane program, the Marines have two aircraft wings. A third aircraft wing is being formed, and a fourth Marine Base Defense Wing has gone into operation. Each wing is divided into five air groups of several squadrons each.

The corps' tactical fighter squadrons are composed of 18 planes, 18 pilots, 2 spare planes, and 18 extra pilots. Officers total 47, men 242.

Squadrons are divided into departments headed by squadron commander, executive officer, flight officer, gunnery officer, adjutant and ground defense officer, communications officer, intelligence officer, and mess and transportation officer. The adjutant is the Marine counterpart of the personnel officer in Navy squadrons.

Typical Marine squadrons are fighter and scout bomber. The latter type is organized after the plan of the fighter squadron with the same number of planes and officers, although more enlisted men are required since each craft uses a rear seat radio gunner. In the case of scout bombing squadrons, it has been found necessary to have as many extra gunners as extra pilots.

Twelve planes make up a horizontal bombing squadron, together with two pilots, radioman, bombardier, and two gunners—one for the .30 caliber tail stinger and one for the .50 caliber turret—in each plane. Usually there are 54 aviators and approximately 358 enlisted men.

Utility squadrons are made up of 12 planes and 63 pilots. Each crew consists of a pilot, copilot, crew chief, radioman, and navigator, each plane being capable of carrying 28 men including crew. Enlisted personnel attached to VMJ squadrons totals 335.

The newer VMTB squadrons are composed of 18 planes and 40 pilots. Observation squadrons have 18 fighter planes, photographic squadrons 12 (6 photographic fighters and 6 multiengined planes), and night fighters 12.

The corps uses few seaplanes and not a great number of large bombers and patrol planes. Some large transports, however, are used by utility squadrons. Craft now generally used in combat areas are the F4F, F4U, SBD, TBF, PBY5A, PB4Y, and R4D.

New reserve pilots for the Marine air arm are selected from the crop of naval aviation cadets undergoing intermediate training at Pensacola and Corpus Christi. It is at this point in a naval aviation cadet's training that he may apply for a commission in the Marine Corps.

Upon being commissioned a second lieutenant in the Marines, the trainee's program continues at a Naval Air Operational base with emphasis on formation flying, gunnery, and combat maneuvers. The new officers are then assigned to a permanent duty station.

A limited number of regular officers are selected each year for duty as Marine aviators. They have usually had from 2 to 4 years of service with the ground forces of the corps and average 25 years in age. Experience has shown that knowledge gained through association with the ground forces is tremendously valuable.

Enlisted men selected from the corps' ranks each year for flight training enter the program with naval aviation cadets in the primary training phase, progressing through intermediate to operational.

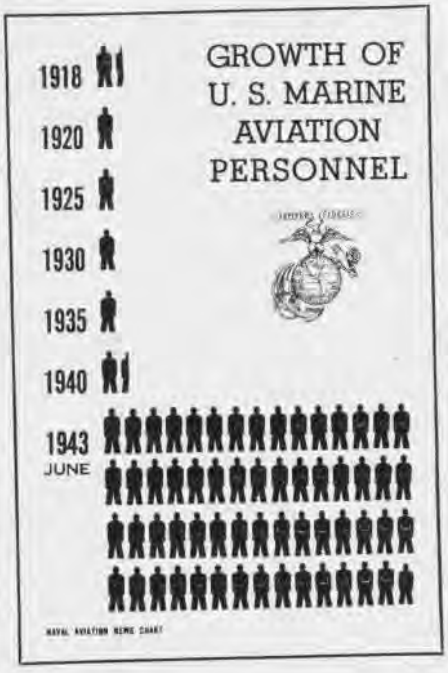
The corps does not conduct flight training schools of its own, except the multiengine school at Cherry Point, N. C., which offers advanced work.

Marine fliers, upon completion of their training, may express preferences for type of duty desired, although there is no guarantee that they will be selected for the assignment requested. Some are assigned to Marine Corps Air Stations where they may both fly and handle administrative matters; some become instructors at Naval Air Stations; many others go to one of the Marine aircraft wings to be employed in combat operations.

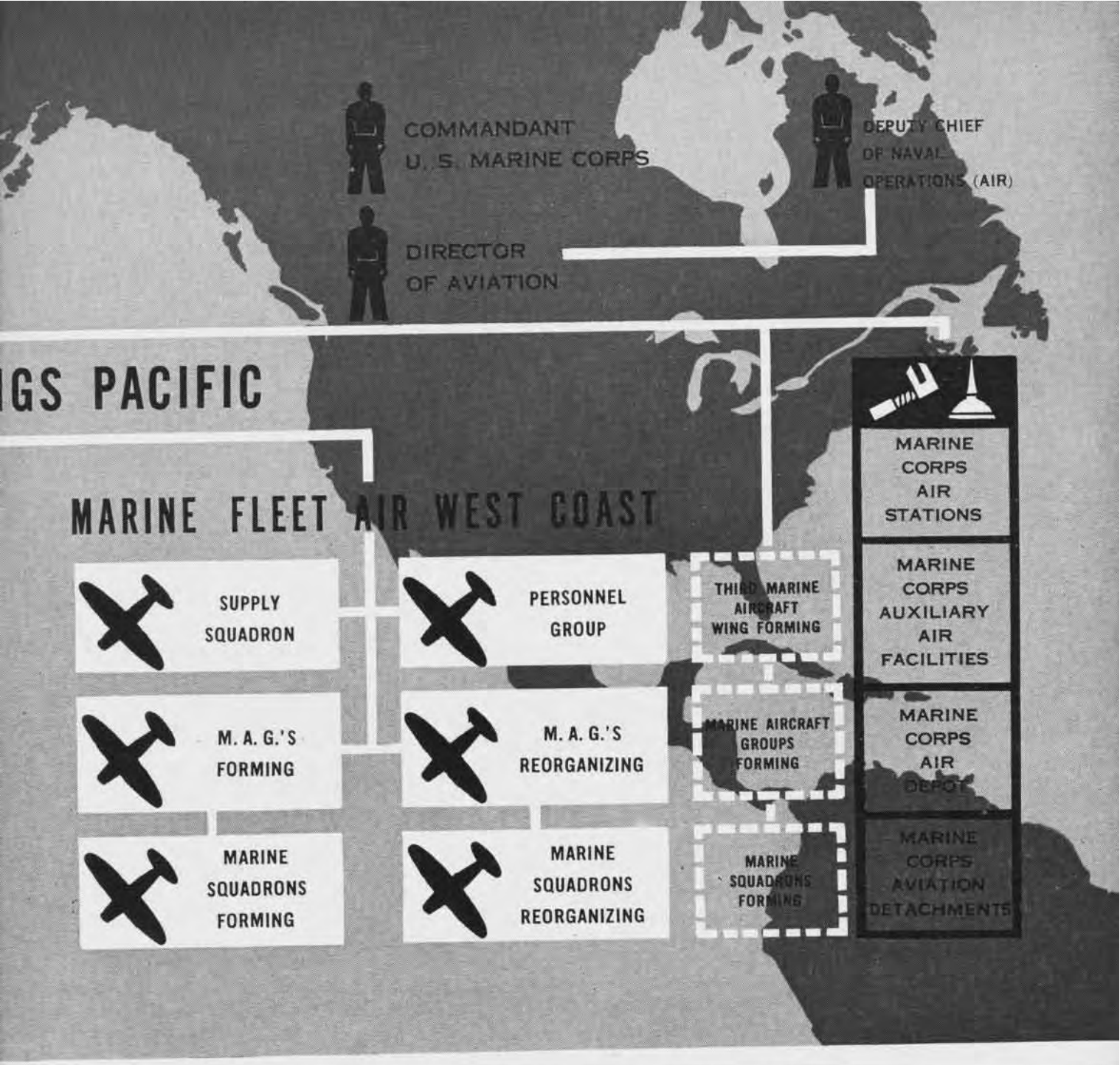
Marine aviation is charged with the operation and maintenance of its planes, engines, and equipment. Two large overhaul bases, one on each U. S. coast, are supplied with complete shop equipment and trained personnel.

The most important Marine Corps Air Stations are located at Cherry Point, N. C.; Parris Island, S. C.; Quantico, Va.; St. Thomas, Virgin Islands; Kearney Mesa, San Diego, Calif.; Santa Barbara, Calif.; Mojave, Calif.; El Toro, Calif.; El Centro, Calif.; and Edenton, N. C.

Funds for the corps are derived from appropriations for the Navy, and the aircraft are purchased by the Bureau of Aeronautics. Planning units within the Navy Department are advised as to the corps' needs by the Division of Aviation, the headquarters administrative body of the Marine air arm.




SEMPER FIDELIS
ORGANIZATION OF MARINE AVIATION
MARINE AIRCRAFT
MARINE AIR SOUTH PACIFIC
FIRST MARINE AIRCRAFT WING
SECOND MARINE AIRCRAFT WING
MARINE AIRCRAFT GROUPS
MARINE AIRCRAFT GROUPS
MARINE SQUADRONS
MARINE SQUADRONS
MARINE AIR BASE SQUADRON
MARINE AIR DEPOT SQUADRON
MARINE AIRCRAFT REPAIR & SALVAGE SQUADRON
SCAT (MAG. 25)
FOURTH MARINE BASE DEFENSE AIRCRAFT WING
MARINE AIRCRAFT GROUPS
MARINE SQUADRONS
NAVAL AVIATION NEWS CHART


COMMANDANT
U. S. MARINE CORPS
DEPUTY CHIEF
OF NAVAL
OPERATIONS (AIR)
DIRECTOR
OF AVIATION
IGS PACIFIC
MARINE FLEET AIR WEST COAST
SUPPLY
SQUADRON
PERSONNEL
GROUP
M. A. G.'S
FORMING
M. A. G.'S
REORGANIZING
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THIRD MARINE
AIRCRAFT
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AUXILIARY
AIR
FACILITIES
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AIR
DEPOT
MARINE
CORPS
AVIATION
DETACHMENTS

SKY CHASE

THE MARINES WERE IN AVIATION EARLY

MARINE Corps aviation started in the days of the Wright brothers, mostly the dream of one man—Albert A. Cunningham—who took a balloon ride as a boy in 1903 and thereafter made flying his life's goal. By 1909 he was in the Marine Corps and was haunting flying fields. Soon he acquired a part interest in an airplane which never got off the ground.

Cunningham began a campaign for a Marine flying corps and by 1912 he was sent to the Navy's aviation camp at Annapolis. In addition to being the Marines' first aviator, he was naval pilot No. 5.

CUNNINGHAM

When the United States entered the first World War there were only five Marine pilots—Bernard L. Smith, William M. McIlvain, Francis T. Evans, Roy S. Gieger, and Cunningham.

In First Catapult Plane From Ship

Cunningham added another first to his record in 1916 when he piloted the first plane catapulted from a warship under way. The attempt, in a flying boat, was a failure owing to faulty working of the catapult; but the idea stuck.

Marine Aviator Evans was the first man to loop a seaplane in 1917, and brought his plane out of a spin which he had caused intentionally by whipstalling his craft. Up to then it had been thought impossible to loop a seaplane or cure a spin.

EARLY TRIALS ESTABLISHED CATAPULT METHODS

The first Marine air activity of any size began in 1917 when the corps' aviators began training in land plane flying at the Mineola Army air station. Cunningham, the year before, had become the first Marine or Navy man to fly a land plane when he went to San Diego Army flying school.

Marines Given Five Airplanes to Fly

When the first Marine aeronautic section went into flight training at Philadelphia Navy Yard in 1917, it was assigned two Curtiss pushers with tricycle landing gear, two R–6 Curtiss seaplanes, and an old Farman for training. During the war, the Marines tried out several types of aircraft—Thomas seaplanes, Curtiss flying boats, Galladet seaplanes and others.

First ground courses were taught at Massachusetts Institute of Technology and by March 1918 the corps received its own flight instruction at Miami. The Corps had 5 officers and 30 men in its air arm when the war started and by 1918 it had 282 officers and 2,180 men.

Even then the Marines went to sea for their active aerial work, the first unit going to Azores for antisubmarine patrolling and the rest of the aviation section operating off Miami and Cape May, N. J. Such activities were not exciting enough for the Marines so they were given the job of flying with British and French planes.

Marine Pilots Operate in War Zones

In their patrol work the Marines were flying Curtiss R–6 and Navy N–8 seaplanes and over the western front they used also DeHaviland DH–4's. Like all other war operations, Marine aviation took a drop after the war, but did not die out entirely.

Dive-bombing was an unheard-of technique until the Marines perfected it during their operations against Nicaraguan bandits in 1927. Their fliers had been playing with the idea since as early as 1919 in Haiti, and some fliers believe those experimental dives in Haiti were the beginning of modern dive-bombing.

Marines Patrol China Battle Areas

Marine aviators from Guam were sent to China in 1927 to help Marine forces on the ground, doing mostly reconnaissance, keeping U. S. forces informed of the activities of the opposing Chinese armies so the Americans could be on guard in case of attack. They made 3,800 flights on this job.

Three of the first five Marine aviators are still on the active lists. Colonel Smith, who was No. 2, is naval air attaché at Guatemala; Colonel Evans, the fourth Marine to fly, is commanding officer of the Marine barracks at Norfolk. Major General Geiger, after commanding Marine fliers at Guadalcanal, now is director of Marine aviation in Washington, D. C.

Women Marines

LIKE the Army and the Navy, Marine Corps aviation has its own Women's Reserve branch, whose goal is 9,000 members trained to take over a large portion of the jobs necessary to keep Marine aircraft flying.

Right now the whole MCWR has 8,500 women in uniform of whom 2,000 have been assigned to aviation duties. As the corps increases and training schools turn out more specialists half of the total strength of the corps will be in aviation work.

Some 800 women are now going to specialists' schools learning the trades which will help them relieve a marine for front-line duty. Control-tower operators are being trained at Atlanta, aviation machinists' mates at Norman, aerographers at Lakehurst, radio operators at Miami University, parachute riggers and repairwomen at Lakehurst, and link-trainer instructors at Atlanta.

Other jobs which Marine women are filling include aviation storekeepers, supply clerks, cryptographers, telephone and teletype operators, carpenters, electricians, draftswomen, metalsmiths, painters, clearance-center clerks, photographers, motion-picture-projector operators, stewardesses, beauticians, GunAirStructors, truck and automobile drivers, general clerical work, cooks, bakers, and mess attendants.

ALL MARINE CORPS AVIATORS HAVE HAD FLIGHT TRAINING AT NAVAL AIR STATIONS; SOME PILOT PBY5-A'S ON RESCUE PATROL

FOUR JAP TRANSPORTS BURN NEAR GUADALCANAL AFTER MARINE FIGHTER ATTACK. BELOW MARINES LOAD WOUNDED MATE IN PLANE

AIR SICKNESS

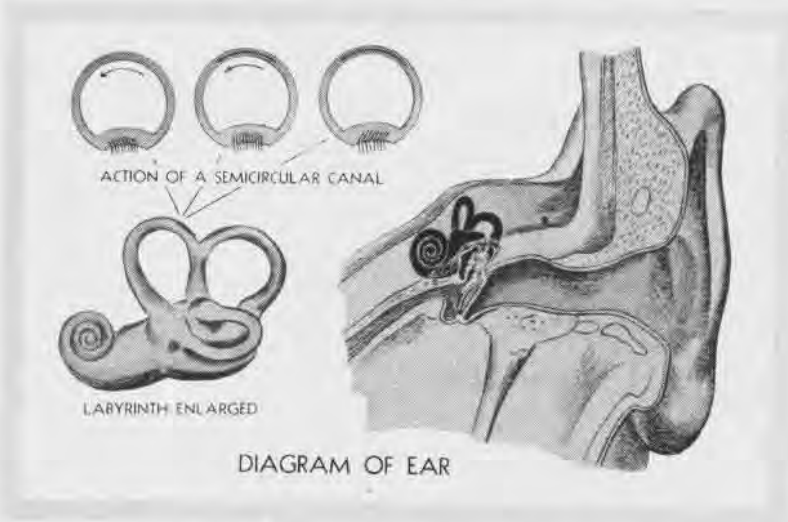


DIAGRAM OF EAR

PRINCIPAL CAUSES OF AIRSICKNESS

1. The inner ear, reacting to very long movements, or to long and violent motion, causes airsickness. Violent motions themselves do not affect the inner ear because each motion has a compensating "unwinding" movement.

2. Eyes are sometimes a factor; a natural twitching is set up when the inner ears are disturbed. Eyes should be kept focused on a distant object, and during acrobatics should be kept out of cockpit except for occasional glances.

3. Physical condition is important: a man can count on being airsick after a hangover. Fatigue, constipation, and overeating are other causes. Certain foods, such as greasy or bulky foods eaten before flight, are not good.

4. External factors affect ability to withstand airsickness. High altitude may cause nausea. Insufficient ventilation is bad because it does not reduce body heat. Bad odors, constant noise, and extremes of temperature are other factors.

5. *Suggestion:* Fear or expectation of becoming airsick may be the cause. It's easier for the cadet who has once been airsick to become airsick again, merely from an association of ideas. He keeps thinking about getting sick until he actually is.

6. Improper training is an important factor. The instructor who introduces an aviation cadet to repeated acrobatics too early may be contributing to a condition of chronic airsickness. Rough flying should come in small doses.

HOW TO PREVENT OR MIMIMIZE AIRSICKNESS

1. Forget airsickness: think about your mission.
2. Flex head onto chest when flying in rough air.
3. Introduce student to acrobatics gradually.
4. Don't turn your head in steep banks.
5. Keep eyes on horizon when possible.
6. Sit near plane's center of gravity.
7. Stay healthy: mouth shut, bowels open.

ANYONE who flies can become airsick—whether he is a novice being initiated in a "Yellow Peril" or an old-timer with several thousand hours of flight time under his belt. But in ordinary cases, airsickness can be cured or prevented by an understanding of what causes the condition.

The causes of airsickness are both physical and psychological. Only a small number of pilots-to-be can't do anything about it, but after a flyer becomes accustomed to sudden movements of bumpy air and prolonged spinning or rotation, he shouldn't have to worry about becoming sick.

A contributing cause of airsickness lies in the "inner-ear," which contains three semicircular canals, the main sensory organs used by a person to orient himself in space. When a pilot is sitting in a normal position in the cockpit, the canals lie in three different planes, coinciding with the principal axes of an airplane, so that any movement affects at least one canal. Each canal contains fluid and tiny hair "communicators" at the base. When the plane is making unusual or prolonged movements, especially up and down, a series of conflicting impulses are relayed to the brain, because the fluid lags or continues to move in one direction even after the plane has begun to move in another direction. The hair communicators, in other words, can't keep up with the plane's movements, or send false information to the brain. They send the same information to the stomach, causing nausea. The inner ear can be educated out of airsickness by training.

Training against airsickness takes time and instructors should try to keep a cadet from becoming sick while getting used to unusual movements.

During early training a student pilot may develop an aversion to flying, and he may even develop chronic airsickness, because he has been subjected too soon and too often to rough flying or acrobatics. It is no compliment to an instructor that his student becomes airsick, and it has even been suggested that the instructor be made to clean up the plane when a student becomes sick.

If the causes of airsickness are physical, in many cases the student pilot can "learn" to overcome them. If they are psychological, a thorough understanding of these causes will help to alleviate them. External conditions tending to cause airsickness should be removed.

SHORE STATIONS

NAGS, JACKSONVILLE.—The Naval Air Gunners School at Yellow Water has celebrated its first anniversary. From what was once a wild, swampy hang-out for rattlesnakes, alligators, and Florida mosquitoes, NAGS has become an outstanding example of modern standards of living and housing more than 2,000 officers and men, comfortably, healthfully. Miles of paved road, electric and phone lines, an up-to-date electric galley and ample recreational facilities all point toward the hard work of the training officers. Ship's Company should also receive a big hand in the development of Yellow Water.

NAS, MINNEAPOLIS.—WAVES at this station have a title bestowed on them by admiring bluejackets—*The Paradise Fleet.* A new nickname for the W. R. officers, not found in the books, is *Bluebraids.*

Here are a few of the terms, old and new, which have a new twist in WAVE talk:

The unlucky lovers who try their luck on a blind date are said to go *Blind Flying. Convoys* are dates, while an ensign's date is an *Officer's Mess.*

WAVES are learning to ask for *Schooner on Rock* when they want roast beef and potatoes. Breakfast offers *shingles,* or toast, with their *Java.* It's not salt to them any more but *Sea Dust.*

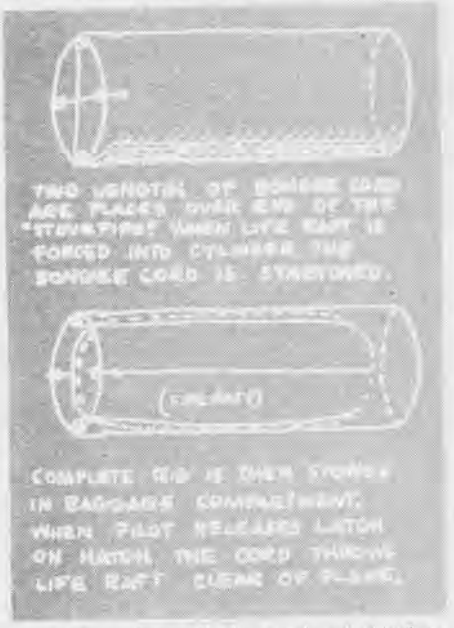
NAS, NORMAN.—Three hundred boots, known as *Tarmacs,* have reported for indoctrination at this station. Eventually these men, who were sent here from the Cadet Selection Boards all over the country, will become cadets. Right now they are seamen, second class V–5, and will remain in that status for the duration of their aerial boot school course here, approximately 3 months. The name *Tarmac* is a contraction of tar and macadam, materials used as runway pavement at British flying bases during the last war. Because they worked on the tar macadam as machinist's mates and general flunkies in the early stages of flight training, the World War I pre-flight students were tagged with the *Tarmac* label.

NTS, GREAT LAKES.—Sailors at Great Lakes, the world's largest Navy training station, don't get into trouble often, but when they do it is almost always the fault of a woman.

So says a disciplinary officer at this training station. He reports that in the last year less than one-half of one percent of the sailors at Great Lakes were brought before officers for disciplinary action. Nearly all of those cited were charged with being away without leave or with overstaying a leave.

"In 90 percent of the AWOL cases, a woman was to blame," he says. "Wives, mothers, or sweethearts would write asking the boys to come home, frequently giving some imaginary reason." Disciplinary action was needed most with the 17- and 18-year-old sailors.

NAS, PENSACOLA.—Navigation airplanes and chase pilots on gunnery hops at one NATC Squadron here are equipped with a two-man life raft launched by remote control similar to a target sleeve release.



A stovepipe cylinder made of dural or some other noncorrosive metal serves as the barrel of the "gun" which shoots the life raft out of the baggage compartment of an SNJ–4.

Motive power is supplied by two ¼-inch strands of bungee cord. The cord is stretched when the raft is forced into the baggage compartment and the hatch is secured. A control line from the latch to the cockpit allows pilot to open the hatch. When the line is pulled, there is enough strength in the stretched cord to project the raft clear of the plane.

The purpose of the metal cylinder is to provide a smooth surface for the raft to slide on, thus preventing it from catching on anything when the latch is sprung. Actual runs have proved very satisfactory, the Squadron reports. Blueprints are available at the A&R Department.

NAS, LIVERMORE.—The A&R Department has been experimenting for about 4 months with the use of sour clover seed instead of sand in the blast cleaning of certain aircraft engine parts. Use of this seed or baked cracked wheat obviates the necessity of making aluminum alloy parts as there is no abrasive action, thereby saving many man-hours. Parts cleaned by this method include cylinders, pistons, master and articulated rods, exhaust elbows, and valves after degreasing and hot tank cleaning with specification C–86b compound. Carbon removal is effected with a minimum of hand scraping or polishing.

No modification of the sand blast machine is required as best results were obtained with an 80-pound air supply through a standard ⅜-inch nozzle. If sour clover seed is used it is required that both the work and the air supply must be absolutely dry to prevent clogging of nozzle or building of deposit of the powdered seed on the work.

One hundred pounds of the seed will clean necessary parts of four to seven engines at a cost of $5 per hundredweight.

NAS, OLATHE.—The designation "Cadet Upper Classmen" has been conferred upon men who have completed ground school but still are taking flight training. Their status is that of advanced midshipmen and it entitles them to special liberty privileges. The upper classmen have separate quarters and are expected to set an example for other cadets. They also carry out special duty assignments which call for a minimum of supervision.

NAS, PASCO.—An insurance drive, begun in May, ended recently with the sale of $1,182,000 worth of National Service life insurance. On this station 96.66 percent of the personnel is now covered by government insurance.

NATC, PENSACOLA.—Complete assurance that a student is thoroughly familiar with his plane before a solo hop is accomplished through a cockpit check-out system in effect at Saufley Field. Each student is blindfolded and must complete the check-out of 32 items within 4 minutes with no errors before he is allowed to solo.

RECORDED COMMUNICATIONS

Navy Speeds Student's Grasp of Communications by Film-Record Method Which Co-ordinates Sight and Sound; System is Used Widely in Aviation Training Schools

COMMUNICATIONS—vital to flight operation—must be thoroughly mastered by a naval aviation cadet, before he wins his wings. He must acquire a proficiency in types of communications transmitted either in Morse code or by semaphore.

During normal times, qualified instructors teach code by using separate keys and earphones for each student. Similarly, personal instruction is given in teaching semaphore. But shortage of equipment and instructors made it imperative to devise a new means of instruction. BuAer met this need by developing the film-record system now used in flight preparatory, CAA-WTS and preflight schools.

Formerly Used By Private Schools

This method has been utilized by private schools on a small scale, but where formerly only a few records were needed, the Navy program requires several hundred at each activity. Exact methods of recording make it possible to use records throughout the course without supplementing them with periods of individual instruction.

There are advantages in the new method of instruction over any other system. One is coordination of sight and sound in code and semaphore instruction. When a letter is shown on the screen in semaphore, it is also heard in Morse code. If the student has forgotten either the "look" of the semaphore letter or the sound of it in Morse code, he is certain to be prompted by one or the other. If he knows either, he can learn it readily by association.

Another advantage is that instruction may be timed in relation to the progress of the student. After the elementary stage, code and semaphore speeds increase week by week until the required standard is attained. This gradual increase could not be maintained at a constant rate by individual instructors without special equipment.

Students Get More Consideration

Still another advantage is that the slow student can be given more consideration with less effort than would have been possible under the old system. If he has work to make up, he merely runs the records again. No instructor is required regardless of the fact that a number of students need a repetition of lessons. The film-record system has the additional advantage of removing any inferior feeling the student might have if he had to ask an instructor for extra lessons.

But perhaps the two greatest advantages of the film-record method are that trained instructors are no longer required and that absolute standardization is obtained. Such standardization is not possible when transmission is subject to the personal variations which occur in even the best instructors.

The new method has resulted in another gain in the general training of aviation cadets. Formerly instructors used miscellaneous newspaper items for transmission, but now the Navy employs material which teaches the cadets rules and regulations, traditions, aerology, navigation, and other subjects in the training curriculum. Because each word is received letter by letter, the student remembers the material better than when reading it from text.

SOUND SPELLING OF MORSE CODE

E Dit	W Di Dah Dah
T Dah	B Dah Di Di Dit
A Di Dah	C Dah Di Dah Dit
M Dah Dah	F Di Di Dah Dit
N Dah Dit	H Di Di Di Dit
I Di Dit	J Di Dah Dah Dah
D Dah Di Dit	L Di Dah Di Dit
G Dah Dah Dit	P Di Dah Dah Dit
K Dah Di Dah	Q Dah Dah Di Dah
O Dah Dah Dah	V Di Di Di Dah
R Di Dah Dit	X Dah Di Di Dah
S Di Di Dit	Y Dah Di Dah Dah
U Di Di Dah	Z Dah Dah Di Dit

Flashing light, or blinker, is taught in a similar manner. The electric current which operates the speaker of the reproducing machine is fed to a neon light which shows the Morse code visually. In early stages of instruction, both sound and light are reproduced simultaneously. Later the operator disconnects the speaker so that only the light is seen.

Although Morse code is used when signalling with blinker, a somewhat different type of sending is required. Specially timed records are employed but the text sent is the same type used in code and semaphore training.

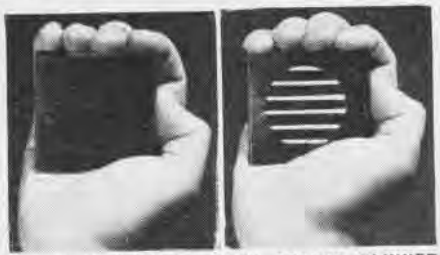
Code More Difficult Than Semaphore

While all three methods of communication are equally important, the experts agree that students experience more difficulty with Morse code, both sight and sound, than with semaphore. To combat this, the Navy has designed a new method for presenting Morse code letters. The code is understood ultimately by the complete sound of each letter, not by the individual sounds which make up the letter, and the student is cautioned not to count component parts but to learn each letter by its complete sound. Letters having the shortest sounds are presented first and so on until those having the longest sounds are introduced. Here is the sequence:

ETAMNIDGKORSUWBCFHJLPQVXYZ

As soon as the first three letters are introduced, complete words are made, immediately removing the monotony experienced when letters are presented in alphabetic sequence. As Morse code is the basis for blinker communication, practice by sound continues for two weeks only before the flashing light is introduced. After this the two are given alternately.

Semaphore signalling is taught somewhat in the same fashion but the alphabet is presented in a different sequence. Letters having adjacent arm positions are presented first; then letters made by opposite arm positions. As in code, semaphore letter positions are not in absolute rotation, and often one letter has no direct bearing on the adjacent letter in the alphabetic se-



STUDENTS PRACTICE WITH POCKET BLINKER

SIGHT, SOUND COORDINATED IN NEW METHOD

FILMS AND RECORDS AID TRAINING PROGRAM

quence. Semaphore letters are introduced in the following sequence:

ABCDEFGHIKLMNPQRSUTJYZOWVX

As in code, when several semaphore letters have been learned, words are made from the letters without waiting for the entire alphabet to be introduced. Practice continues until the alphabet is covered. Code sound accompanies much of the semaphore practice at the beginning of the course.

Slide Film Speeds up Instruction

Slide film facilitates instruction in semaphore. For each film there is a synchronized record carrying a gong signal which tells the operator when the picture should be changed. This provides for projection of the proper flag position to match the code sound on the record. The voice on the record explains each new flag position. Later in the course, all practice material is identified by voice to allow student or operator to determine progress made. When examinations by records and film are given, final identification by voice is marked in advance so that the needle of the reproducer can be lifted from the record. Students then are graded according to material copied.

Timing of semaphore sending in words-per-minute is accomplished by proper spacing of gong signals. Speeds vary from four to ten words per minute as the course progresses. Sound code speeds reach a maximum of twelve words-per-minute. In blinker, the maximum is ten words.

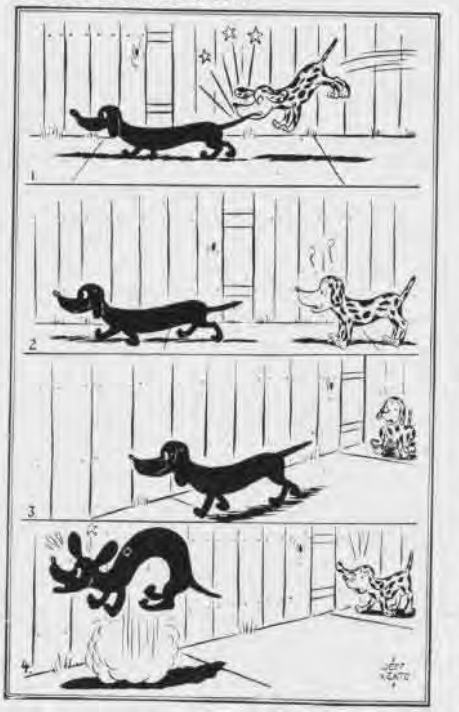
The first recorded course in code, blinker and semaphore consists of 350 lesson units, each eight minutes in length. The turntable speed is 33 r.p.m. This course uses a total of 98 slide films, each numbered to match the particular records requiring them. All records are numbered in sequence. When a record requires an accompanying film, this fact is noted on the record label.

To reduce the number of actual records, both sides of each record are used, thus allowing two lesson units to be made on each. There are 175 records in the first course.

The second recorded course is for code instruction only. One hundred and ninety-two lesson units are used, maintaining speed at 14 words per minute. Turntable speed for these records is 78 r.p.m. They run 4.5 minutes each. These records carry two lesson units. Thus 96 records make up this course. No films are required. Plan of the courses calls for use of four lesson units or two records each day of instruction. Since copy is sometimes in sequence, this utilization is necessary to obtain proper functioning of the course.

Records and films are obtained from the Aviation Training Division.

DELAYED COMMUNICATION



Gunner Gets Flying Lesson by Radio

Communications continually plays a life-or-death role on battle fronts. One dramatic example occurred in February in a raid on Munda. The pilot of an SBD was killed by ack-ack shrapnel, leaving the rear-seat gunner, Marine Sergt. Gilbert H. Henze to get along the best he could.

Untrained as a pilot, Sergt. Henze nevertheless took over the rear seat controls and kept the plane in level flight. By radio, he asked the leader of an escorting flight of fighter planes for instructions.

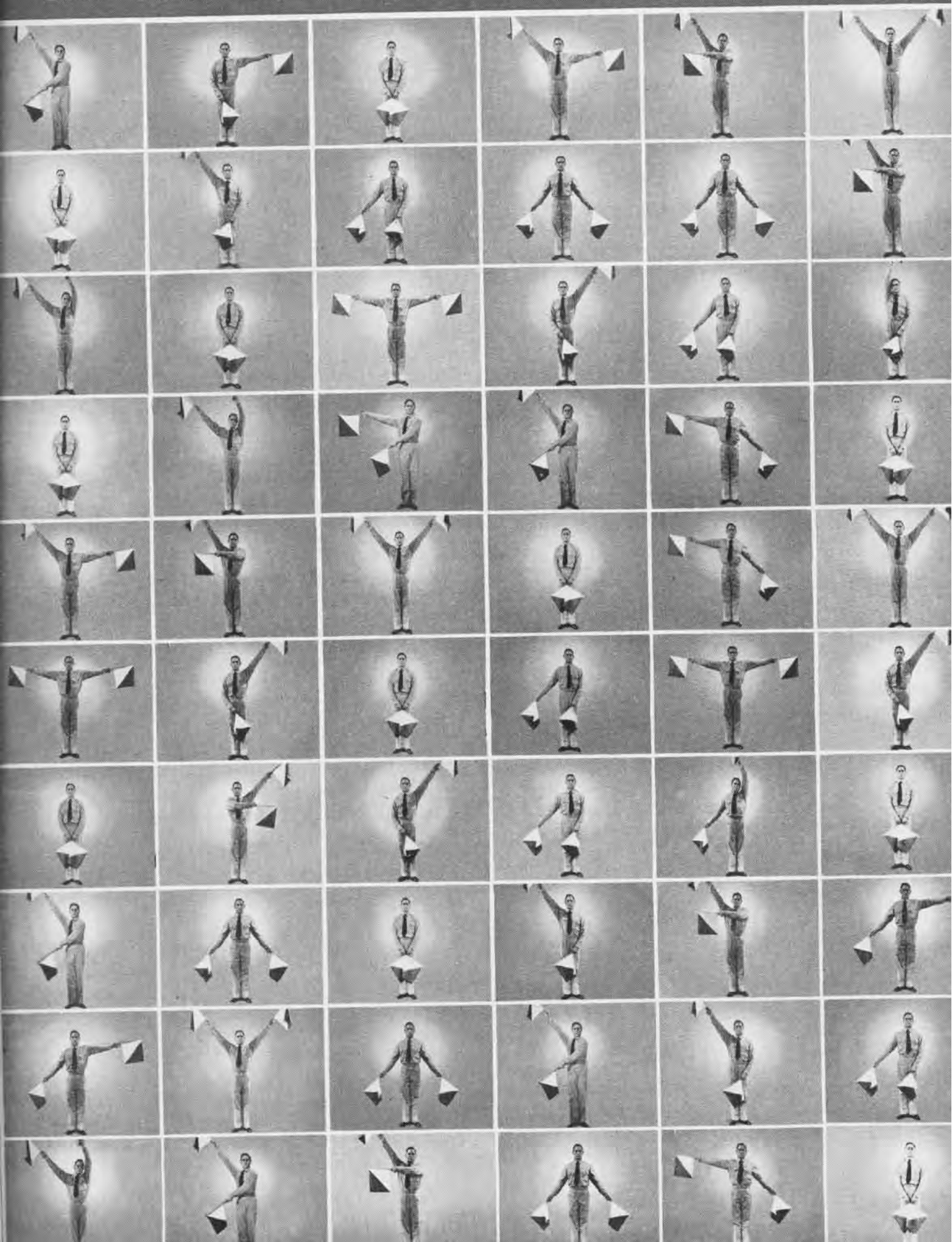
The fighter pilot swung closer and, by radio, gave Henze essential tips on how to keep his plane flying. The sergeant was told follow the "island route" back to Guadalcanal because there was no compass in the rear seat of the *Dauntless*.

The pilot of the fighter flew along with Henze, continuing the radio flying instructions. Near the Russell Islands the sergeant reported that the *Dauntless* was running low on gas. He couldn't open reserve tanks because the switches were in the front cockpit.

At this crucial point the fighter plane's radio went out and the flying instructions were brought to an abrupt stop. Sergt. Henze put the bomber into a dive, unhooked his safety belt and jumped. Before he could dodge the diving ship the stabilizers hit him across the legs. One leg was cut off below the knee.

As he swayed in his parachute fall, Sergt. Henze used his hands to maintain pressure on the leg's main artery to check bleeding. Impact with the water knocked him unconscious. After he regained his senses, he swam for about six hours. The effect of salt water apparently stopped the flow of blood from his severed leg. He was picked up by natives.

CAN YOU READ THIS SEMAPHORE MESSAGE?



WHAT DO YOU KNOW ABOUT . . . PARACHUTES?

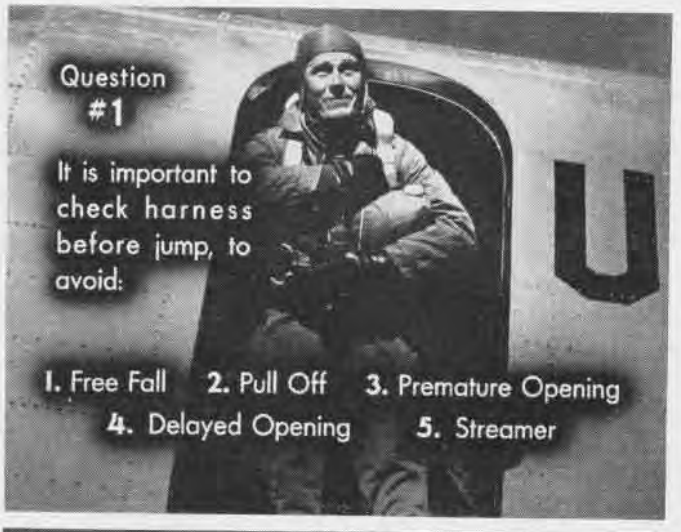
When a parachute saves a man's life, it is customary to put a gold star on the pack. The star is not to praise the parachute but the parachute rigger. It means he has done his job well. Riggers know their chutes. By the way, what do you know about them? Answers on p. 32.

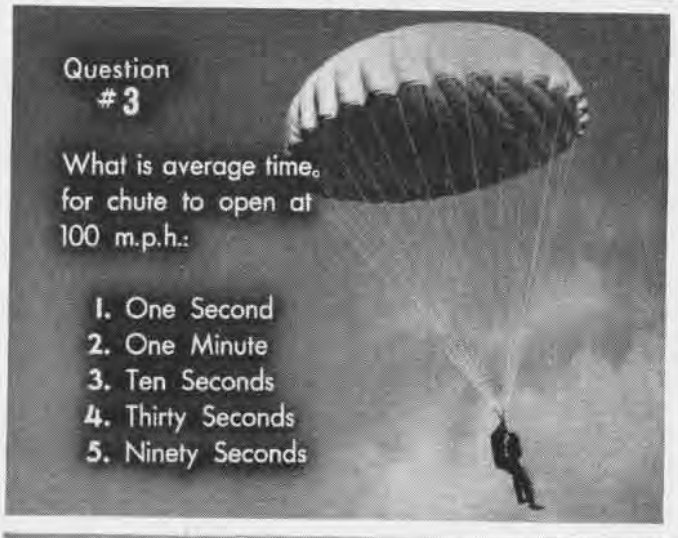
Write your answers here

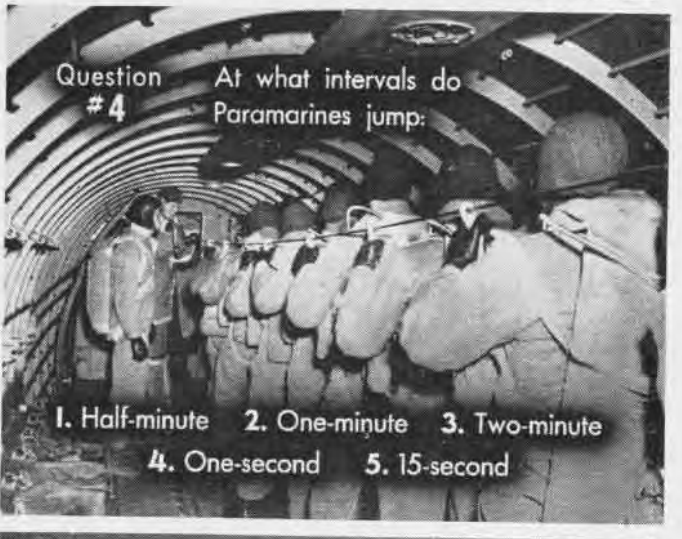
1 _____ 4 _____

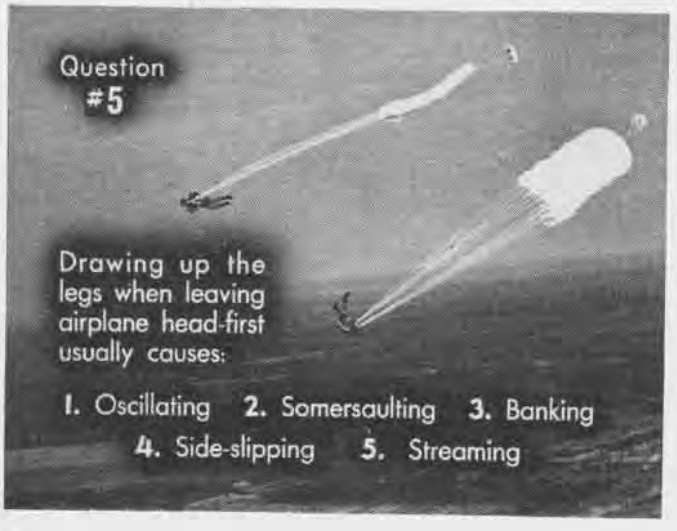
2 _____ 5 _____

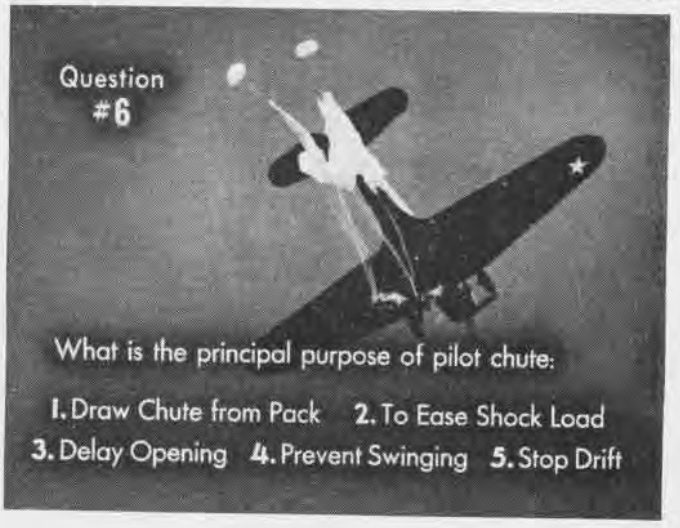
3 _____ 6 _____











TECHNICALLY SPEAKING

Adjust Generator Cut-outs

BuAer Letter Tells Procedure

From time to time various reports have come to BuAer from several activities describing difficulties and failures of reverse current relays, particularly the NAS–1116 type. It should be noted that a very active development program is under way with the objective of finding better types of relays. Meanwhile, much of the trouble with the present relays can be avoided by careful adjustment. BuAer letter, Aer–Ma–1242–Kt, F36–2 (6), Serial No. 171804, dated 3 December 1942, discusses methods of adjusting these cut-outs. Activities experiencing trouble are urged by BuAer to check this letter to be sure they are not overlooking some necessary procedure in maintenance of this equipment.

Device Aids Link Trainer

Determines Position, Heading

A new link trainer device has been developed which helps the instructor to visualize quickly the position and heading of student in relation to a radio range. Perfected at MCAS, El Toro, it consists of a small model airplane mounted on the shaft of the radio compass control of the automatic recorder.

This airplane indicator on the link crab which has been in use for several months at El Toro, is not difficult to build and install.

To replace thumb screw which holds needle indicator on the radio compass control a screw of the same stock is inserted and the small airplane mounted. Since the needle indicator is mounted on the underside of the model airplane, it still gives the same indication as in the original position. Another needle may be placed on the top of the airplane to give an indication from the top and looking down on the automatic recorder.

While any type of small recognition model airplane can be used as the indicator, the model plane used should be small enough to clear the handle in the center of the automatic recorder.

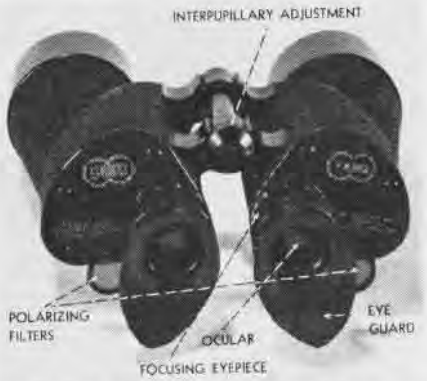
[Designed by Tech Sgt. George E. Thayer, U.S.M.C.]

▶ BuAer COMMENT—This is one of the many helpful devices developed or perfected by enlisted personnel for use in connection with the Link Trainer.

No Shortage of Binoculars

Rules to Obtain Best Usage

A critical shortage of binoculars for use in aircraft has existed for some time. This situation now has been



SUFFICIENT SUPPLY OF BINOCULARS READY

alleviated and a sufficient supply of binoculars is available. The allowance list is as follows:

2 per VPB airplanes
1 per VTB, VOS, VSO, VSB, VR, VJR airplanes
5 per ZNP airships

Squadrons not equipped with binoculars may draw them from stock in accordance with this list.

Binoculars must be handled carefully. External damage and sudden jars may throw the instrument out of collimation, necessitating overhaul. To obtain as clear and wide a field of view as possible and to avoid eyestrain, the following rules should be observed:

1. Set binocular for distance between eye pupils.
2. Focus each eyepiece separately while looking at a distant object, shutting eye at eyepiece not being focused or obscuring the corresponding objective lens.
3. Do not touch lens surfaces. Keep them clean with lens tissue or soft cloth. Do not use liquids.
4. When using polarizing filters to eliminate sun glare, place them with axes vertical.

(It is important to remember settings in 1 and 2 above for future use.)

Old Parts Bewitch Compass

Erratic Readings Cured Simply

NAS, Sanford.—This station recently experienced a wave of erratic readings on the pilot's magnetic compass of SNB–2's, the error sometimes reaching as much as 45° on certain headings.

After considerable search, it was determined that the SNB–2's retained several non-essential equipment items from their commercial days, the principal offender being a gyro-pilot valve actuating rod, handle and hanger of steel. Removal of these parts eliminated the trouble.

Gunnery Tip on OS2U's

Simple Remedy for Grievance

Those who have complained about the small depression angle of the rear-seat gun in OS2U's and N's can remedy the difficulty with ease, Naval Aviation News is informed.

In the *Erection and Maintenance Manual,* drawing CV–54404 for the plane, entitled "Seat Installation, Rear Cockpit, Flexible Gun . . . " bears a note on "Uppermost position of seat, etc." If the stop collar shown on the vertical column support for the seat (stopping seat from going higher) is discarded, it will be found possible to shoot and sight down to about 20° from the vertical.

ENLISTED PERSONNEL LEARNS ALL INS AND OUTS OF ENGINES AT UNIVERSITY OF AIR TECHNICAL TRAINING, EIGHTY-SEVENTH STREET, CHICAGO

THIS IS A SPECIALISTS' WAR

"AS FAR AS technicians are concerned, this is a specialists' war." This remark by a recent graduate of the SBD familiarization course at the Douglas Aircraft Plant in El Segundo sums up the purpose of the specialized training program sponsored by the Naval Air Technical Training Command. At schools in some 20 factories and the NATechTraCen at Eighty-seventh Street, Chicago, enlisted men get advanced courses in line maintenance of various type airplanes, instruments, engines, carburetors, starters, heaters, superchargers, propellers, turrets, and aircraft ordnance equipment. Two schools provide detailed study of photographic equipment. At LaGuardia Field in New York, Pan-American Airways presents an intensive course in big boat operation for flight mechanics. Factory training schools mushroomed during the first year and a half of the war. Recently, however, many of them have literally been packed up and moved to NATechTraCen at Eighty-seventh Street, Chicago. Today the Eighty-seventh Street training center is considered the "university" of air technical training. The pamphlet Prospectus on Specialized Training Program, available from the Chief of Naval Air Technical Training, Chicago, Ill., gives detailed information.

Support for Plotting Board

Position for Pilot Held Ideal

NAS, PENSACOLA.—Flight students no longer need three hands to fly their SNJ4's and navigate at the same time. A new support developed for the plotting board at an NATC Squadron here does the trick.

The support keeps the plotting board from flying out of the cockpit, provides a steady table, is interchangeable so that it can be stowed and not interfere with take-offs or landings, does not obscure instrument panel (where the full-air ratio gage belongs). It also prevents plotting board from cracking or bending.

Plotting board is mounted on a plywood backing and secured with corner mounts in the same manner as a snapshot in a photograph album. A separate metal fitting, approximately 6 inches long, is constructed, which fits into the instrument panel.

The plotting board is mounted on a plywood backing and secured. Board can be attached to the fitting, and is in an ideal position directly in front of pilot. To steady the board, small button-on straps are bolted to each side on the cockpit.

A small canvas stowage envelope is bolted low and to the right of the pilot's seat and holds the plotting board when it is not in use. Each student is ordered to close the hood momentarily while placing the board in position or stowing it, thus preventing possibility of slip stream "surveying" a valuable plotting board.

The fact that squadron students are now going out with a blank plotting board, figuring their wind en route, and making accurate returns from complicated sectors speaks well for this installation.

SPECIALIZED TRAINING CALENDAR

As of October 1, 1943

FAMILIARIZATION

PB4Y—Consolidated-Vultee, San Diego.
PV—Vega, Burbank, California.*
PBJ—North American, Englewood, Calif.
SBD—Douglas, El Segundo, Calif.
SB2C—Curtiss-Wright, Columbus, Ohio.
TBF—Grumman, Bethpage, L. I.*
F6F—Grumman, Bethpage, L. I.*
F4U—Chance-Vought, Stratford, Conn.
FM—G. M. Eastern Aircraft, Linden, N. J.

MAINTENANCE

Auxiliary Power Plants:
Lawrance, NATechTraCen, 87th Street, Chicago.
Carburetors:
Stromberg and Holley, NATechTraCen, 87th Street, Chicago.
Engines:
Pratt & Whitney, Hartford, Conn.*
Wright Aeronautical, Paterson, N. J.
Fairchild Aviation Corp., Farmingdale, L. I.
Heaters:
Selas, Herman-Nelson, Stewart-Warner, NATechTraCen, 87th Street, Chicago.
Instruments:
Sperry Gyroscope, Brooklyn, N. Y.*
Pioneer and Kollsman, NATechTraCen, 87th Street, Chicago.
Magnetos:
Bosch and Scintilla, NATechTraCen, 87th Street, Chicago.
Ordnance Equipment:
SBAE School, Minneapolis-Honeywell Regulator Co., Minneapolis.
Propellers:
Curtiss Electric, Caldwell, N. J.
Hamilton Standard, Pawcatuck, Conn.
NATechTraCen 87th Street, Chicago.
Starters:
Jack & Heintz, Bendix and Breeze.
NATechTraCen, Eighty-seventh Street, Chicago.
Self-Sealing Fuel Cells:
Goodyear Rubber Co., Akron.
Turrets:
Briggs Mfg. Co., Detroit.*
NATechTraCen, Eighty-seventh Street, Chicago.
Turbo-Superchargers:
NATechTraCen, Eighty-seventh Street, Chicago.
Turbo-Supercharger Controls:
Minneapolis-Honeywell Regulator Co., Minneapolis.

INSTRUMENT OVERHAUL

Chicago School of Aircraft Instruments, Chicago.

SPECIAL DEVICES

Special Devices School, NATechTraCen, Navy Pier, Chicago.
Link Celestial Navigation Trainer School, NAS Quonset Point.
Link Celestial Navigation Trainer School, NAS Seattle.

PHOTOGRAPHY

Motion Picture Camera School, NAS, Anacostia.
Fairchild Aviation Corporation, New York City.
Mechanics Institute, Rochester, N. Y.

FLIGHT MECHANICS

Pan American Airways, La Guardia Field, N. Y.

OFFICER TRAINING

Engines:
Mass. Inst. of Technology, Cambridge, Mass.
Pratt & Whitney, Hartford, Conn.
Aeronautical Engineering:
Mass. Inst. of Technology, Cambridge, Mass.
University of Minnesota, Minneapolis.
California Inst. of Technology, Pasadena.
Aerology:
Mass. Inst. of Technology, Cambridge, Mass.
California Inst. of Technology, Pasadena.
University of California, Los Angeles.
University of Chicago, Chicago.

*For officers and enlisted men.

White Prop Tips for Safety

Put on Night-Flying Trainers

NAS, NEW ORLEANS.—The simple expedient of painting the prop tips of training aircraft white has proved itself a major safety factor. All training planes used for night flying at this station now have 9 inches of the propeller tips painted with a white lacquer. This experiment was authorized by CNAPrimTra.

Tests prove that the white lacquer makes the prop's arc just as visible in daylight as the standard tip painting arrangement, which is undesirable at night.

[DEVELOPED BY HARM RAMEY, ACMM]

ANSWERS TO AIR PLOTTING PROBLEM

1. Wind	From 230° Force 25 k	
2. 0730 no wind (air) position	Lat. 15°–51′ S	Long. 179°–47′ E
3. 0730 dead reckoning position	Lat. 15°–35′ S	Long. 179°–54′ W
4. 0936 no wind (air) position	Lat. 13°–15′ S	Long. 179°–55′ E
5. Average wind	From 260° Force 20 k	
6. Magnetic heading	119°	
7. Estimated time of interception	1046	
8. Bearing 326.5°	Distance 50 miles	

NOTE: Tolerances of two or three miles or two or three degrees from the answers are considered correct.

(See page 13)

BOARD TEACHES NAMES OF TOOLS

A New Device That Simplifies Mastery of Names of Parts and Gadgets is Placed at The Disposal of Navy Pier's Technicians

NAVY PIER, CHICAGO.—The gunnery department at this technical training center has constructed a device in the form of a board for instruction of trainees attending Class A schools. Nomenclature, always the nightmare of students, is made relatively simple, and the student suddenly discovers he not only knows the name of a part, but what it looks like also.

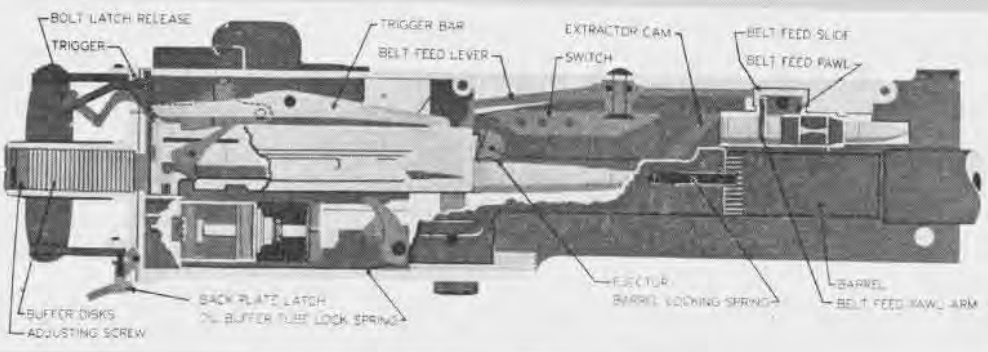
The device has a place for each part or group plainly labeled so that in the process of assembly and disassembly the student always associates the correct name with each part or group removed from the gun in stripping. The board illustrated was designed for the .50 caliber M2 Browning machine gun. Similar boards can be adapted to needs of other weapons by a rearrangement of compartments and use of new labels.

HE MUST KNOW HIS WEAPON

Another advantage of the compartment board is that it accustoms the trainee to be systematic in arrangement of parts in groups according to disassembly, thereby speeding up time required to put the gun together again. The habit of small parts to roll off the bench is corrected; each compartment has a protecting edge.

In fact, the device might be termed the perfect training aid in that it is cheap to construct, made of noncritical material, popular with both student and instructor, adaptable to other needs, and an occasional dusting is only maintenance requirement.

←ASSOCIATION OF NAMES AND PARTS BECOMES AUTOMATIC; LOSS OF SMALL PIECES IS CHECKED THROUGH USE OF CLASSIFICATION BOARD



WITH UNITS ASSEMBLED, STUDENTS LEARN TO SEE THE WEAPON AS AN AGGREGATE WITH SEPARATE PARTS IN PRECISE AND RELATIVE POSITIONS

Someday Wilson's Gonna Drop One Of Those"

Cut PBY Navigation Table?

Change Thought Undesirable

PATROL SQUADRON 42, PACIFIC.—From this squadron comes the suggestion that the navigation table in the PBY be cut to half its present size. The drift sight could then be moved up to the edge of the navigation table, leaving plenty of space for navigation and relieving the usual crowded condition of the compartment. An excellent stowage space for seldom-used plane equipment could be built into this part of the plane, or make it available as passenger or freight space.

▶ **BuAER COMMENT—The proposed change in table size is considered undesirable for the following reasons: 1. A reduced table would not accommodate the new and larger charts which are expected soon to be put into service. 2. A reduced table would necessitate relocating the astrograph mounting provisions as well as the drift sight.**

The only evident advantage is increased passenger and baggage space, but even this advantage is in doubt when it is considered that the space under the existing table is already available for additional storage.

BEST ANSWERS
To questions on page 11
1. d 2. a 3. e 4. e 5. c 6. c

ANSWERS TO PARACHUTE QUIZ
on page 26
1.2 2.5 3.1 4.4 5.2 6.1
Visual quizzer films are available from BuAer's Special Devices Division, standard slide film versions from Training Films.

LETTERS

SIRS:

We would like to be informed as to whether or not certain cuts which appear in the August 15, 1943, issue of NAVAL AVIATION NEWS could be obtained for use in the cadet newspaper at this base.

OFFICER IN CHARGE
U. S. Naval Flight Preparatory School
Northfield, Minn.

¶ Unfortunately it is not practicable to furnish either cuts or prints of illustrations appearing in various issues.

SIRS:

Technical Note No. 10-43 on Exhaust Flame Dampers has a statement which is being questioned by pilots of Air Group 3. This statement—paragraph 4 of the TN—implies that operation in *rich mixture* reduces exhaust flame visibility.

We have found in practice with carrier type planes that the exhaust flame visibility is reduced by operating in a lean mixture setting.

Perhaps the apparent diversity of thought on this subject is occasioned by the definition of *lean mixture* and *rich mixture* and *exhaust flame visibility distance*. By lean mixture we mean the automatic cruising lean setting on the mixture control quadrant which has been predetermined by the makers of the carburetors, and by rich mixture we mean full manual rich—forward position on mixture control quadrant.

COMMANDER, AIR GROUP 3

¶ Paragraph 4 of TN10-43 may be misleading insofar as the flame visibility characteristics are concerned with no flame dampers installed. However, when flame dampers are installed or in cases where the airplane has individual stacks, as in F6F-3, the exhaust flame visibility is tremendously reduced by operation in *auto rich*. This has been demonstrated by numerous flame damping flight tests. It is also believed that *full manual rich* might result in extreme flaming.

SIRS:

NAVAL AVIATION NEWS, August 15, 1943, published on page 19 an interesting and instructive set of multiple answer problems under the title "IV—Essentials of Naval Service."

Since, however, NAVAL AVIATION NEWS has often served effectively in this squadron to further indoctrinate personnel in Navy customs and traditions, it was somewhat disturbing to note your answer to problem No. 4, namely, "The commanding officer of a battleship must govern his ship under a system of absolute *despotism*."

Old Mr. Webster, even in his most abridged publications, invariably associates "tyranny" with despotism. In his unabridged editions, he goes to town in emphasizing the synonymity.

Does NAVAL AVIATION NEWS advocate a procession of Captain Blighs for our modern BB's? Surely, in our enlightened generation, hellbent on removing all traces of tyranny from this most unhappy world, some designation of "absolute rule" must more aptly serve than "despotism."

COMMANDING OFFICER
Scouting Squadron 39

¶ According to both the "Century Unabridged" and "Funk & Wagnall's Standard" dictionaries, the first meaning of despotism is the "exercise of absolute authority." It was no doubt in this sense that John Paul Jones meant it when he said, in his famous letter of September 14, 1775, to the Naval Committee of Congress (which appears in the introduction to *Naval Leadership*) that "the ships themselves must be ruled and commanded at sea under a system of absolute despotism." That John Paul Jones did not imply a Captain Bligh type is evident from many statements made elsewhere, such as: "In one word, every Commander should keep constantly before him the great truth, that to be well obeyed he must be perfectly esteemed."

The semantic difficulties arising from the use of the word "despotism" should, perhaps, have been avoided by using quotes and stating the question: "In the words of John Paul Jones, . . ."

SIRS:

The article relative to income taxes in the September 1 NAVAL AVIATION NEWS is splendid, and will no doubt be of a real service to a great many people. In fact, the whole magazine appears to be very well constructed, and I read it with a great deal of interest.

COMMANDANT
U. S. Navy Yard
Washington, D. C.

SIRS:

It is requested that the Naval Mission be placed on the mailing list for one additional copy of NAVAL AVIATION NEWS for use of Brazilian personnel.

CHIEF, U. S. NAVAL MISSION TO BRAZIL
Rio de Janeiro, Brazil.

NAVAL AVIATION

NEWS

Paramarines at New River

Marine Corps Aviation
Recorded Communications
Technically Speaking

Oct. 1, 1943
RESTRICTED

Degree of Flap Opening

BuAer Summarizes Take-off Tests

AIR GROUP 3.—There is a diversity of opinion among SBD pilots as to the degree of flap opening that allows safest and shortest carrier take-off. The SBD–3 handbook states that flap openings up to 15 degrees may be used on carrier take-offs, whereas the SBD–5 handbook says full flap should be used.

One bombing squadron of this group, VB–3, has found a flap setting of one-third to two-thirds full flap gives the best apparent take-off characteristics of quick take-off, rapid acceleration, and positive control with all values of loading conditions.

It is felt that this problem is unique to the SBD since it is overloaded and underpowered. Perhaps the Bureau could indicate if there is a setting of the flap which would cause a reduction in the L/D ratio. Would it be reasonable to say that the full flap setting is not the best for SBD's due to the reduction of control and low airspeed when first air-borne? Also, what difference in take-off run would be expected from two-thirds flap to full flap at 30 knots of wind?

Loading condition	1000-lb. bomber	Scout	1600-lb. bomber
Gross weight	9,455	8,760	10,049
Full flap:			
True indicated take-off speed (miles per hour)	72.5	69.5	81
Take-off distance, calm (feet)	780	730	1,015
Take-off distance, 25-k wind (feet)	310	275	450
Two-third flap:			
True indicated take-off speed (miles per hour)	.76	72.5	83.7
Take-off distance, calm (feet)	860	770	1,090
Take-off distance, 25-k wind (feet)	355	305	500

▶ *BuAer COMMENT*—Results of take-off tests conducted at NAS Anacostia on the SBD–5 are summarized in the accompanying table. Following technique was used in these tests:

a. Flap was set and take-off power was applied with the airplane held by brakes.

b. During the run, tail was raised well up by moderate force on controls.

c. Shortly before take-off speed was reached, tail was pulled down to maximum possible ground angle.

T. O. 27–42 presents results of take-off tests conducted on the SBD–3 under overload conditions. Full flap was used in these tests, but it was found advisable to use rated take-off power until complete retraction of landing gear and flaps is effected. Landing gear should be retracted immediately after take-off in order to reduce drag and increase air speed prior to retracting flaps.

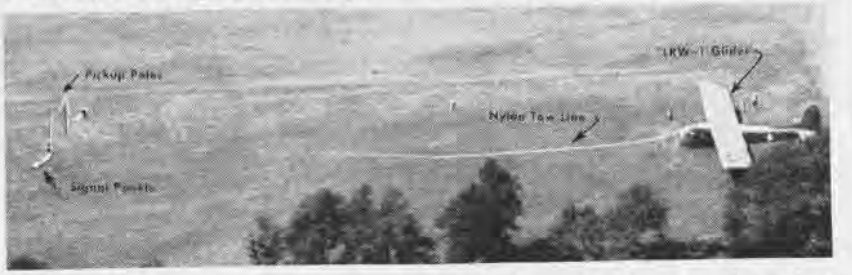
Safe altitude should be attained before beginning to retract flaps, which should then be done in steps to avoid a sharp reduction in lift at reduced air speeds. Caution is necessary to insure that proper retracting control is operated and that flaps are retracted in increments.

For best results, flap setting for take-off must be modified in accordance with experience and judgment based on operating conditions, such as conditions of field, load carried, etc. Maximum rate of climb is not obtained with the flap setting that gives shortest take-off run from the carrier or ground.

Maximum L/D ratio and best rate of climb after take-off are obtained with flap fully retracted. Use of full flap for take-off from areas with obstructions in the near vicinity should be avoided because of low rate of climb and difficulty of gaining altitude during period of retracting flaps. Shortest total distance for taking off and clearing an obstacle would probably be realized with use of partial flap deflection.

Effect of slots and flaps in take-off and landing is discussed in T. N. 42–36.

Snatch Pickup Gear Experimental Model Now on Way



NAF, PHILADELPHIA.—A system offering tremendous possibilities for pick-up of gliders from small fields was employed recently by Project George personnel after a broken towline forced the landing of Army Air Forces LRW–1 glider, assigned to Naval Aircraft Factory, in a limited field near Lilly, Pa. The glider suffered minor damage to starboard wing when the tow rope snapped back.

Repairs to wing were made in field by Project George, but size of field prevented towing the glider out by conventional means. Nearest suitable location for landing tug was the CAA emergency field at Martinsburg (Cove Valley), Pa.

Glider Snatched From Field

From Army Air Forces it was learned that a C–47 (R4D–1) with an All American Aviation snatch pick-up gear was available at Wilmington, Del. Arrangements were quickly completed and ground equipment was flown to Cove Valley, then by auto to the glider. The pick-up plane, after surveying the situation from the air, made one pass through the ground station, snatched the glider from the field, and delivered it to Cove Valley without incident. Take-off run was approximately 150 feet, acceleration 0.9 G.

It is understood that an experimental snatch pick-up winch is being procured by BuAer for tests by Project George. Since this winch has not been proven by actual tests, and since it will be necessary to develop technique and equipment for operation, the recommendation has been offered that the Bureau obtain a 12,000-lb. pick-up unit, now being manufactured in quantity for Army Air Forces by All American Aviation, so that a background of experience can be built up before winch is delivered.

▶ *BuAeR COMMENT*—The Bureau concurs with recommendations. Army's units are now operating daily, doing routine work. AAF has 250 units on order and will allocate one for Navy use. All American Aviation will be asked to make installation. However, the winch being built experimentally for the Navy, uses hydraulic braking action instead of friction and promises to be superior to the AAF unit.

The Gunairstructor, fixed gunnery device that closely simulates combat aiming conditions, is in use at naval air stations

ALNAV 164

CHANGE IN NATIONAL INSIGNIA

The color Red has been removed from the national insignia for all U. S. aircraft. Insignia Blue takes its place, as shown in the reproduction above. Red had previously been incorporated in the design in order to complete the national colors. Its removal now is based upon the objection of aviators in the South Pacific to the use of Red because of possible confusion with the Japanese rising sun insignia, which is Red.

NATIONAL MARKING JAPANESE AIRCRAFT