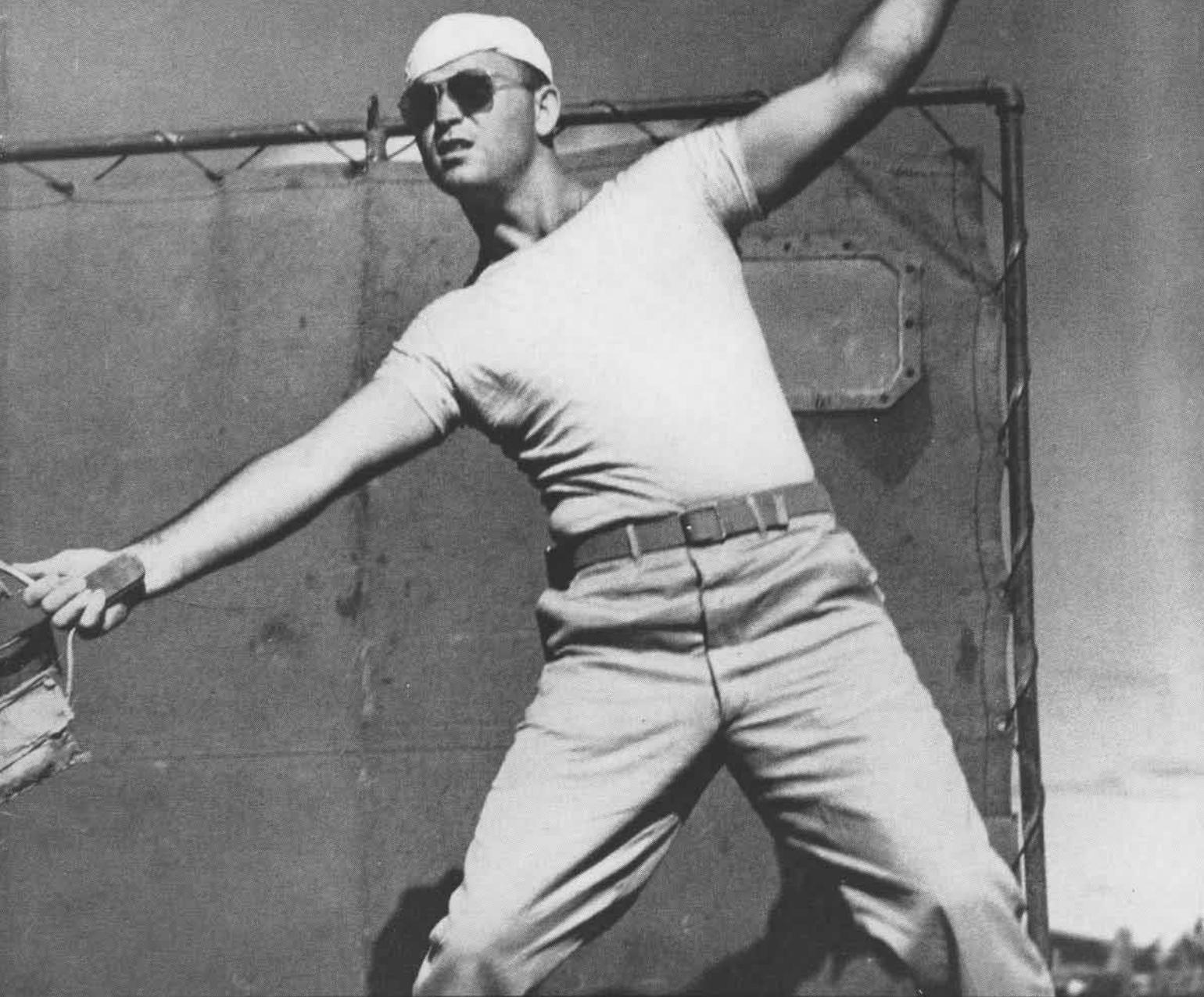


NAVAL AVIATION

# NEWS



Tarawa Fortifications  
Danger Lurks in Clouds  
Action in South Pacific

Feb. 1, 1944  
RESTRICTED



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# SHORT TITLES

**A**BBREVIATIONS and short titles—curious designations like ComFair Wing, JAG, and AINav—have become so important to the business of running a war that the Navy plans to catalog them to standardize their usage.

The need of such a catalog is evident. For instance, it should end the argument over the designation of Chief of Naval Air Primary Training. Votaries of the two schools of thought—those preferring CNAPT and those in favor of CNAPrimTra—will be asked to accept a standardized designation.

New short titles spring up regularly. Many abbreviated names are born through the need for telescoped language in dispatches. Naval Communications has become the hatching place—and to some extent the official review body—in the realm of title briefing.

Service personnel are quick to learn that they must know scores of abbreviations, short titles, and semi-

official slang if they are to talk the language of the Navy. The Marines' South Pacific Combat Air Transport Command is known as SCAT; Commander Aircraft South Pacific Force has become ComAirSoPac; HedRon means Headquarters Squadron; while Commander Air Transport Squadron is condensed to ComAirTransRon.

**T**HE SHORT-TITLE VOCABULARY of any given Navy man is sure to reflect the nature of his particular task. Persons attached to the aeronautic organization are familiar with the designations common to that branch—ComPatWingsLant, BuAer, CV, ETA, TN, NATS, LTA, RUDM, and so on. But they may not know that AH is a hospital ship, that ChC means Chaplain Corps, or that SportFor is short for Support Force.

NANews presents an incomplete list of some of the newer aeronautical designations on the following pages.

# NAVY LANGUAGE IS SPRINKLED WITH A WIDE AND VARIED ASSORTMENT OF BRIEF TITLES



► **ACORN.** An Acorn is an airfield assembly unit designed to accomplish rapid construction and operation of a landplane and seaplane advanced base, or, in conjunction with amphibious operations, quick repair and operation of a captured enemy airfield.

Each airfield assembly consists of two 6,000-ft. runway strips of pierced plank landing mat together with necessary airfield or seadrome construction equipment. Each Acorn is so equipped that when furnished with a CASU and a PATSU it can service, rearm, and perform minor repairs and routine upkeep for the planes of one carrier group, or its equivalent, and one patrol plane squadron.

An Acorn without CASU or PATSU includes sufficient personnel to maintain the aviation facilities in operating condition, to provide for servicing casual planes, to operate the air warning system, field lighting, transportation and medical facilities and to maintain berthing and messing facilities to be used by the CASU and/or PATSU and aircraft crews.

► **ACU.** The job of Aircraft Commissioning Units (formerly Aircraft Delivery Units) is to prepare new aircraft for service and get them ready for ferrying to ultimate destinations. The four ACU's receive planes from manufacturers; install confidential and secret equipment; make tests and adjustments, and deliver the planes to ferrying squadrons. The ACU's are located at NAS, New York;



NAS, San Pedro; Port Columbus, Ohio, and Trenton, N. J. At Litchfield Park, Ariz., a new facility is being established to operate as an auxiliary to ACU activities at NAS, San Pedro.

► **ASA.** Aviation Supply Annexes are distributing points for aeronautical material located at Norfolk, Va., and Oakland, Calif., supported by Naval Aviation Supply Depots at Philadelphia; Mechanicsburg, Pa., and Clearfield, Utah. The ASA's furnish material to 18 naval air stations designated as major supply points which serve other air stations, air auxiliaries, air facilities and the naval air centers.

► **ASO.** The master control station for the procurement and distribution of aeronautical material is the Aviation Supply Office. Located in the recently completed Naval Aviation Supply Depot at Philadelphia, ASO works closely with BuAer in furnishing the wherewithal to keep in operation the planes, engines, propellers, and accessories purchased by BuAer.



► **ASU.** It is the function of the Aircraft Scheduling Unit to determine allotments and to fix schedules for the over-all requirements of materials, components, and machine tools for both Army Air Forces and BuAer. This includes handling critical shortages and expediting deliveries of aircraft materials, components, and machine tools. If, in the course of dealing with these problems, matters arise involving engineering, inspection, financing, costs, management, and capacity to produce, they are referred by ASU to BuAer



or Matériel Command, AAF. Operated jointly by the Army and Navy, ASU is located at Wright Field, Dayton, with Army, Navy, and British representatives.

► **BAGR.** Bureau of Aeronautics General Representatives (formerly GINA's—General Inspectors of Naval Aircraft) have cognizance over clerical, engineering, and inspection duties in general inspection districts. The four general inspection districts are: Eastern, headquartered at New York; Central at Dayton; Western at Los Angeles, and Canadian at Montreal.

► **BAR.** Bureau of Aeronautics Representatives (formerly INA's—Inspectors of Naval Aircraft) are usually assigned to particular manufacturing plants with cognizance over clerical, engineering, and inspection duties, maintaining technical control over inspection work. BAR's are not assigned to general inspection districts, but they are required to report to BAGR's for their respective districts.

► **BARR.** Bureau of Aeronautics Resident Representatives (formerly RINA's—Resident Inspectors of Naval Aircraft) have cognizance over clerical, engineering, and inspection duties, serving under BAR's at

particular manufacturing plants. Example: BAR at headquarters of Eastern Aircraft Linden Division, General Motors Corp., Linden, N. J., has authority over BARR's at other divisions of the company at Bloomfield, N. J.; Baltimore; Trenton, N. J., and Tarrytown, N. Y.

► **BLIMPRON.** The number of lighter-than-air craft in a Blimp Squadron varies, depending on the mission. Missions include patrol, rescue, forming and routing of convoys, day and night escort, photography.

► **CASU.** Carrier Aircraft Service Units are shore-based air group service outfits whose function is to support the flight operations of an air group, together with the operation of all facilities, servicing, rearming, minor repairs, and routine upkeep and administrative duties. A CASU has no equipment but depends on the facilities of an Acorn. The effect of CASU operation has been to streamline aviation squadrons so that all major duties of maintenance are handled by specialized crews ashore.

Formerly a squadron carried its own mechanics, ordnancemen, and executive



organization wherever it was assigned. Now a fighter squadron consists only of its pilots; scouting, bombing, and torpedo squadrons carry only their actual flight crews, who will be available, if necessary, to make minor repairs. Thus an aircraft squadron becomes a tight, mobile unit, able to be shifted from carrier to carrier as the exigencies of war dictate.

► **CQTU.** The Carrier Qualification Training Unit represents a phase of naval air operational training. Carrier qualification instruction is provided at NAS, Glenview, for pilots headed for combat duty aboard carriers. Having completed training at one of the Florida operational bases, carrier-pilots-to-be move to Glenview for an intensive week of deck landings and take-offs, over-water formation flights, and catapult launchings, after which they are designated CV graduates. CQTU operates two inland training carriers, the *Sable* and *Wolverine*, on Great Lakes.

► **CUB.** A Cub is an assembly of equipment and trained personnel used as a whole or in part to establish an advanced fuel and supply base capable of furnishing support without repairs for a small task



group of light forces. It also contains harbor defense, harbor control, and operational facilities. Aviation facilities, and CB's necessary to construct a Cub unit

with aviation facilities, are furnished when required. Normally the aviation facilities consist of two Acorns and such other components necessary to perform its mission. Normally two CB's are required.

► **FAWHedRon.** Fleet Air Wing Headquarters Squadron includes all enlisted personnel of a patrol wing who are not part of the combat flight crews, together with all officers not members of the wing staff or the combat flight crews. A FAWHedRon may include certain officers of the wing staff who are performing additional duties in the headquarters squadron. It contains personnel and equipment adequate to support the flight operations of the aircraft attached to the operational command of the wing, including the operation of the facilities provided, line maintenance, servicing, rearming, minor repair and routine upkeep, and to perform all necessary administrative duties.

► **LION.** A Lion is a self-sustaining advanced base unit including the components of a major all-purpose base. It contains technical shops and personnel to perform voy-



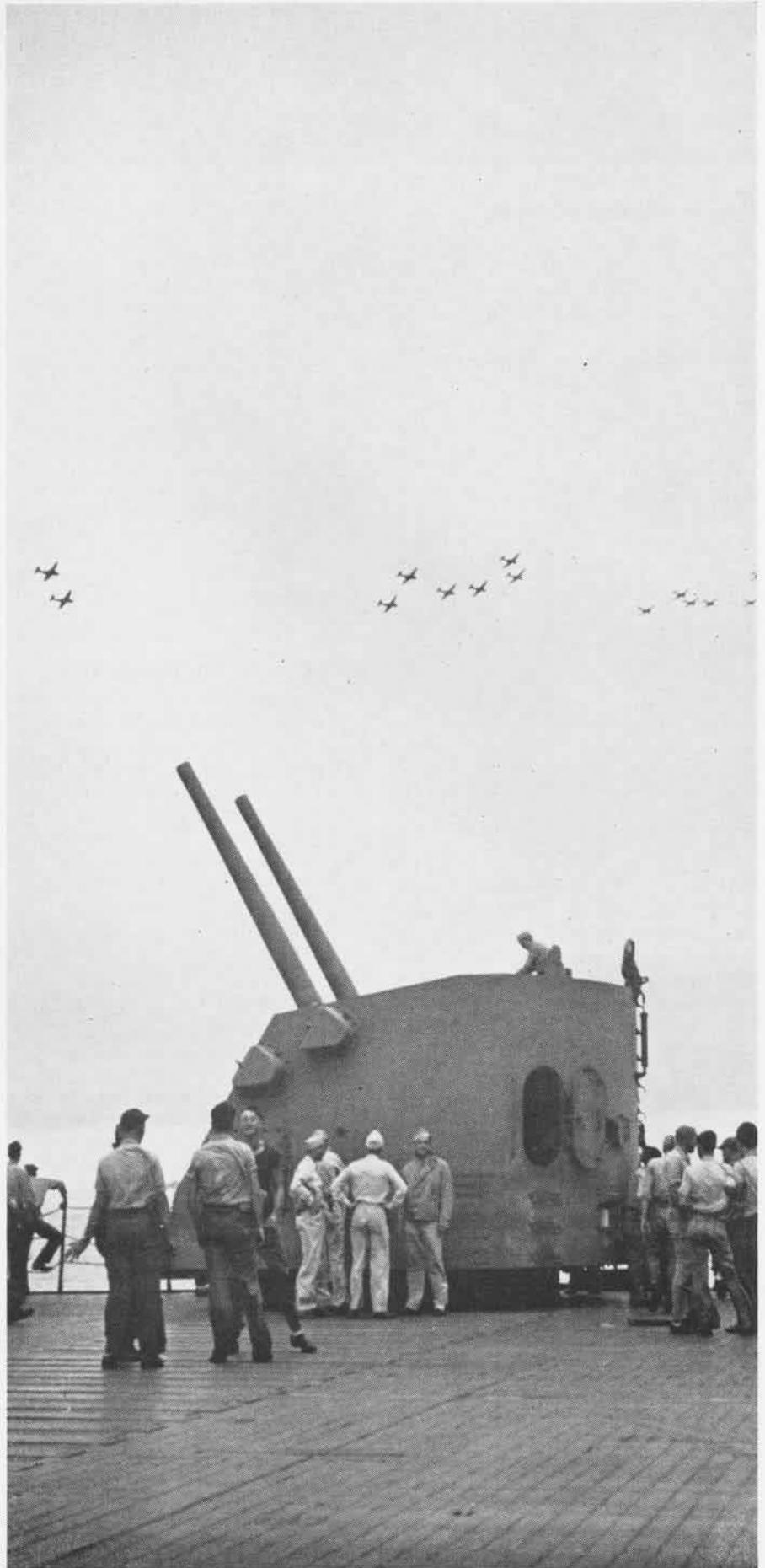
age repairs and to repair minor battle damage for a major portion of the fleet. It includes repair facilities equivalent to a fleet repair ship, plus all special equipment usually provided by a submarine tender and a destroyer tender.

Aviation facilities and CB's are furnished with each Lion unit when required. Normally aviation facilities consist of four Acorns, an engine overhaul component, and such other components necessary to perform its mission. Usually five CB's are required to construct and maintain roads, housing for personnel, technical buildings, water, lighting and communication systems, and other utilities and public works necessary to set up and operate the base.



► **NASD.** A Naval Aviation Supply Depot is a bulk storage area housing aeronautical material under the cognizance of ASO. In addition to the NASD in Philadelphia, ASO controls bulk storage areas reserved for aeronautical material in the Naval Supply Depots at Mechanicsburg, Penna., and Clearfield, Utah.

► **PATSU.** A Patrol Aircraft Service Unit is a detachment of the Fleet Air Wing Headquarters Squadron which performs the functions of that squadron for a detached part of the naval aviation air wing.



CARRIER AND PLANES PROTECT ADVANCED BASE WHILE ACORN AND CUB UNITS SET UP FOR BUSINESS

# GRAMPAW PETTIBONE

## Now I've Seen Everything

The pilot of a TBF taxied out to the designated runway, but before he could start his take-off he was notified by the tower that the runway was being changed due to a wind shift. Before he could reach the other runway, the tower changed the course back to the one first in use.

From the pilot's statement: "By this time my one idea was to get off the field before the tower changed the runway again and as there were still several planes in the air waiting to land, I was in such haste to take off that I forgot to spread my wings. I had no radio-man or gunner with me. While making the run down the runway the only indication I had that the wings were not spread was the fact that the plane would not take off. By the time I was convinced that I could not get off it was too late to stop on the runway."



*Grampaw Pettibone says:*

You should have seen the airplane after it hit the ditch at the end of the runway!

## Instructor's Work Is Never Done

Primary instructors should never take the attitude that they need no longer check their students as to the security of their safety belts. Question them before take-off and once in a while in the air, especially before any kind of violent maneuvers. Make them so safety-belt-conscious that they will frequently check their own belts.

A recent fatal accident again emphasized this point. An instructor gave his student a low altitude simulated emergency during a climb. As a result of the subsequent abrupt forward movement of the control stick, the student was catapulted from the cockpit and killed. The safety belt either became unfastened in flight or had not been secured properly before take-off.



## A Lesson for the Instructor

Upon being given a simulated emergency by his instructor at an outlying field, a student in an SNV-1 shifted the fuel selector valve to what he thought was a full tank. The instructor failed to check the new valve setting. While at a low altitude, the engine cut out, necessitating a forced landing. The airplane was completely wrecked, but fortunately, neither the instructor nor the student was injured.

It developed that the student, instead of shifting to a full tank, had turned the selector to the "off" position.



*Grampaw Pettibone says:*

It is interesting to note that both during and after the landing the instructor swore—he swore he would never again be so trusting as not to check everything his student did.

## Jammed Controls

The ailerons of an SBD-5 jammed on take-off, causing a serious crash. Investigation revealed that the rear seat control stick was loose in the rear cockpit and had lodged between the aileron center control horn and the transmitter shelf leg, locking the ailerons.

It developed that two days previous to the crash this airplane had been engaged in a simulated attack on shore establishments and had carried another pilot as observer. Prior to take-off, the observer was instructed in stowage and use of the removable stick. Soon after that flight it was noted that the stick was missing and it was assumed, after some search, that it had been either lost

overboard while in a dive or had been removed and placed in another plane.

The Trouble Board recommended that plane captains use greater care in inspection for loose articles.

## Fatalist

This is the sad story of an F4U pilot who found a hole in the overcast and climbed up through (against direct orders). Came time to go home, there was no hole. Even though he was in mountainous country, he started an instrument letdown.

Unfortunately, while the pilot could see some of the peaks which stuck up through the overcast, neither he nor his instruments could see the peak he hit which only stuck up into the overcast.



*Grampaw Pettibone says:*

It is my theory that most fatalists are lazy. They like to say, "Well, if it's my turn, I'm going to get it anyway." It takes much less work and effort to assume this attitude and let it go at that than it does to pitch in and learn everything about flying and to prepare for all eventualities. And this is probably also the reason so many fatalists show poor judgment. They are too lazy to get fully qualified in the



science of their profession and are, therefore, prone to "trust to luck."

Flying is dangerous, but it is many times more dangerous for these fatalists than for anyone else. Aviation is a science, based on the laws of cause and effect. You can't get by on guesswork. You have got to know the right answer. Those who don't are eventually screened out.

## Prolonged Inverted Flight

On his first familiarization flight in an F4F-4, a pilot entered a slow roll and delayed his recovery to such an extent that the oil pressure dropped sufficiently to allow the bearings to become dry. The subsequent power plant failure while on the downwind leg of a landing approach made an emergency landing necessary in rough terrain. As a result, the pilot received severe injuries and the aircraft required considerable overhaul.

**COMMENT**—Navy aircraft engines are not made to withstand prolonged inverted flight. The Bureau of Aeronautics manual provides that, "Recovery from inverted flight will be made before the oil pressure drops below 25 pounds per square inch." If inverted flight is prolonged to a point where the oil pressure drops below 25 pounds the engine cannot be properly lubricated and a power plant failure may be expected. Perhaps the failure will not occur immediately. The engine may operate normally for as long as several flights and then fail just when it is most needed. Even if inverted flight is permitted in certain aircraft, inverted maneuvers should never be prolonged.

Your engine is your best friend. Treat it considerably.

## Torque Accidents

An F4U-1 pilot made a hard landing and bounced approximately 50 feet in the air. At the top of the bounce the pilot applied full throttle. The plane immediately did a half-roll to the left and hit on its back.

During a slow landing approach in an SBD-5, the left wing started to drop. When the pilot found he couldn't raise the wing, he used full throttle in an effort to regain control. This airplane also flipped to the left and crashed on its back.

 *Grampaw Pettibone says:*

This is the same old torque problem, gentlemen. In case you have forgotten, propeller torque is the turning moment produced by the rotation of the prop. It always acts opposite to the direction of rotation, therefore always pulls the plane to the left. In high-power airplanes there is a marked tendency for the plane to roll to the left.

Believe me, your ailerons do not get enough air pressure on them at low speed to counteract the tremendous left torque which is generated when full throttle is suddenly applied to a high-power engine. Convince yourself of this by trying it at safe altitude. While still up there, check just how much torque (sudden throttle) you can handle with your ailerons at low speed.

What can be done to prevent this type of accident?

**FIRST:** Don't let that left wing get down when near stalling speed. I admit this is rather gratuitous advice, but it seems necessary—stalls and spins continue to be among the most costly of all aviation accidents.

**SECOND:** When near a stall in a high-powered plane, do not apply throttle suddenly; instead, *anticipate* the stall and apply throttle gradually. If you haven't time to ease it on gradually, better not use any. Do the best you can with what you have and accept a hard landing or a minor accident, if necessary, rather than a possible fatal crash, such as the two listed above.

Remember, speed control is the quintessence (yes, *quintessence*) of airmanship. If you can't control your airspeed you'd better go back to flying small balsa models.

## Blimp Your Motor

An N2S-3 student (58 hours) throttled back his motor and glided down from 3,000 feet. When he again applied throttle at 500 feet, the motor was so loaded up that it sputtered and then cut out entirely. The only space available for an emergency landing was a short field with rough surrounding terrain. The plane ran through three fences after landing, hit a small tree and then dropped on its nose over a small embankment.



*Grampaw Pettibone says:*

Certainly this pilot must have heard about blimping his motor to keep it from fouling up during a long glide!

Aircraft safety warnings are not issued for fun, nor are they to be taken lightly. They contain the meat of a lot of flight experience and are issued specifically to keep you out of the same trouble that others have already had. Pilots who disregard warnings aren't always as lucky as this student was. He got a second chance.

## Physical Fitness

Pensacola reports that for the second time within six weeks an aviation cadet, forced to parachute over the Gulf, has returned to continue training, thanks mainly to excellent physical condition.

In the most recent case, the cadet bailed out late one afternoon and was picked up 24 hours later.

The parachute jump, from 1,700 feet, was normal. The Mae West inflated satisfactorily. A companion in another plane reported his approximate location, but darkness delayed rescue.

Early the next morning the cadet saw planes circling in the distance. He released his dye marker to attract attention, but due to the whitecaps he was not seen. Diligent search was continued, however, and late that afternoon the cadet finally was spotted by one of the OS2U-2 search planes. This plane dropped the student a life raft and circled until he was rescued by a patrol plane.

The cadet said he was tired and thirsty after his 24-hour float. He had



been stung by sea nettles and one foot was slightly lacerated when a fish either bit or finned him. He saw no sharks. This cadet hasn't been heard to grumble recently about required physical drills.

## "Drive Your Own"

"The accident campaign posters, 'Don't drive the car of the fellow ahead; drive your own,' might well be headed by our pilots," according to Marine Base Defense Aircraft Group 43.

"On a recent gunnery training flight two F4U's were involved in a mid-air collision. No. 1 pilot, whose turn it was to attack, was flying his plane into a better position for his run. He had eyes for nothing but the target plane. The No. 2 pilot, in line to make the next pass, saw that he was in a good position and thought pilot No. 1 was going to cross under and let him go first. No. 1's propeller chewed the tail section off No. 2's. Bailing out when his plane was in an inverted spin, No. 2 parachuted to safety from 20,000 feet. No. 1 made a dead stick landing."



THIS IS WHAT HAPPENED when the No. 3 man got sucked in on a formation take-off, lost control in the leader's slipstream and collided with the leader's tail. Page Tojo!

## Heads Up

Upon leaving Trenton, N. J., an inexperienced ferry pilot, flying a TBM, inadvertently joined up with the wrong formation. It so happened that the group with which he joined had the same destination, but was taking a route different from that for which this pilot had maps. Upon discovering his mistake some time later, he elected to stick with the flight. After flying for 1 hour and 30 minutes, his engine cut out a few times, causing him to concentrate his attention inside the cockpit. During this brief period he lost sight of the other members of the flight, owing to a slight haze in the atmosphere. Having no maps and not knowing his position, he continued to fly around for some time and, as darkness approached, made an emergency, wheels-up landing in an open field.



*Grampaw Pettibone says:*

Don't be a black sheep; make certain you get in the right flock.

# DID YOU KNOW?

## Officers Get Physical Ed Survey Finds Work Required

NAS, CLINTON—Twenty out of 25 naval air stations around the country have compulsory physical training programs for officers, according to a survey conducted by the athletic director here.

The survey showed that requirements are rigid and attendance is mandatory. On two of the stations, physical training was voluntary, and three had compulsory programs only for flight officers and instructors.

Average time devoted to PT work is four hours a week, with 1300 to 1500 proving the most convenient time of day for such a program. The only excuse acceptable for absence from athletics at 15 stations is for medical reasons. Some stations excuse officers for emergency official duties, but in most cases it is required that this time be made up later.

## Three Principles of Safety Signs Remind Flight Personnel

NAS, CORPUS CHRISTI—With the interest of safety in mind, a squadron commander has revised three neatly lettered signs mounted on top of the flight boards in hangar 53 at Cuddihy Field. The signs read AIR DISCIPLINE, AIR SAFETY and AIR COURTESY. Three basic principles of safety thus are kept prominently displayed to all cadets and instructors whenever they are around flight board or on main deck of hangar. New cadets receive a lecture on importance of these three principles when assigned to the squadron.

## Japs Resent Razor Blades Marines Employ a 'Sharp' Trick

That age-old problem of what to do with old razor blades was uniquely solved by a battalion of Marines in the South Pacific. The solution was purely tactical. The Leathernecks used the pesky things to kill the Japs.

"It sounds kind of inhuman," remarked the commander, "and I suppose the Japs will hate me for it. . . . But they had the most annoying habit of whizzing up those jungle trees like monkeys, and then turning into snipers.

"We fixed that little trick. The boys

all pooled their old razor blades and started down the trails pretending to be Jap patrols. Wherever they found good climbing trees, they stuck a lot of blades into the bark fairly high up.

"Then when the Japs came along these trails, we immediately opposed them. They ran madly up the trees about 10 feet—and then suddenly dropped. While they were looking at their torn and bleeding hands, someone would shoot them."

## Local Air Mails Are Busy Stations Shuttle-Bus Deliveries

Aerial shuttle-bus service for mail and freight, started by Pensacola, has spread to other air stations.

NAS, Jacksonville, claims the world's shortest air mail route, organized on one day's notice to serve outlying Lee and Cecil Fields. The service cut average delivery time by 6 hours or more.

At MCAS, Cherry Point, a freight route, known as the milk run, is operated twice daily on Tuesday and Friday to all outlying fields. Both freight and personnel are transported. Business has been so good an additional transport may be added.

## Navy Bond Purchases High Urge Salting Away Part of Pay

The high rate of War Bond purchases at naval air stations was the object of high praise and congratulations by Secretary Frank Knox and Assistant Secretary for Air Artemus L. Gates, both of whom, in recent letters,

paid tribute to the aeronautic organization for its leadership in the Navy War Bond program.

Mr. Gates emphasized the high place the aeronautic organization occupies in both the payroll deduction and allotment programs.

Current figures show that a total of 1,150,000 Navy, Marine, and Coast Guard personnel have signed up for monthly bond allotments, indicating that the advice given in November by Vice Admiral J. S. McCain, Deputy Chief of Naval Operations (Air), is being heeded. That advice: "I recommend that every man salt away a part of his pay in War Bonds."

## Data Sheet for Ocean Hop Marine Pilots Keep Up Records

MBDAG, SANTA BARBARA—A majority of nav hops by MBDAG pilots cover the ocean, giving pilots excellent practice in ship recognition and weather reporting.

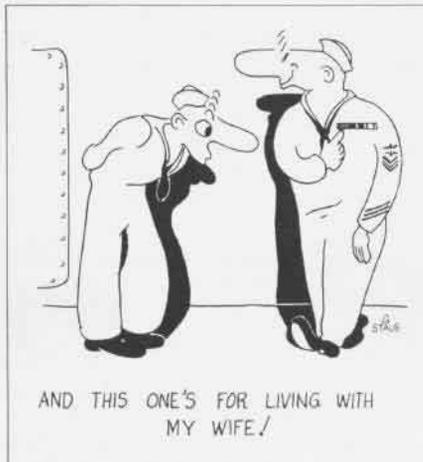
To aid these pilots, group intelligence compiled a small-sized reporting sheet to be placed under the plane chart boards. Space is provided at the left side for time to be recorded—which, by checking pilot's assignment, will indicate position.

Chart sheet included following data: CLOUDS—amount, ceiling, top; WEATHER—drizzle, rain, fog, icing, thunderheads; VISIBILITY; TURBULENCE (flight level); DIRECTION—velocity of winds; SEA—condition of; SHIFT OF WIND; TEMPERATURE; SIGHTINGS—time, bearing from plane, distance, type, course, speed; MISCELLANEOUS—for sighting of oil slicks, etc.

## Navy Reduces Clothing Bill Style Note: Jumper To Be Shorter

By cutting from four to six inches off the length of the blue dress and undress jumper worn by all enlisted men under the rate of CPO, the Navy will save an estimated \$2,000,000 annually as well as conserve critical material.

Before the change was authorized, it was found that many enlisted men were having their jumpers altered to eliminate the bloused effect. The shorter jumper improved the appearance of the uniform and invariably passed all of the rigid naval inspections.



## Link Fliers Spot Planes

### Recognition Training Given

MCAS, EL TORO—In addition to regular Link training, recognition of aircraft and range estimation under simulated flying conditions have been provided by a Mark IX reflector sight. Small model airplanes, constructed to scale, are suspended from the ceiling of trainer room. The distances which they are placed from the trainers are calculated so that models make the same size images in the sight that full size planes would make at calculated distances.

During a period of regular training in the Link, the pilot is instructed through his ear-phones that there is a plane on a given bearing. He is required to find it in sight, recognize it, estimate the range.

## Make Study of Navy Chow

### Mobile Lab to Visit Air Stations

A scientific laboratory on wheels, designed to determine accurately the nutritive composition of fighting men's diets at the time meals are served, is now in use at naval and Marine stations and bases.

The mobile nutrition unit takes samples of prepared foods from the mess halls, quick freezing them if necessary for preservation, and transports them to the Naval Medical Research Institute, Bethesda, for analysis. Equipment is provided for determination of vitamin c content and those food constituents which are not so easily preserved.

The unit will evaluate the food served in terms of vitamins, minerals, proteins and calories. Data obtained will be utilized by medical and supply officers.

## Pilot Gets Homing Signal

### El Toro Adapts Link's Phone

MCAS, EL TORO—Practice in following Z-B homing signals is provided on a Link trainer through a simple adaptation of a signaling device to the regular head-phones. Signals can be given for any bearing, and system is now working on the installation of a regular Z-B control panel in the cockpit of the Link trainer so that pilot can be required to do his own tuning in, the station says.

ATTENTION SQUADRON CO'S!



Do your PILOTS  
KNOW the proper  
VOICE PROCEDURE?



ALL OF THE DILBERTS are not attending U. S. naval training schools, judging from a dispatch radioed back from the Mediterranean war theater about a German Focke-Wulf pilot who apparently was Dilbert's twin. This particular character's name was Mueller. The dispatch follows:



WE FIRST ran across Mueller near Thelepte, north of Gafsa, said Major John Paulk. We had a Britisher monitoring for us on the ground, who would listen to what the German fliers were saying as they came over. He'd relay a translation to us and keep us in the picture while we waited for them. The first we heard of Mueller was at Thelepte when a flight of six Focke-Wulf 190's came overhead. The leader kept calling, "Catch up, Mueller; catch up!" He replied, "My engine's going rough."

We stood around until we spotted five Focke-Wulfs streaking along in formation and, behind them, Mueller.

A few days later the same outfit came over, and the leader was shouting, "Now what's the matter, Mueller?" and Mueller answered, "My ship's not trimming right. I can't keep up." And there was Mueller lagging well behind.

We tangled with this formation regularly and shot down a couple, but somehow never got old Mueller, although he was always sitting back there by himself with something wrong. "Faster, Mueller, faster!" the leader would be shouting, and Mueller would be calling, "Where are you?"

It would go like this: Our monitor down below would radio to us, "Okay, the Hun says he's climbing into the sun. He's getting ready to attack. He says he sees six Spitfires. He's located you boys. Heads up. Wait a minute. Hold it, boys. He can't locate Mueller!"

The next to last time we heard of Mueller was in a big raid when sixteen Messerschmitt 109's came across as top cover for some Focke-Wulfs carrying bombs. The last thing we heard before we stuck into them was the German leader saying, "Where's Mueller? Mueller, now what is it!" But there was no answer from Mueller.

We had quite a show and got one of the Messerschmitts. Five minutes after the fight, a lone Focke-Wulf came smoking in, shooting short bursts aimed at nothing—brpp! brpp! We went for him, and he suddenly did a steep bank and roll, releasing his bomb when he was upside down. It hung there a couple of seconds, and we were afraid it was going to blow us all out of the sky, but it finally fell, and old Mueller went streaking away, shooting short bursts—brpp! brpp! brpp!

We heard of Mueller only once more. The Focke-Wulfs came over Pantelleria and the leader was saying, "Now what is it, Mueller?" and Mueller was saying, "Are you above or below the clouds?" We had a little go that didn't amount to anything, but we've never heard of Mueller since. Don't know whether somebody caught him on the way home or he got lost or if they grounded him, but anyway, there's never been another Mueller. He surely gave us a couple of laughs. [Collier's.]

## BEST ANSWERS

### XV—Math Miniatures

Pick the best choice to complete the statements below, then check your answers on page 40.

1. A cube of ice 1 foot on a side weighs 57 lbs. A cube of ice 2 feet on a side will weigh—

- a—114 lbs.  
 b—228 lbs.  
 c—422 lbs.  
 d—456 lbs.

2. If a number is divided by its reciprocal, the quotient is—

- a—the number itself  
 b—the number squared  
 c—the reciprocal of the number  
 d—one

3. The ends of a string 5,281 feet long are fastened to each end of a level flat surface 5,280 feet long. If the middle of the string is lifted vertically until it is taut, the height is about—

- a—6 in.  
 b—1 ft.  
 c—5 ft.  
 d—50 ft.

4. Consider the earth a perfect sphere 8,000 miles in diameter and surrounded by a metal band. If the band is enlarged so that there is a clearance of 1 foot, the band has to be enlarged about—

- a—8,000 ft.  
 b—4,000 ft.  
 c—6,000 ft.  
 d—6 ft.

5. If a whole number is divided by a proper fraction, the quotient will always be—

- a—larger than the number divided  
 b—less than the number divided  
 c—a whole number  
 d—an improper fraction

6. If a quadrilateral has equal diagonals, equal angles, and unequal adjacent sides, the figure is a—

- a—square  
 b—rectangle  
 c—rhombus  
 d—tetrahedron

## Anoxia Worse Than Cold

Lack of oxygen has a worse effect on navigators at high altitudes than cold temperatures encountered, according to findings at Pensacola NATC.

Four navigators served as experimental subjects in the chilled decompression chamber at the center, undergoing varying degrees of decompression, anoxia, cold. Anoxia produced the greatest deterioration in accuracy.

However, it was found that "if the present regulations concerned with the protection of flight personnel operating at high altitudes are observed scrupulously and no material failure supervenes, performance of duties by navigators should suffer no significant impairment."

In other words, ability to carry on a navigator's duties is not impaired to any greater degree than other air crew duties, by cold and altitude.

One of the navigators in the experiment reported after remaining at 17,000 feet for 30 minutes with no supplied oxygen: "Mind considerably less clear at 17,000 than at sea level. Made several mistakes of a type I seldom make at sea level." The other three reported similar trouble.

To keep a clear head for the mathematical problems and to work speedily, the rules governing use of oxygen must be followed strictly, it was found.

Fliers are advised to use oxygen when going to 10,000 to 12,000 feet for four hours or longer; 12,000 to 15,000 feet for two hours or longer and at all times at 15,000 feet or above.

The octant is affected by high altitudes and during ascent the expansion of gas within the chamber requires the precaution that the bubble not be introduced into the chamber until the altitude has been reached.

The following procedure should be followed for high altitudes: Diaphragm should be in a neutral position and no bubble in the chamber at sea level. Bubble should be formed at an altitude. Rupture of diaphragm results if bubble is formed at sea level.

## Dinner Key Base Enlarged Services Many Visiting Planes

NAF, DINNER KEY—Dredging and filling operations at VR-6's Dinner Key base have increased the size of the operating area to accommodate heavy traffic and station needs, also providing greater efficiency in beaching, docking, and handling flying boats close inshore.

The fill compensated for the area set aside for the new hangar. A great portion of the present area, as well as the new fill, was paved to provide mate-

rially more airplane parking space. Besides a new hangar, the base also has a new enlisted men's barracks. VR-6 services as high as 15 visiting planes a week, including beaching, refueling, handling personnel and cargo.

## PBY Serenade

*Sing to Tune of Red Wings*

*Everything was running smooth  
 All the boys were in the groove  
 Then someone heard  
 The fouled-up word  
 Which hit the boys like an elephant herd  
 O load that PBY  
 You'll soon be flying high  
 From that land of queens, and carefree  
 scenes  
 And hunting submarines*

*O the moon shone down while they were  
 flying  
 Out PBY-ing  
 And sadly crying  
 Now we must say farewell to this old island  
 This PBY land  
 Of happy daze*

*So they loaded their planes real light  
 Not a wing tip float in sight  
 And the PPC's on hands and knees  
 Crawled up front in a damn tight squeeze  
 Then fifteen planes as one  
 Roared off to the rising sun  
 'Twas fifty-two, for Honolulu  
 And those south sea lands of woo*

*O the radar revealed a Nippy cruiser  
 A mighty bruiser, but sure the loser  
 Cause ol' fifty-two was now a-coming  
 With engines humming  
 To deal with same*

*At ninety streaking knots  
 They launched some perfect shots  
 God only knows, those torpedoes  
 Hit fore and aft with crunching blows  
 As fifteen PBY's, like meteors in the skies  
 Moved closer still, to make the kill  
 And all went well until—until*

*O the moon shone down  
 Home, they were steaming  
 Their faces beaming,  
 The admirals screaming  
 "What, fifteen PBY's and just one cruiser?"  
 "What should we do sir?"*

SINK FIVE OR SIX

—PATROL SQUADRON 52





## Makin Island Fell With Tarawa

COINCIDING with the Navy-Marine all-out drive on Tarawa (page 18), attack was launched against Makin, to the northwest in the Gilbert Islands Group. The Marines' triumph in this area was hard fought, but ended a day sooner.

Photos on this page taken by carrier-based naval aircraft show landing boats moving in to the Makin beach, and land obstacles, including zigzag pattern of ditching knifed in to impede

progress of amphibious tanks. A number of buildings remained standing in spite of heavy bombardment. This phenomenon is due to the spongy consistency of the earth which tended to absorb and cushion the normal shock of bomb hits. Craters fill up with water.

Navy photographers flew reconnaissance missions before, during and after invasion action, estimating defenses and assessing damage that had been inflicted.

**1** Landing boats are moving in to the Makin beach. This series of pictures was made by Navy reconnaissance airmen during bombardment of objective. Makin fell on November 22.

**2** Another view shows dense smoke pouring from oil storage bins, caused by direct hits. This worked to the advantage of Marine attackers, creating natural smoke screen for them.

**3** Crates in earth made by heavy bombardment begin to fill up with water. Zigzag anti-tank ditch splits terrain to slow down advance of amphibious tanks across the island.

**4** Frame structure remains standing in spite of terrific concussion of near misses. Impact of bombing on Makin was softened by spongy content of earth peculiar to region.

# DANGER LURKS IN CLOUDS

## Cumulonimbus formations screen danger that is just ahead

A WARM FRONT is usually thought of in connection with a stable air mass. As a rule, cloud forms and precipitation types are of the stable type—altocumulus followed by altostratus with rain and drizzle.

Of particular interest to pilots is the exception to this rule—occasionally the warm air mass flowing upward over the cold wedge is extremely unstable. This instability produces a particularly vicious danger, *viz.*: If a pilot is flying on instruments in the altocumulus or altostratus overcast, his first indication of cumulonimbus in the area often is positive—he flies into a thunderhead.

A short time ago an aerological officer in the South Pacific was a passenger in a transport flying from an advanced base to New Caledonia. Shortly after take-off the plane entered an altostratus overcast at an altitude of 7,000 feet. After about half an hour on instruments, the pilot remarked to the aerological officer, who was observing weather from the navigation hatch, "I sure like to fly in this stuff. It's always smooth, and I get a good chance to brush up on my instrument procedure. By the way, John, we couldn't run into

any severe turbulence while we're in this muck, could we?"

"No, not much! The Cb's only go up to 35,000 in a situation like this," was the disconcerting reply.

The point was really made, for at that moment the plane ran into the edge of a Cb. Turbulence was severe for a short time; passengers were tossed about the plane. Fortunately, cargo was firmly secured. No injuries to personnel or damage to plane occurred.

Then there is the case of the commercial plane on a transoceanic survey flight. The pilot, with several thousand hours of transport time, encountered a Cb in exactly the same way, except that he flew into the middle.

After various cuts and bruises were treated, and the interior of the plane restored to relatively shipshape condition, the engineer looked at the accelerometer which was part of the survey equipment. It had registered 5 g's from upward motion and 3 g's from downward motion in about 20 seconds.

FOR EVERY EFFECT there is a cause. When the cause is known, the cure can be looked for. In this case the

effect is danger, discomfort. The cause is hidden cumulonimbus clouds. The cure is to discover how those clouds can be avoided. There are two definite clues to the possible existence of Cb clouds in a warm front:

► If you find patches of cirrocumulus ahead of the front—a "mackerel sky"—it is an indication that the overrunning warm air of the front is unstable, which means that you are likely to encounter thunderstorms that might be embedded in the warm front cloud systems.

► Secondly, type and intensity of "static" on the radio will give positive indication of any active thunderstorms in the area.

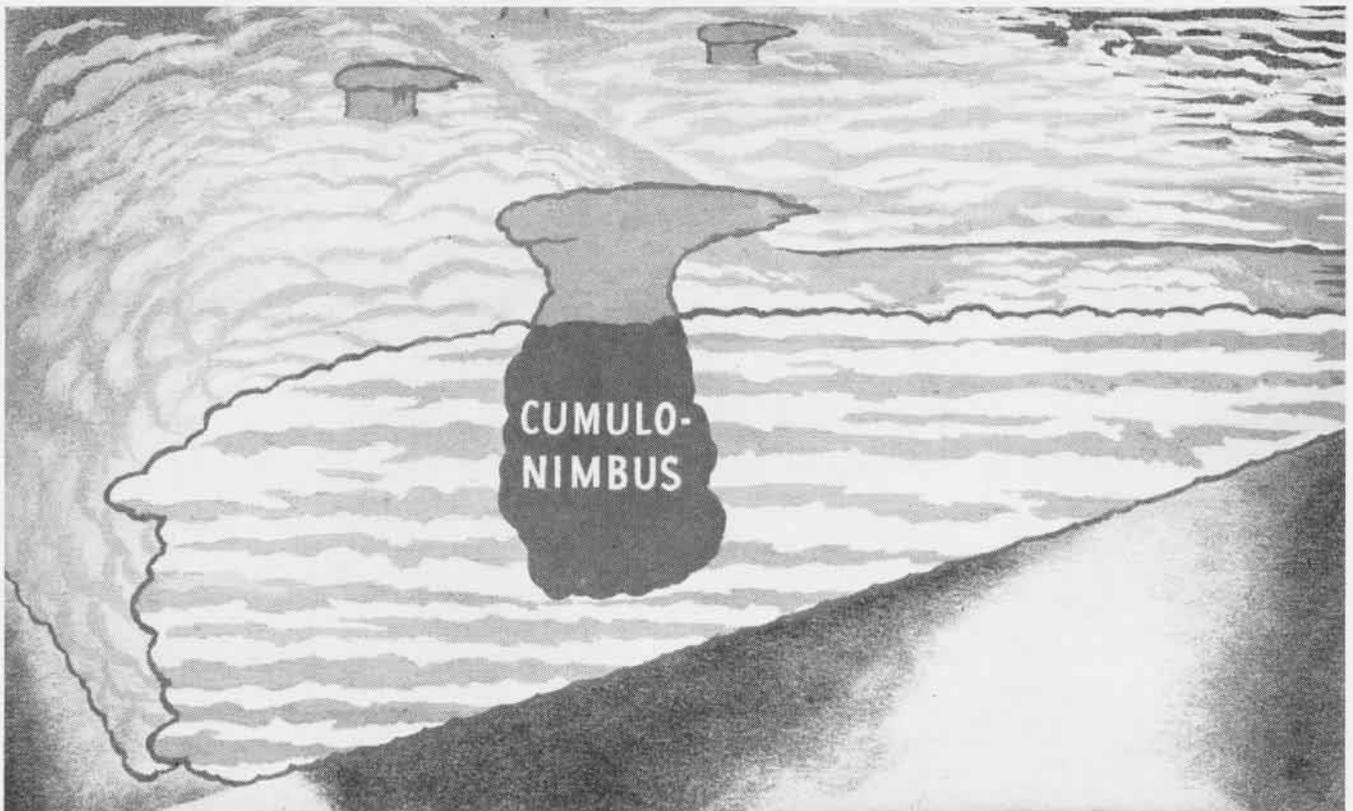
If the two investigations above disclose the possibility of thunderstorm activity over your route—make a flight plan that will avoid most of the danger:

1. Get enough altitude while approaching altocumulus and altostratus deck to get above the overcast—you can then see the towering clouds ahead and avoid them.

2. If overcast is over your own field, and your radio "static" does not indicate thunderstorms in immediate vicinity, get your altitude there in a climbing circle over an area you know about.

3. If performance limitations prevent getting sufficient altitude, or if it would be uneconomical on a short hop, stay low—under the Cb's, where you can see them.

4. If other factors such as local topography, route topography, load factor, prevent 1., 2., or 3.—stay home or turn back.



HIDDEN CUMULONIMBUS CLOUDS ARE CAUSE OF DANGER; ILLUSTRATION ABOVE SHOWS HIDDEN THUNDERSTORMS IN CROSS-SECTION OF WARM FRONT

# MARINE PILOT ESCAPES JAPS AND CROCODILES

## MARINE CORPS REPORT

MARINE LIEUTENANT S. dived down for a strafing pass on Jap float planes. Anti-aircraft peppered his F4U, and immediately the oil pressure dropped to zero. He called his wingman: "Can't stay up. . . . Going down for a landing." He didn't attempt to go overland, but circled to the right so a small island would conceal his landing from the Japs. From Lieutenant S.' report:

I WAS too darn low to jump, and I couldn't get enough speed to gain altitude, so I cut the throttle and made a water landing without power. I barely had time to dive over the left side and clear the tail when the plane nosed over and went down.

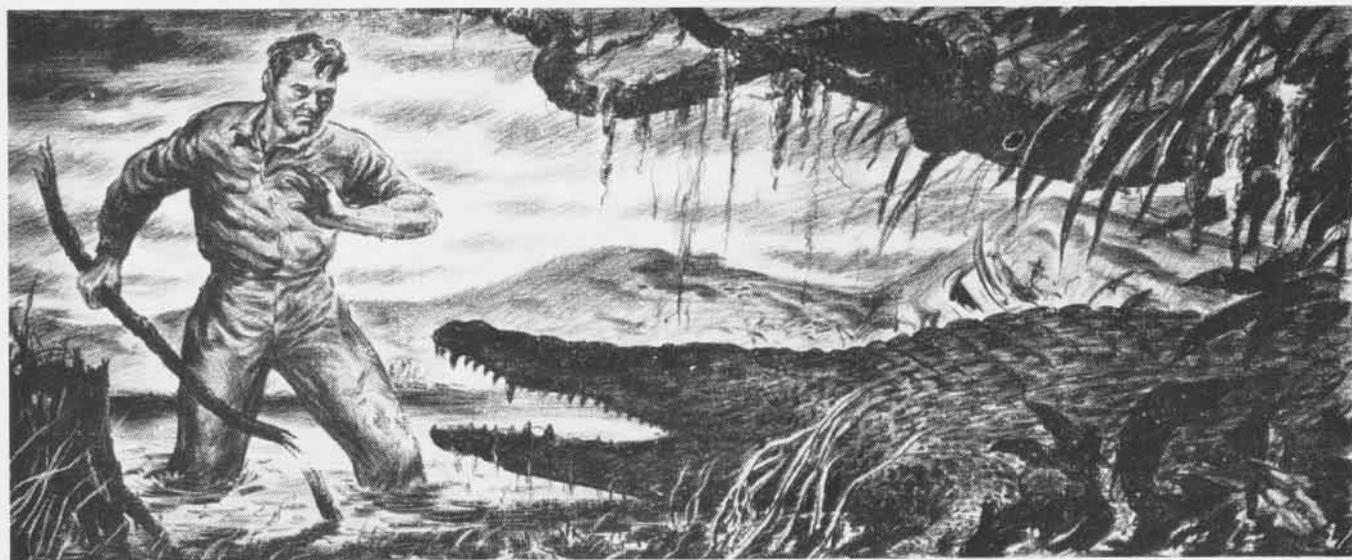
One thing was uppermost in my mind—that was to keep the Japs from

chop" with his jaws, but that didn't worry me. I rolled over, and just accidentally rustled some leaves. He started for me—running fast. Both of us were scared silly. It was a great race. I was running for a tree, and he was trying to get to the water. Each of us made our objective all right, and I never did see him again.

Several days later I was scouting around and discovered to my amazement that I was on an entirely different island than I had originally thought. What's more I had landed about one mile from a Jap outpost. Having seen no Jap searching parties, I figured they hadn't seen me go down, so I decided to risk a daylight trip to the main island in my boat. It took about four hours, including a short rest on the way. No one saw me, although a B-24 circled me quite a few times at about 2,500 feet.

started walking again. After covering about a mile, I came to a clearing and spied a native. I rushed towards him babbling "American," and asked if he would take me to a white man. He said he would, so immediately we started out. Several days later we met Capt. F. who was on his way back to headquarters. I was damn glad to see him. We didn't run into any Japs, but there was much evidence of their activity. We recovered a portable Jap radio and some other equipment. That night I had an excellent meal, slept on a mattress and rolled in clean sheets.

The next day we traveled about 25 miles, ending up in a small village. For some reason, the native children wanted to give me presents. About 50 of those little pickaninnies all gathered around and gave me quantities of beads, sea shells, etc. They sang a lot of songs



seeing me. My dive over the left side of the plane was for that very reason. Now, I decided to lie down in the boat and make myself as inconspicuous as possible until it got dark. I was really seasick—probably from nervousness.

LATE IN THE afternoon I saw someone fishing in a small boat. I wasn't too sure whether he was a Jap or native, but decided to play safe. I covered my face and hands with mud and then violently waved. Was I lucky! He turned out to be a Jap, and didn't see me.

That night I had to chase a crocodile out of the place where I was going to sleep. He was easy to scare, so after shooing him into the jungle, I laid down. I could hear him going "chop

For dinner that night I ate two small juicy crabs and some coconuts. I was really hungry and I think I started eating the crabs before they had even stopped kicking! I spent the night in a deserted native hut fighting mosquitoes, but things were a little better after I covered myself with the rubber boat.

The following morning I started walking east along the shore. The country was so bad that by 1400 I had covered only two miles so I stopped. Here I found a bed of oysters which I ate raw. They weren't very firm, but I was able to keep them down by thinking about lots of pleasant things.

I spent the night there, ate more oysters in the morning, and repeated the same thought procedure. Then I

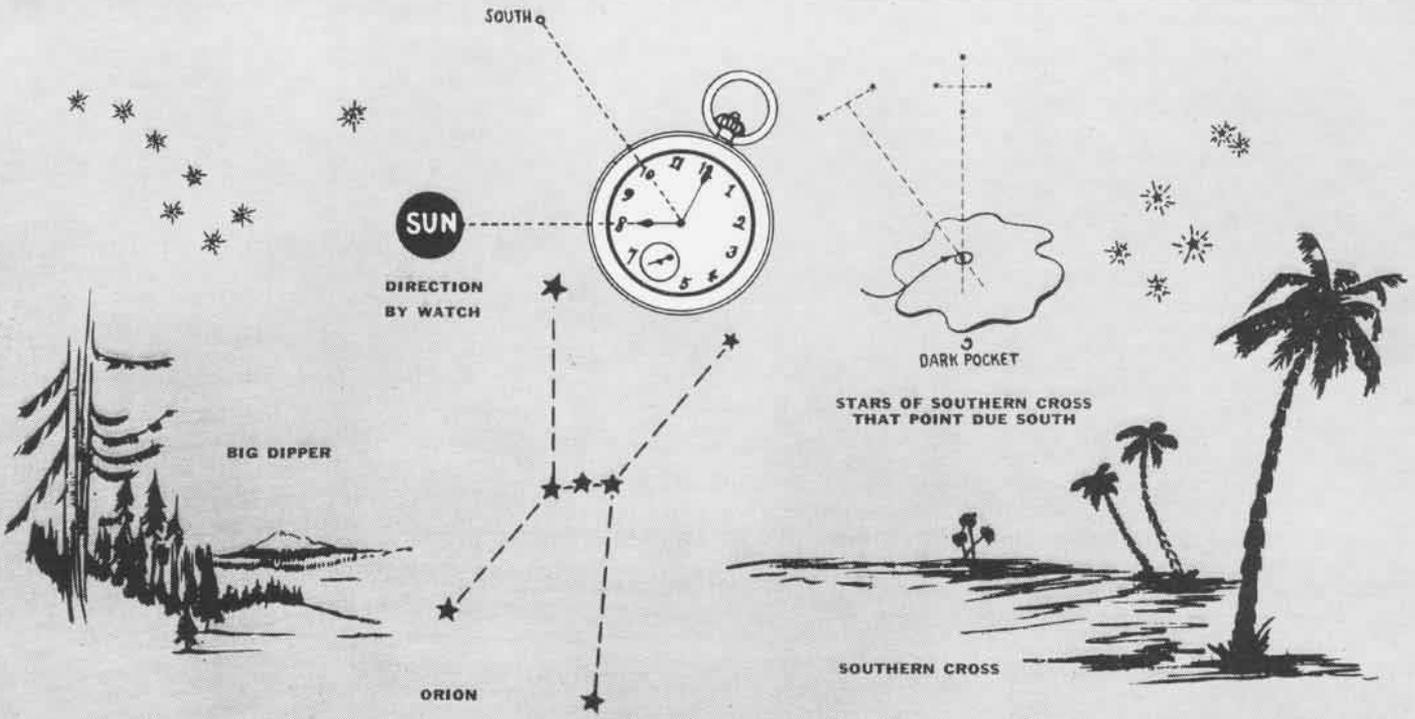
too. I decided to teach them *The Eyes of Texas*, and had to sing it to them about six times, but they got it pretty well. We had a great time.

AFTER ALL'S SAID and done, there's really nothing to fear in the jungle. The natives were very friendly and I traded them a great many of my belongings. Razor blades are very useful for that purpose and from now on I'm going to carry 10 or 12 packages in my pack as well as \$5 in quarters or shillings. That's worth about \$20 in paper money as far as the natives are concerned, and comes in plenty handy.

The mosquitoes were troublesome, large lizards were harmless, and even the crocodiles didn't bother me except when between one and the water!

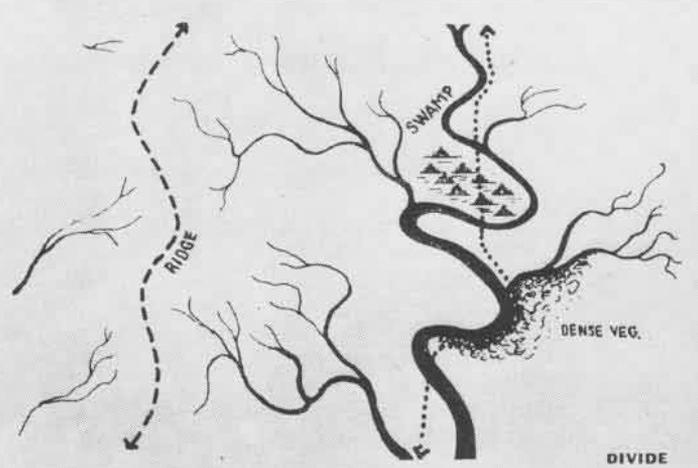
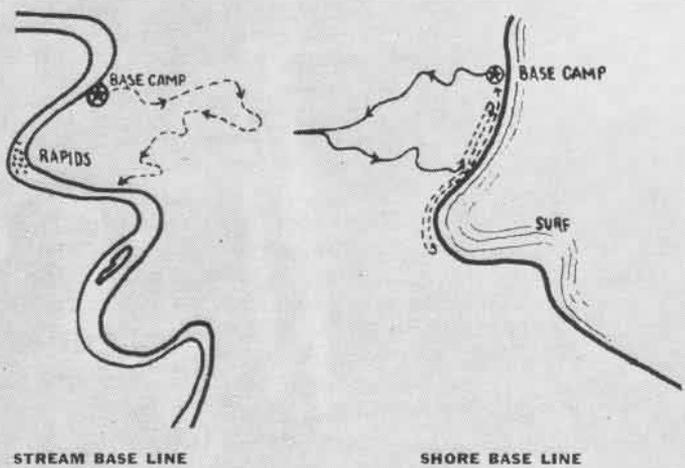
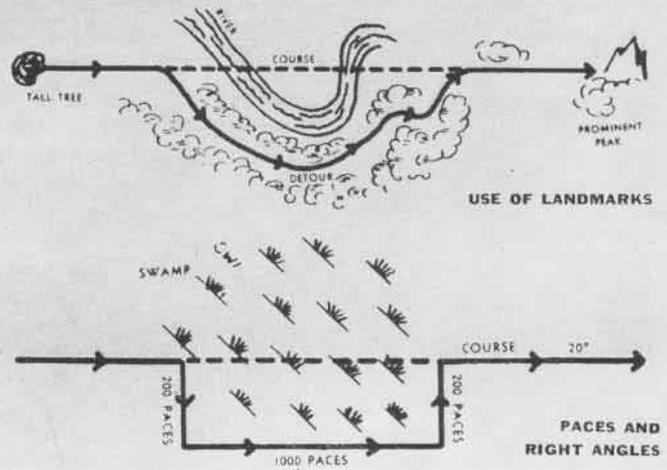
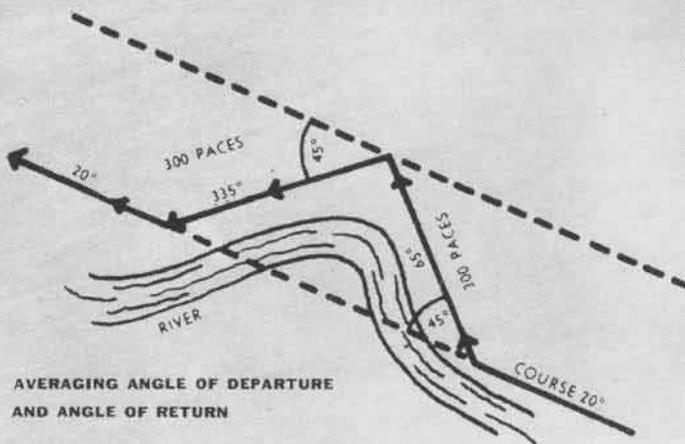
# CELESTIAL GUIDES

On land or sea, the sun and stars—Big Dipper, Orion, and Southern Cross—will guide you home



# KEEPING A COURSE

Angles of departure and return, prominent landmarks, and paces are valuable in making detours



# FINDING YOUR WAY HOME

Worst fears are those of the imagination, and greatest enemy is yourself

**T**HE BEST INSURANCE against getting lost in the event of a forced landing is to study maps, charts and photographs at every opportunity. Notice the general direction of flow of the larger rivers, the direction in which mountains or prominent ridges run, features of the shore line, the location of outstanding landmarks, and their relationship to your base.

If you find yourself lost on land, sit down, think the situation through, and don't be in a hurry to do anything. Before you go anywhere, determine the cardinal directions from sun or stars and lay a course of travel. If you have a map or chart, it will be less difficult for you to establish where you are. The first step is to orient the map—with a compass if you have one, or if not, by the sun or the stars. Orienting a map consists simply of making north on the map coincide with true north.

The sun by day and the stars by night are valuable guides for maintaining a course, but they are not always visible, and you may in any case need to use additional methods. Observe outstanding features of the landscape and concentrate on keeping your course.

If possible, choose a prominent landmark in the desired direction of travel that can be seen en route. Relate the position of the sun to yourself and the distant landmark. As you approach the landmark, line up another farther away. In dense forests where distant land-

marks can't be seen, you can hold a course by lining up three trees. As soon as you pass one of these line up another beyond the next two.

Don't travel by night in strange wooded country except in an emergency. In open or desert country, with the aid of the moon or stars, it is fairly simple and convenient. It may be the only time to travel in desert areas. In rough country frequent detours must be

## SURVIVAL HINTS—NO. 2

This is the second in a series of articles condensed from *How to Survive on Land and Sea*, new U. S. Naval Institute textbook issued by Aviation Training Division of CNO.

**NOTE:** Copies of this book are not available for general distribution. It was provided as a textbook for pre-flight schools. Individual copies may be purchased from the U. S. Naval Institute at Annapolis, Maryland.—Ed.

made, and you should know how to compensate for them to get back on your course. One of the simpler ways to compensate is by paces and right angles, although it requires extra walking.

A shore area may be easy or difficult to travel, but is almost always long and circuitous. Nevertheless, it is an excellent base line and food area, and a good place to "stick to" until you can orient yourself and lay a course for a known objective.

A slow, steady rate of travel with rest as needed will get you much

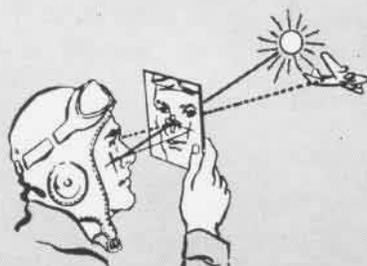
farther in the long run than a rate which will exhaust you in a short time.

Be sure your shoes fit well and that your feet are always in shape for a long walk. Heavy wool socks are best for hiking, even in a warm climate. If you can't change socks, you can at least wash those you have on, since dirty ones chafe and increase the danger of infection.

Attend to blisters or sprains at once. Remove pressure on blisters by cutting your shoes or improvising footwear from canvas, plant fibers, or parachute silk. Wet shoes make the feet tender. Stop and dry them out if practicable. A sprained ankle doesn't always swell or hurt immediately. If you give an ankle a bad wrench, bandage at once. Cold applications and rest will reduce the swelling and pain.

In enemy territory, make use of natural cover and be sure that you have nothing on you that will reflect light or otherwise attract attention. Stop often to look and listen. Move quickly if crossing an exposed spot, and avoid silhouetting yourself against a contrasting background or the skyline. Conceal your trail by traveling on hard ground or in water.

Avoid disturbing animal life. Always look from the dark into the light. When danger threatens, never peer into the dark from a camp fire. By putting your head close to the ground and looking up you can see silhouettes against sky.



**SIGNALING** may be done with a food tin or other material that is shiny on both sides. An aimed beam of light may be effective up to 10 miles on clear days. Punch a hole in the center of the tin mirror and sight through the opening at the "target" with the mirror about three inches in front of the face.



PLANES MAY BE SIGNALLED BY WRITING HUGE MESSAGES IN THE SNOW WITH EVERGREEN BRANCHES

## STREAMS ARE HIGHWAYS, NOT BARRIERS

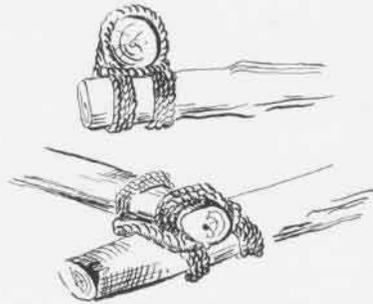
**S**TREAMS, small and large, may present special hazards to you when trying to get back to your base. A stout pole, for use as a brace, will help you cross a shallow, swift stream. If the current is slow and the bottom rocky, keeping your body submerged will take most of the weight off your feet and reduce the danger from bruises. Cross deep, swift currents by swimming diagonally downstream.

In flat country the outsides of river bends generally have steeper banks and deeper and swifter water than inner curves. Cross diagonally and strike the inside of a bend where the water is apt to be slack and shallow. Often the current is slow and shallow at the widest part of a stream. Just above a riffle, water is generally shallow.

Rapids or swift water usually are not as dangerous as they look. Never fight the current. Always swim with it and try to keep horizontal, to reduce the chance of being pulled under. Go feet first, on your back, down fast, shallow rapids, and "fin" your hands alongside your hips for buoyancy and as fenders against submerged rocks. Keep your feet up. Go head first, on your belly,

down deep rapids. Avoid bubbly water.

If you must cross thin ice, distribute your weight, even to the extent of lying down and pushing yourself along. When pulling yourself out of a hole in ice, place your hands on the ice, kick your feet until your body is level, then



RAFT LASHING

swim onto the ice and roll to safety.

The easiest way to follow the course of a stream frequently is to use it as a highway by means of a canoe, dugout, or raft. If you can find a friendly native with a dugout, your travel troubles will be over. Since you may find the canoe and not the native, a little practice in canoe handling will be useful. If there

are no native craft available, you'll have to make and pole a raft.

If you can't find a canoe or dugout, two or more logs bound together will serve as a raft for crossing or navigating a river. Many tropical trees will sink even when the wood is dead, so be sure the wood you choose will float.

While underwater and floating plants make swimming difficult, it is perfectly possible to swim through relatively dense vegetation. Keep calm, don't thrash about, and remove the plants as you would clothing, staying as near to the surface as possible, and swimming the breast stroke, with shallow motions.

Swim, instead of attempting to walk, in any medium that won't support your weight. Muck, mud or sand will support your weight better than water, and you can float in water. The difference is that struggling or lifting your feet while in a standing position in muck or sand will only make you sink deeper. If you feel yourself sinking, fall forward on your face, spread your arms, and start to swim or pull your way along, keeping your body horizontal.

In heavy seas, swim with the wind to your back, keeping as much of your body submerged as possible to avoid wave slap. Plunge through breaking waves; don't attempt to swim over them. Always preserve your strength.

## CARRY STICK WHEN SCALING MOUNTAINS

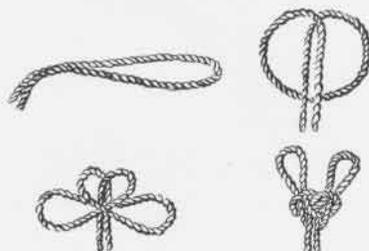
**Y**OUR BEST bet in the mountains is to follow valleys or ridges; do not try to go at right angles. Game trails may show you the best path. If you must climb or descend a cliff, first attempt to choose a route that appears to offer hand- and foot-holds, cracks, and ledges that provide an unbroken path from top to bottom. In vertical descent on cliffs, keep your face, not your back, to the cliff.

A rope for use in descending a cliff can be made by twisting four to six parachute shroud lines together. *Rappelling* is a technique of using the friction of a rope against the body in making a steep or vertical descent. If you're too weak to climb down a rope, you can still rappell down, rest on the way, and save the rope for future use. It's apt to come in handy.

To rappell, pass the rope around a tree or rock where it will not bind. Straddle both ropes and wrap them around one thigh, across the chest, over the opposite shoulder, and down across

the back to be grasped by one hand. Grasp the rope in front of the body with the other hand. The arm that reaches forward is on the opposite side of the body from the encircled thigh. Ease the grip of the hands and drop down in spurts.

The easiest and quickest method of getting down a steep snowfield may be to slide or glissade down, standing, using a short, tough stick which can be dug into the snow to slow or stop your



SPANISH BOWLINE

descent if you should fall. Beware of crevasses which are lightly covered with snow, or invisible from a distance.

Ice crevasses are particularly apt to occur on glaciers at right angles to the glacier flow. They seldom go all the way across the glacier, and thus may be detoured. Test a snow bridge across

a glacier with a long pole before attempting to cross.

Kick or cut steps in a steep snow slope if you must cross it. Be on the lookout for avalanches of snow or rock, especially during thaws or in cold weather after a fresh snow. Rock falls are frequent in rugged mountains.

If you want to go up a palm tree after coconuts, do it native style. Make a small loop from a rope of braided palm fibers or vines, and slip it around your ankles. Then grasp the trunk of the tree with your hands and climb. Hold with your hands as you up your feet, then straighten your body, using the friction of the rope and your feet against the tree to keep yourself from slipping. Another method is to loop the rope around the tree and the ankles. As you pull yourself up, the loop lifts with your feet and binds on the tree.

As for tree-climbing in general, remember to test all limbs before you put your weight on them. Dead limbs are notoriously untrustworthy and any limb is strongest next to the trunk. You can get badly burned from attempting to climb with little or no clothing. Seldom trust your weight on one limb. Distribute it in two or three places.

**IN THE NEXT ISSUE: WATER—YOUR FIRST NEED**



POLE IS USEFUL IN CROSSING SWIFT STREAMS



HEAD FIRST, ON YOUR BELLY, IN DEEP RAPIDS



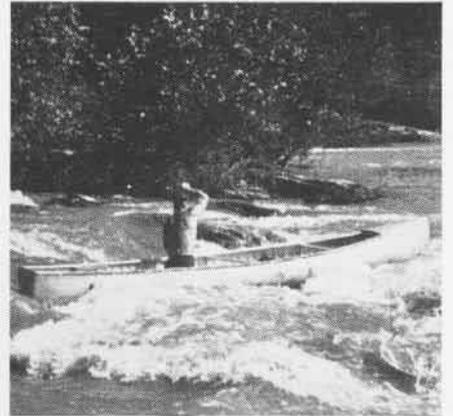
DEEP MUCK, BUT YOU CAN SWIM THROUGH IT



FOLLOWING A STREAM ON A RAFT TO THE SEA



WATCH THE CURRENT; DON'T GET BROADSIDE



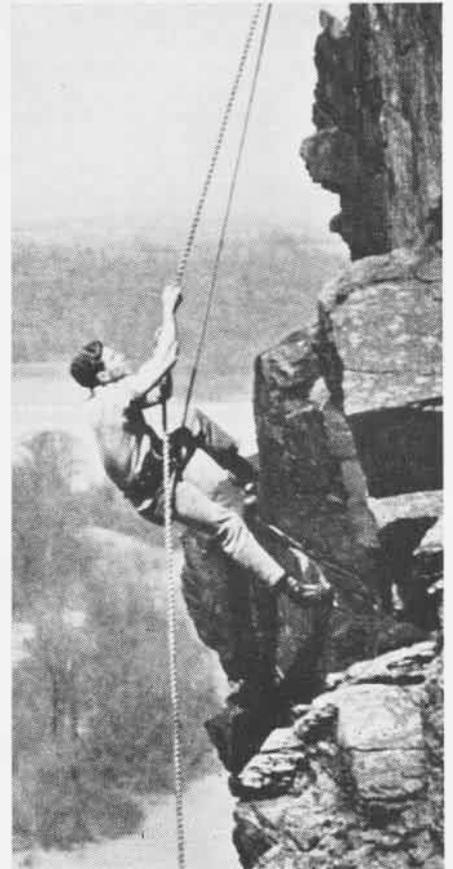
PICK A COURSE CAREFULLY THROUGH RAPIDS



IF YOU'RE TOO WEAK TO CLIMB DOWN, RAPPELL



GLISSADING DOWN SNOWFIELDS IS EASY, QUICK



SPANISH BOWLINE OFFERS SAFETY IN CLIMBING

# SHORE STATIONS

► **NAS, PASCO**—Everybody keeps on the same time on board NAS, Pasco, with the ringing of the ship's bell over the public address system which covers the station completely. At 0700 six bells are heard; at 1200, eight bells, and at 1630, one bell. The bell-ringer is the watch quartermaster.

► **NAS, DALLAS**—For the instructor who thinks his primary students have made just about all the boners possible, here is one student whose headwork has not been duplicated anywhere.

The cadet was in a stage and had his first safe-for-solo check. It turned out to be a down. His instructor looked him up after the check and inquired, "Well, how did you manage to fly a down check? You did all right with me. And then you go out there and make wheel landings."

"Sir, it was all my fault," sadly muttered the student, "I forgot and sent my pants to the laundry."

"You sent your pants to the laundry!" exclaimed the instructor. "Well, tell me what sending pants to the laundry had to do with making wheel landings."

"You see, sir," explained the sad one, "I had a mark on my khaki pants so I would know just how far to bring the stick back. When I discovered I had sent 'em to the laundry, I was sunk!"

► **NPFS, ST. MARY'S**—While waiting for a table in a crowded San Francisco restaurant, two cadets were standing together. Out of the corner of his eye, one noticed that the figure on his right had on a cap, so he nudged his neighbor, thinking it was his companion and whispered, "Take off your hat, dope, you're out of the woods." He stared wild-eyed and red-faced when the neighbor, a full commander, replied, "I've been in the Navy for 17 years and this is the first time a cadet has ever told me to take off my hat."

► **NATC, CORPUS CHRISTI**—It was what might be called an international scramble when an American pilot, flying a German-made plane for the Union of South Africa, bombed Italian installations and was shot down in British territory.

That pilot is now a captain in the Marines and after three years as an officer in the air force of the Union of South Africa is now at NATC, Cabaniss Field, learning to navigate and fly "the Navy way."

Flying a Junkers-86 bomber purchased from Germany by the South Africans before the outbreak of war, the pilot par-

ticipated in a raid and was shot down by the Italians near Somaliland, landing in British territory.

► **NATC, PENSACOLA**—On Christmas, 1918, the Junior Officer of the Day at Brunswick, Ga., was Cadet DALTON DWYER, selected by his commanding officer, Lieut. G. S. GILLESPIE, USN.

On Christmas, 1943, the officer of the Day at NAAS, Whiting Field, was Lieut. DALTON DWYER, selected by his commanding officer, Commander G. S. GILLESPIE.

In both instances, the C.O. drew the "lucky one's" name from a hat containing the names of all those eligible to stand the watch.

Only the titles, location and the hat were different.

► **NAS, NEW YORK**—Contrary to popular notion, the inside of a glider is a very noisy place even though glider planes have no engines and no propellers. Conversation is difficult, if not impossible, when the glider is moving at about 150 miles an hour. Turbulence of the slip stream over wings and about fuselage is what produces the distressing, high frequency random noises, scientists explain.

► **NAS, NORMAN**—The value of motion picture instruction was further evinced in a recent test given Tarmacs. Before the course of 25 full-hour pictures was started, Tarmacs were given two quizzes prepared by BuAer on naval customs, traditions and insignia. Average mark for all 300 Tarmacs was 58%. Upon completion of the motion picture course, the same quiz was given the group and they averaged better than 80%. Approximately 9,000 man-hours of instruction were involved.

► **NAS, PASCO**—This station transferred from NATC to the jurisdiction of NAS, Seattle, in mid-December, to be used as an operational base. The change will replace the hundreds of yellow N2S trainers with formations of fighter type Navy planes in battle gray, manned by pilots, many of whom are already veterans of Pacific air action.

► **NPFS, IOWA CITY**—When the Seahawks form their next cross-country team, they might investigate the qualifications of a seaman guard. Here's the reason: Recently three members of the varsity team asked permission to take "a workout across country," but headed up town instead of toward the golf course. The guard spied them and took off in pursuit in spite of the five-block head start. Impeded by heavy clothes, gun and gun belt, and club, he caught them and herded them all back.

► **NAS, HUTCHINSON**—Synthetic training has made 40 ash trays from condemned materials, each of which has a model plane attached to it as an aid to visual training. Each of the trays has a different type of model and weekly they will be shifted to various offices so that those who work in these offices or ready rooms will automatically study the details of the plane models. The synthetic training officer has used half of a surveyed piston for the container section of the ash tray and 8 in. of condemned internal brace wire from an N2S wing for a stem on which the plane model is attached.

► **NAS, BRUNSWICK**—The Public Works Department is meeting with success in a drive to empty clip boxes and desk drawers of vagrant keys and to find the proper locks for as many of these otherwise useless keys as possible. All keys that cannot be matched up with locks now in use are being turned in to the locksmith for use as blanks, thereby solving what has been a serious shortage.

► **NAS, MEMPHIS**—NATTC can boast of having one of "the biggest little railroads in the world" right within the station limits.

The railroad consists of about 12 to 15 miles of track, a few cars and one engine:



good, reliable "Old 501." The engine is reminiscent of the Toonerville Trolley of comic strip fame.

She's a standard Navy-type and Navy-owned engine. Although 501 weighs only 51 tons, she's rated to pull 1,500 tons of freight. One of her toughest hauls was 21 freight cars fully loaded with slag; they were pulled right over the hill in the Naval Air Station, also serviced by 501.

► **NAS, SAN PEDRO**—During the Civil War a civilian was calling on one of the generals of the Army. While they were talking a young lieutenant came in, saluted and said: "Sir, reporting on the operation I was sent to observe. All objectives have been obtained. . . . But, sir, if we want to win this war, we've got to . . . etc. . . ."

When he finished, the general said: "Son, haven't you forgotten Rule Six?"

The civilian and general continued their talk. Finally, in a lull in the conversation,

the civilian said: "General, if it isn't asking a military question which you can't answer, may I ask what is Rule Six?"

"Certainly," replied the general. "DON'T TAKE YOURSELF SO SERIOUSLY!"

►NAS, PEARL HARBOR—Under the supervision of an officer from this station, the Hawaiian Vocation Schools have been active in furthering the Navy model plane program producing more than 7,500 acceptable models. Salvaged scrap wood from the various departments on the station is used in the model program.

Two students, both of Chinese ancestry, have been awarded "Admiral Craftsman" certificates for having completed over 50 perfect models. Naturally, the war is a close actuality to these students and their proximity to naval activities is a motivating force in creating interest in this program.

►NAS, LIVERMORE—Despite precautions taken to secure all planes at NAS, Livermore, during a 77-mph gale, some damage did occur and all planes had to be "storm checked." Damage consisted primarily of torn fabric, loosened fittings, damaged control surfaces and sand blasted paint surfaces. In addition to repairing this damage, sand and gravel had to be removed from all parts of planes and engines, air cleaners had to be cleaned, brakes and wheels checked and bearings repacked and each plane washed and wiped.

By working night and day, including Sunday, and by utilizing personnel not directly concerned with servicing airplanes, A&R was able to place back in service 250 planes affected within six days after passage of the storm. Test flying of planes commenced immediately after the passage of the storm and cadet training was resumed late the same day on a limited schedule. Total flying time lost due to minor repairs necessary as a result of the storm was two days.

►NAS, DAYTONA—"B-24 to tower, B-24 to tower," came the voice late one Friday night over the radio.

The tower answered, "Yes, yes, go ahead B-24."

"Tell the O.D. to relieve me," fired back the speaker.

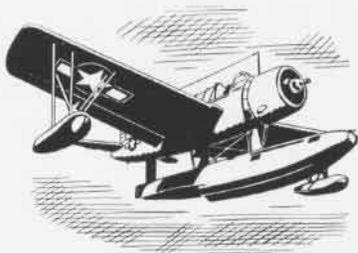
"What the —," said the tower.

"Look, Bud, I've been guarding this Army plane which came in this afternoon for about an hour overtime. I want relief."

Such is the ingenuity of a sailor who hasn't a telephone. This is a true story.

►NAS, JACKSONVILLE—Many people have had an anti-German feeling since Hitler's rise in the early '30's, some since the invasion of Poland in September, '39, and to many it was only crystallized by the sub sinkings. But there is a man in the Marine detachment of NATTC who came out in print against them . . . the day he was born! His name: LEONARD ANTINAZI . . . who has just completed training in the AMM school and is preparing to go out and insert a few exclamation marks.

## SHOW ME THE WAY TO GO HOME



### Geographic Square Search

You are ordered to conduct a search for a PT boat last reported at 0500 in Lat. 27°-09' S, Long. 111°-53' E, on course 124°, speed 20 k. You depart at 0715 from Lat. 29°-28' S, Long. 111°-53' E, flying at 500 ft. Temperature is (+) 20° C, calibrated airspeed 109 k. Wind is 15 k from 090°, variation 4° W.

**Required:**

1. Magnetic heading .....
2. Predicted ground speed .....
3. Estimated time of interception .....
4. Position of interception Lat. ....  
Long.....

You fail to pick up PT boat. Before beginning a geographic square search you take a running wind star with the following results. Altitude 500 ft., temperature (+) 20° C.

MH	CAS	Drift
039°	109 k	9° L
135°	109 k	8° R
094°	109 k	0°
5. What is the wind?	Force.....	Direction.....

Assuming a departure time of 0825 from Lat. 27°-49' S, Long. 113°-00' E, visibility 10 miles, list the times and true headings you would fly for the first five legs in a geographic square search.

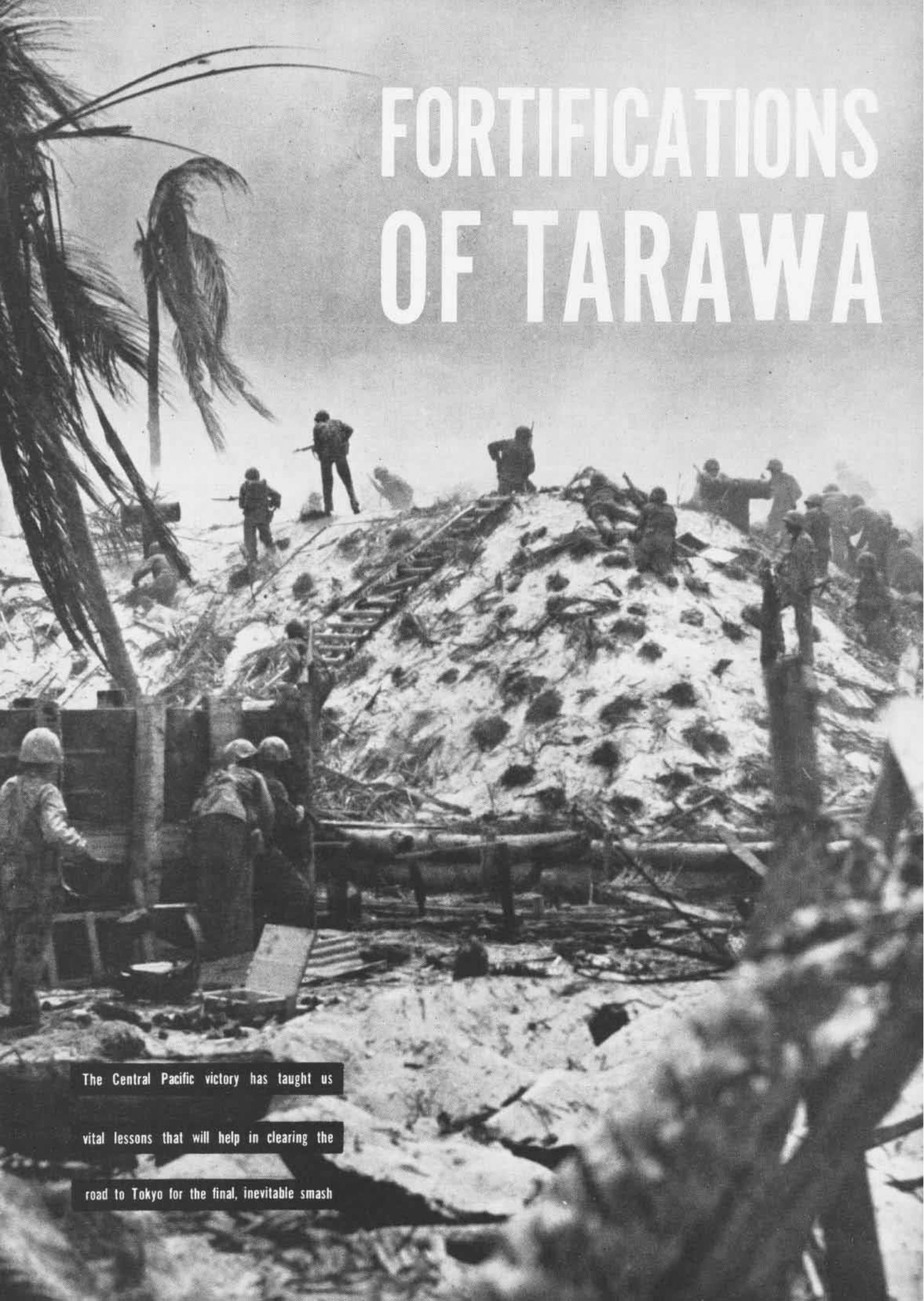
Time	True Heading
6. ....	.....
7. ....	.....
8. ....	.....
9. ....	.....
10. ....	.....

You continue your search until 1000 at which time, with a fuel supply of 40 minutes, you depart from Lat. 28°-09' S, Long. 113°-25' E. Your destination is either Geraldton or the tender whose position at 0703 was Lat. 29°-28' S, Long. 111°-53' E, on course 074°, speed 15 k. With the wind found above, same altitude and temperature and calibrated airspeed of 109 k, which base could you reach with the gas remaining?

11. Return to .....
12. Minutes on leg .....

(Answers on page 32)

# FORTIFICATIONS OF TARAWA



The Central Pacific victory has taught us

vital lessons that will help in clearing the

road to Tokyo for the final, inevitable smash

# Japs Bolstered Bititu's Natural Defenses

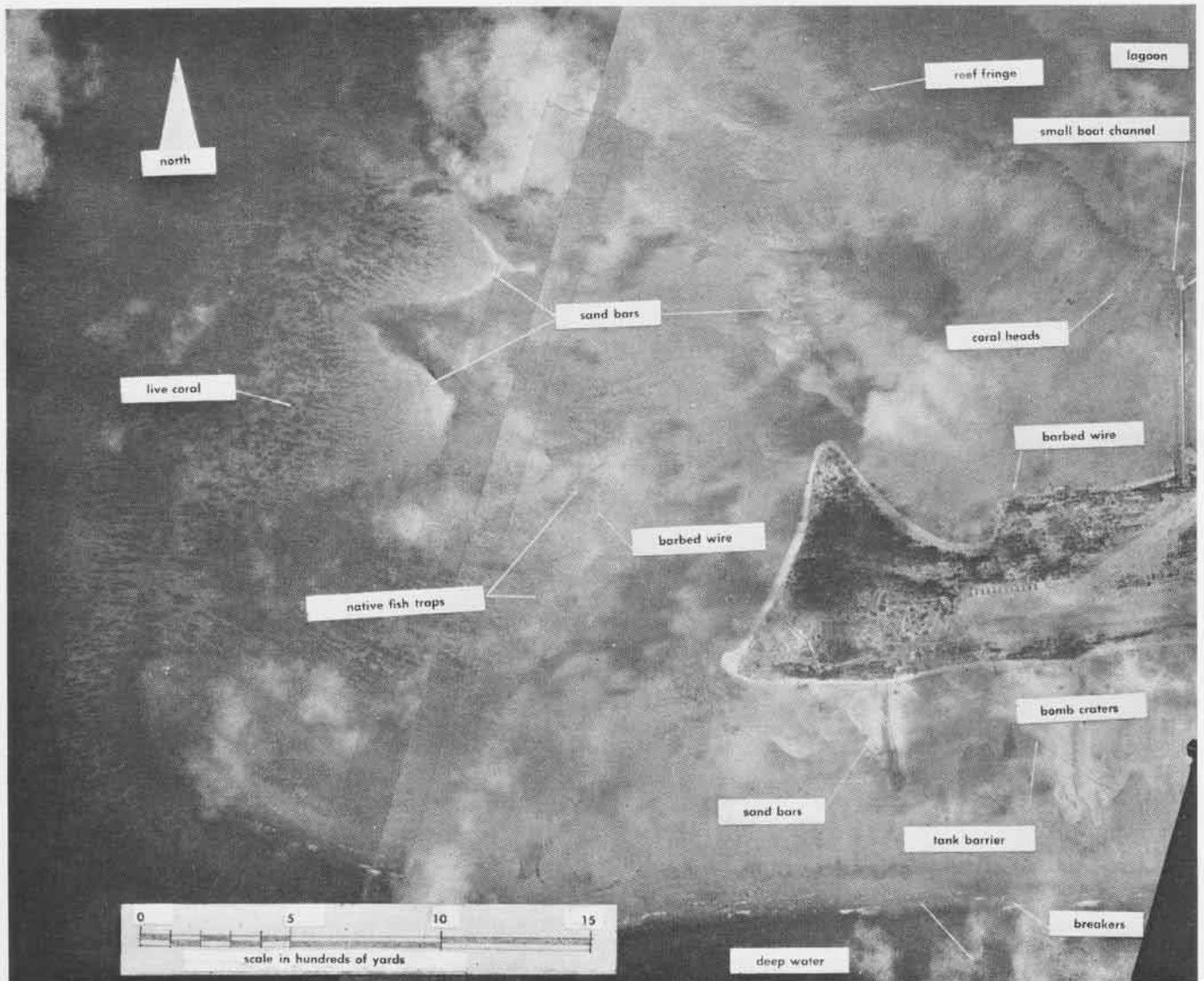
TARAWA in the Gilbert Islands Group is a triangular coral atoll consisting of a chain of narrow islets located on a reef. The islets lie along the east and south sides of the triangle with the lagoon open to the west. Bititu Island, the main objective of the U. S. Naval and Marine assault, is a narrow tapering islet two-and-a-quarter miles long (east to west), and less than half a mile wide (north to south). It is located at the southwestern extremity of the atoll. East of Bititu lie Bairiki Island, former site of the King George V school, Eita Island and Buota Island, on which there are a native village and huts.

In preparing their defenses of Tarawa Atoll, a process which had been carried on steadily until Bititu's downfall, the Japs used every natural obstruction that terrain and surrounding waters afford. To these, and on an extensive scale, were added man-made defenses calculated to stop amphibious tanks and landing barges and troops themselves once they gained a footing on the contested Bititu beach.

Strengthening underwater hazards such as sand bars, coral heads, native fish traps and bomb craters, the Japs rigged up their own patchwork of defenses. The approach to the island had a run of concrete pyramid tank and boat obstructions. A second line of obstruction consisted of a double apron "fence" type of barbed wire entanglement. Both of these defenses were nearly covered when the tide was high, making it difficult for attackers to gauge their hazard value.

Besides these offshore obstacles, beach defenses included trenches, barricades, sea walls of coconut logs, embankments, pillboxes, block houses, barbed wire, rifle pits, machine gun positions and coastal defense batteries. Bititu's shore obstructions incorporated the double apron "fence," backed by randomly spaced coconut trees, inboard of which was a first line of covered machine gun nests. Various sections of the island were criss-crossed by long, wide and deep ditches which were intended to slow down our tanks.

PICTURES IN THIS SECTION WERE TAKEN BY NAVY AND MARINE CORPS PHOTOGRAPHERS. STORY IS FROM REPORT OF PHOTO INTERPRETATION CENTER





PANORAMIC NAVAL AIR VIEW OF BITITU REVEALS CORAL REEFS AND SAND BARS FORMING NATURAL DEFENSES. JAPS HAD ADDED OWN OBSTRUCTIONS

## PHOTOGRAPHY UNMASKS DEFENSE

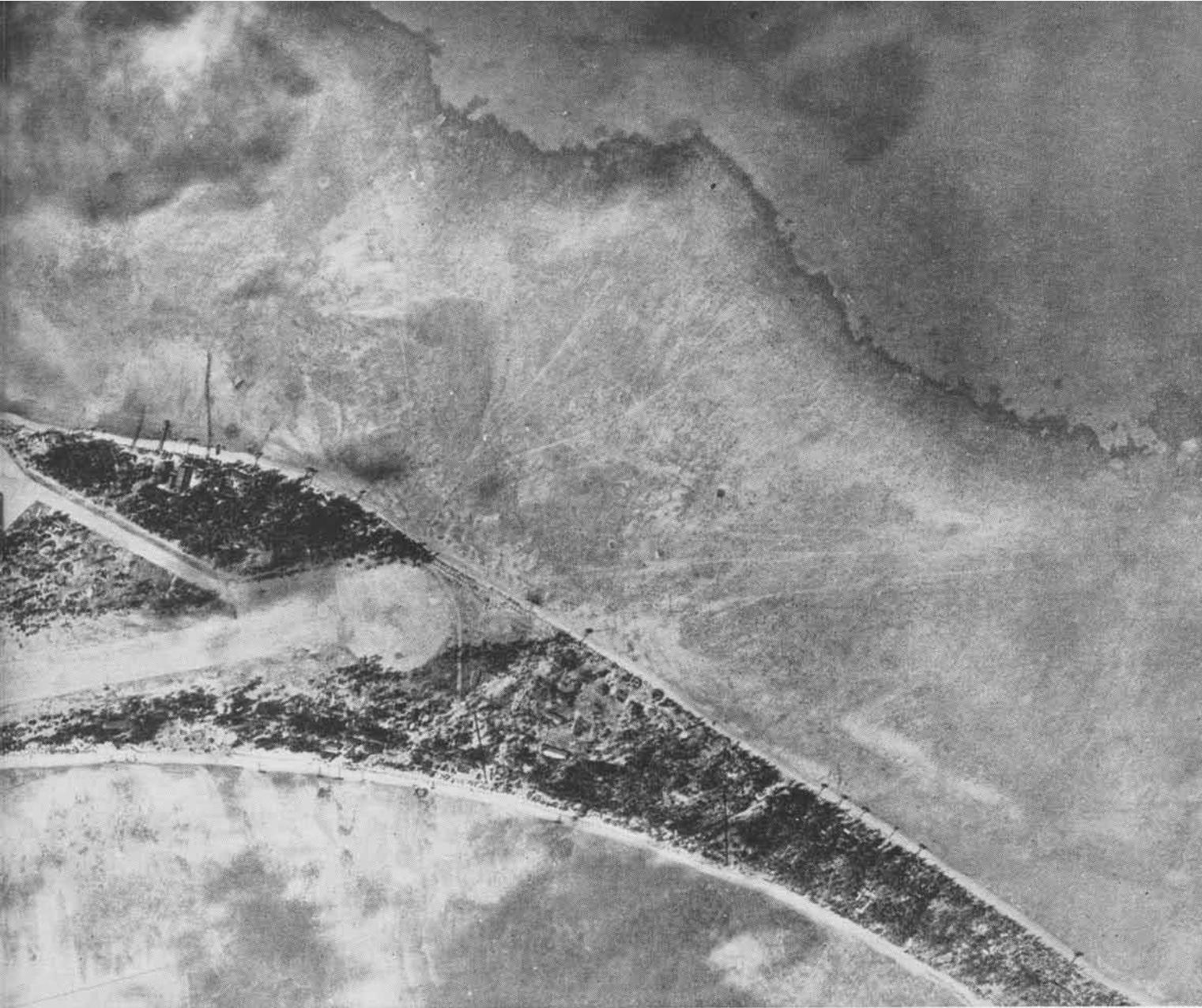
BITITU had been developed by the Japs into a well equipped, defensible fortress. Its airfield provided a runway for operational fighter and bomber planes. The island was equipped with roads for trucking, docking facilities and narrow gauge railroad for hauling, as well as fuel storage tanks. They had erected buildings, observation towers, warehouses, barracks and power plants, amply camouflaged.

Coastal batteries that smashed at the attacking U. S. forces included Vickers 5.5" and 8" guns that were captured from the British at Singapore. The Japs made liberal use of machine guns covered in nests which offered operators protection somewhat similar to pillboxes. Bombproof personnel shelters made of coconut logs, sand and corrugated steel gave Jap personnel protection from the firing of U. S. Marines.

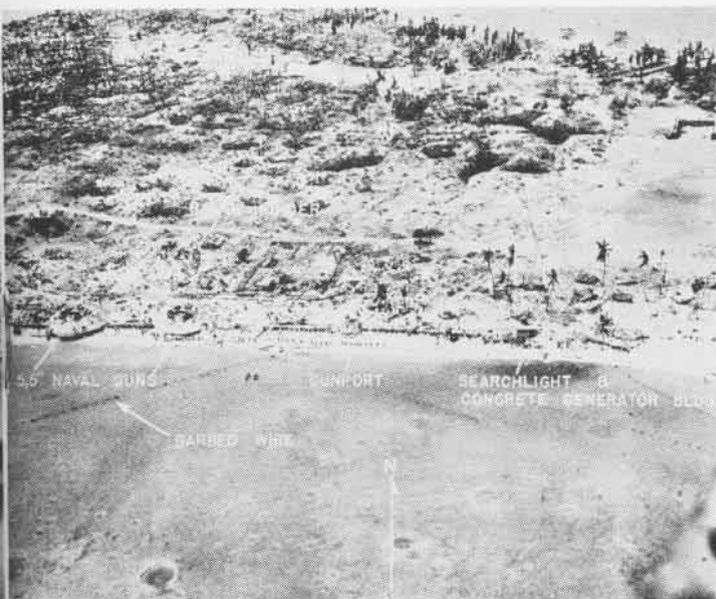
Scenes on this page are aerial views of Bititu taken by carrier-based Navy planes at the time of the attack. The large picture above shows the position of airfield and runways. The three low obliques at the right are sections of the island with obstacles, wire entanglements, sea walls and gunports indicated by Navy photo interpretation officers.



WESTERNMOST TIP WAS FORTIFIED AGAINST ATTACK WITH HEAVY GUNS

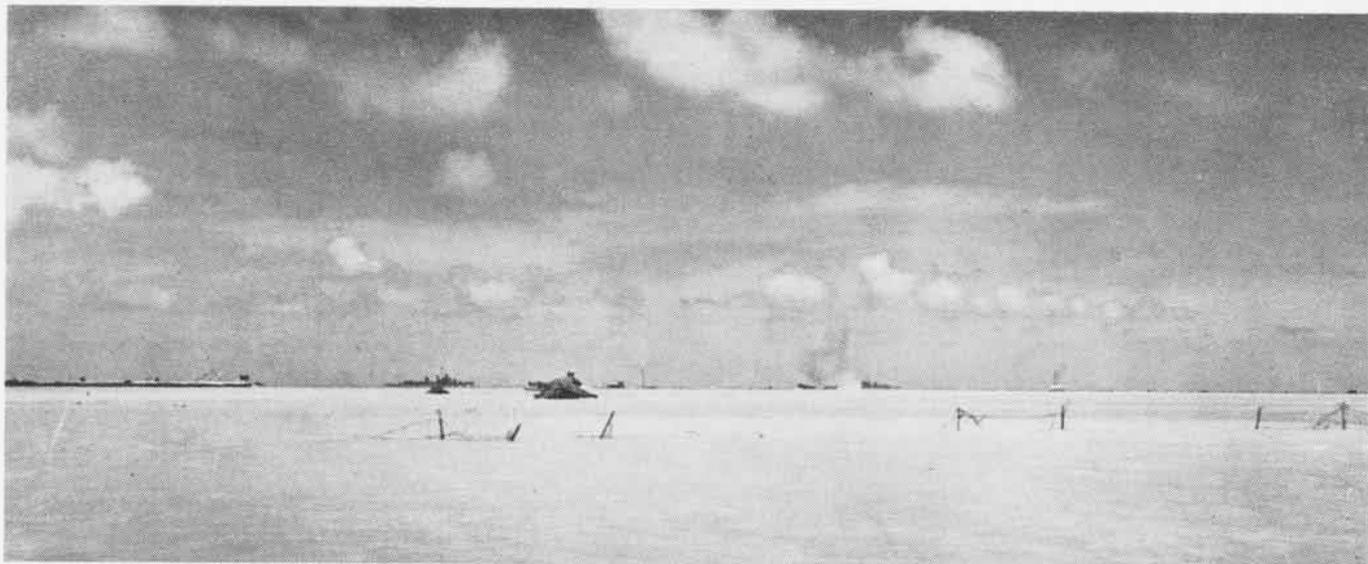


PIER JUTTING INTO THE LAGOON AT TOP HAD BEEN USED BY JAP SHIPS BRINGING SUPPLIES. U. S. FORCES APPROACHED FROM THE OPPOSITE SIDES



FURTHER EAST, AREA REVEALS CONTINUATION OF HAZARDS & DEFENSES

ISLET'S SHALLOW WIDTH IS SHOWN IN LOW OBLIQUE LOOKING SOUTH



SHELL FROM JAP BATTERY HITS AN AMERICAN SHIP. IN FOREGROUND IS PARTIALLY COVERED DOUBLE APRON TYPE BARBED WIRED ENTANGLEMENT



FIRST line of water defense: concrete pyramid boat, tank obstacles. It is low tide and considerably more of base is visible



LANDING boats have made beach past concrete boat and tank obstacles. Japs tried to divert landings to best fortified points

## 1. OBSTRUCTIONS IN WATER

**B**ITITU is a good example of the natural obstructions characteristic of these Central Pacific strongholds. Among the natural water defenses are coral heads, a reef fringe ranging from 2,000 to 5,700 feet off shore and a gradually sloping sand beach averaging 50 feet deep. At high tide roughly one-half of the beach is under water. During low tide the coral reef surrounding Tarawa Atoll is almost dry.

The Japs had strengthened the security of the island by erecting formations of obstacles. The first of these encountered by U. S. Marines were concrete pyramid structures with steel rails protruding at the top. At high tide just the tops of these obstacles were visible. Inboard of these were double apron type fences of barbed wire. The barriers were arranged in V shapes to guide the direction of landing parties to certain points on the beach that were strongly defended. Fire then could be focused on landing points.

While the water obstacles did not forestall the final fall of the Jap stronghold, they added substantially to the offense job of establishing a beachhead on Tarawa.

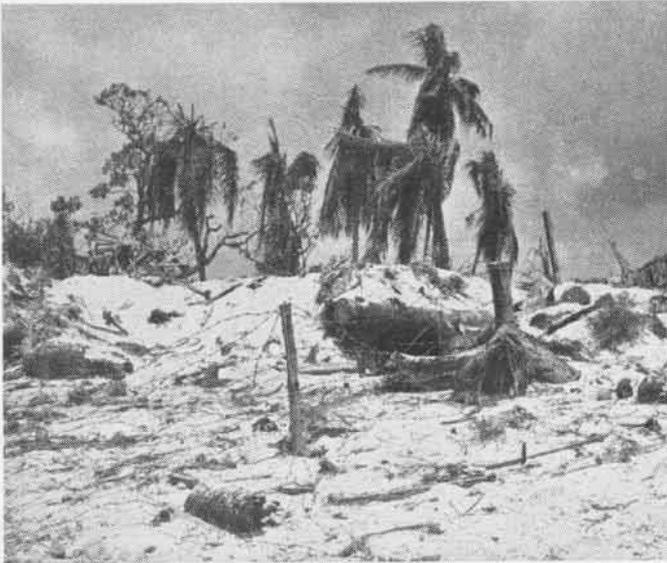
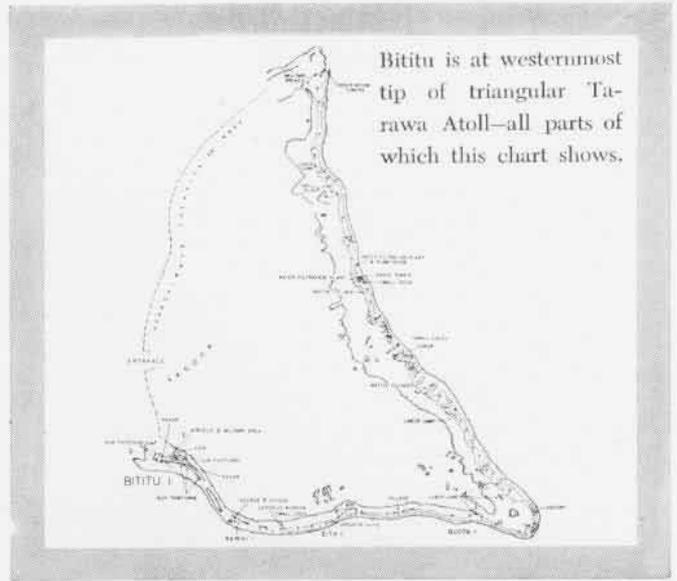


LANDING boat on reef edge with bulldozer in water waist deep. Maze of water obstructions made Marine landing longer process

## 2. OBSTRUCTIONS ON LAND

SHOULD the attackers succeed in gaining the beach, the Japs had lined the island of Bititu with a maze of defense traps, protecting heavily fortified machine gun nests and pillboxes. Not far from the water's edge, the first land obstacle consisted of relatively low sea walls and barricades strongly built of coconut logs, and reinforced with sand and loose coral. Often in front of these were rows of barbed wire entanglement stretched on pegs about a foot and a half above the ground. Sea walls, which sheltered rifle pits and machine gun bays, were erected to fortify Jap defense, but they also gave our troops protection once the enemy was driven from these positions.

Further inland, various types of tank and personnel obstacles were incorporated in the elaborate defense of the island. Rows of posts strung with barbed wire covered the positions of hidden machine gun nests. In various segments the terrain was channeled with anti-tank ditches intended to slow, rather than stop, amphibious tanks.



**SECOND** line of double apron fence protecting machine gun positions. Bititu was strongly fortified, reinforced in every sector



**COCONUT** log sea wall with gunport located at right, concealing Jap defenders. In front is barbed wire entanglement



**MARINES** turned tables and used Jap defenses for selves. Landing force has made beach and is protected behind the sea wall



**TANK** trap's dimensions can be gauged by comparison with Marine standing there. Traps are designed to slow, not stop, tanks

### 3. NESTS, PILLBOX DEFENSES

CAREFUL planning and excellent workmanship were put by the defenders into their machine gun nests and pillboxes. The nests, which were planted at vantage points throughout the island, were of sturdy coconut log construction buttressed with sand and loose coral. Interior views of the nests show double layers of log used in roofing to insure maximum protection from assault.

Pillboxes were of two kinds, concrete and steel. The large concrete command post shown on this page had walls eight feet thick reinforced with steel, making it strong enough to withstand direct hits made by the guns of our ships. Its size can readily be judged by comparison with the Marine standing alongside. Steel type pillboxes were prefabricated, imported to the island and assembled there by bolting the edges together. Being of smaller size, they were of a mobile character and could be spotted around the island at strategic, well fortified positions by the enemy.

The idea of jungle pillboxes is not a new one, but Japanese ingenuity has exploited their use to fullest advantage. At Buna these defenses were found in great numbers, serving as connecting links in a jungle Maginot line, well organized and mutually supporting. The foundation of the pillbox is a trench of varying length and as deep as water level permits. The earth surface at many of these jungle islands is only two to three feet above sea level, which prevents digging traditional deep trenches.

THERE ARE two types of entrances into these shelters. They are direct openings from connecting fire trenches or other tunnels. Usually the entrances are angled so that personnel inside the protecting shelter can escape injury from hand grenades bursting outside. Communication trenches leading from the shelters, being as deep as water level allows, lead to firing positions nearby. Some of the pillboxes have fire slits in the walls, varying from one to two single-rifle slits to many openings providing for numerous riflemen, as well as machine gun position or two.



**STEEL** command post is mobile type brought to Bititu in sections and bolted at corners. Jap inside suggests size of pillbox



**COMMAND** post with concrete walls 8 feet thick withstood direct hits from our ships. Roof parapet is reinforced with sandbags



**MACHINE GUN** nest built with coconut logs and sandbags covered with loose coral. Nest is designed to protect gunnery crew



**INTERIOR** of nest shows two-foot protecting bulwark at farther opening. Notice the thick double row of coconut logs overhead



COCONUT LOG AND CORAL REVETMENTS. THERE IS NO SHELTER OVERHEAD. PURPOSE IS TO PROTECT PLANES FROM FRAGMENTATION BOMBS

## 4. AIR DEFENSE: REVETMENTS

JAP AIR coverage was no match for the furious onslaught of U. S. Naval and Marine squadrons which blasted the island and left it full of crater pocks. The Japs had felled trees and cleared areas for the development of an airfield with runway, taxiways, turning circles, service aprons, dispersal areas. Aircraft had operated from Bititu.

Revetments had been built to protect planes on the ground from shrapnel and fragmentation bombs. These were constructed of log cribbing with sand and coral, standing about ten to sixteen feet high.

Construction of airfields to base fighter and bomber planes has been typical of the Japanese plan in attempting to extend its airpower to zones where their planes could menace Allied shipping. Hacking off Jap air operations in the Tarawa area constitutes another forward step in the march to Tokyo. It also lessens Central Pacific air threats.

CLOSE-UP OF INTERIOR OF REVETMENT SHOWS DESTRUCTION OF JAPANESE FIGHTER PLANE. TARAWA'S FEEBLE AIR POWER WAS SHATTERED





20 MM. MACHINE GUN IN REVETMENT OF STEEL. 4.7 CD GUN HAS HIGH SIDEWALL PROTECTION BRITISH VICKERS GUN TAKEN AT SINGAPORE

## 5. GUN POSITIONS, ARTILLERY

THE PATTERN of defense of Bititu Island called for powerful coastal defense on south, west and north beaches and well fortified AA positions and machine gun nests well encircling the island. Beaches were protected by continuous rows of trenches reinforced with covered artillery positions and pillboxes. Beach barricades incorporated machine gun bays, rifle pits and emplacements for large coastal defense guns, the latter being heavily fortified.

To Tarawa the Japs had brought British Vickers 5.5" and 8" naval guns captured at Singapore. The larger CD emplacement of the British Vickers 8" was raised far above

the ground and made firm by a heavy concrete base which also served as an ammunition storage area. Ordnance included both heavy and medium AA guns as well as numerous machine guns of various types for defense on land. Searchlight and radio apparatus were elements of defense coordinated with the operation of the Japanese land troops.

Contrasted with the raised emplacement of the 8" Vickers gun were coastal defense gunports placed by the Japs along the beach, and well supported by sea wall. Strongly fortified, they permitted a wide range of fire upon targets at sea. Overhead coverage for these gunports was provided by strong rows of coconut logs, with two to three layers of sandbags reinforced with a layer of sand and turf. In the picture below, other mounts for 5.5 naval guns stand out in sharp relief on beach.



THIS STRIKING VIEW REVEALS TARAWA BOMBED AND POCK-MARKED WITH CRATERS. NOTE STRONG COASTAL DEFENSE GUNS IN CENTER OF PICTURE

## 6. HUTS, PERSONNEL SHELTER

**T**YPICAL of Japanese island defense are the bombproof shelters built to protect troops from artillery and aerial bombardment. Similar to the machine gun nests, but somewhat larger in construction, they have two entrances, and are usually located away from the beach, near the camp site.

Massive post and lintel entrances of these shelters are doubly reinforced by heavy iron staples. Log reveting walls are built either by driving logs as pilings into the ground or by laying them horizontally in traditional American log cabin fashion. In some cases walls are double thick. A ceiling course is strung by laying logs laterally, the Japs usually using two layers of logs, sometimes three.

Walls are reinforced by rows of steel drums filled with sand, steel plates, piles of logs or anything else of resistive strength. When shelter has been built above the ground, the entire structure may be covered with earth and sand

mixed with short logs, coconuts and rocks. Fast growing vegetation is utilized to blend the shelter with its surroundings.

The Marines have developed "bunker-busting teams" which work in mutually supporting groups. Missions are divided and one group will operate to snuff out snipers while the other concentrates on blasting the shelters.

Shelters not destroyed in the assault provided some accommodation for the Marines' needs. They "dragged a sniper's body out of a pillbox," one report said, "and we all made a close inspection. We found another and a Marine smashed him on the head with a rifle butt."

The shelter, situated directly on the front lines, served as a hospital for the first two days of fighting, in spite of the constant thudding of Jap machine gun bullets on it.

**T**ARAWA stands out as eloquent testimony to the indomitable guts of the Marine Corps. Not to be ignored is the pattern of vital facts on Jap defense strategy brought out of Tarawa by Marines and naval units, to be turned against defenders of the Rising Sun in the days to come.



**DESTRUCTION** surrounding large bomb shelter marks intensity of bombings. Note smoke still emanating from interior of shelter



**SIZED** beams in place of usual coconut logs indicates finished lumber was imported. Jap warrior is nipped seeking safety



**RUINS** following direct hit on bomb shelter. Impact of bomb has shattered logs that protected roof, which caved into interior



**ENTRANCE** to bomb shelter indicates excellent construction. Jams are housed into lintel and heavy iron staples also reinforce

# NAVAL ACTION IN PACIFIC

**South Pacific Push.** Stepping up the tempo of activities in the South Pacific, guns and planes of the fleet protected new Allied landings at Saidor on New Guinea on January 2 to open a three-way squeeze on Japs in the Ramu Valley, threatening Madang, while across narrow Dampier Strait Allied ground troops consolidated beachheads at Arawe and captured two airfields at Cape Gloucester in their New Britain drive toward Rabaul.

Fleet aircraft made damaging strikes at the Jap base at Kavieng, New Ireland, on January 4, leaving two heavy cruisers ablaze and damaging two destroyers while shooting down 11 of 30 intercepting planes with four probables.

Activities in the Solomons continued with joint Army-Navy air strikes at Jap strongholds on Bougainville in support of jungle fighting ground troops.

**Spot Nazi Fleet.** U. S. Navy pilots in a PB4Y were credited with spotting the German flotilla of 11 destroyers in the Bay of Biscay and shadowing it for six hours until radio signals brought British warships speeding in to sink three and damage others. Navy patrol planes operate in England with the British coastal command of Royal Air Force.

**Sink Jap Ships.** Navy Liberator search planes of Fleet Wing 2 raided Kwajalein, January 11, in a daring daylight attack from low altitude. They sank two small Jap cargo ships and damaged four others, started fires ashore and damaged two Jap planes. There was no interception. Two enemy light cruisers, five small cargo ships and a small transport have now been sunk at Kwajalein and 13 cargo ships were damaged. Army planes blasted other Marshall targets.

**65 Carriers in '43.** Navy Undersecretary James Forrestal has announced that 65 aircraft carriers and 13,617 combatant naval planes were built in 1943. Included among the carriers were six *Essex* class, nine converted cruisers and 50 escort carriers. At year's end the Navy had nearly 16,000 combat aircraft as compared to 5,800 on January 1, 1943, a ratio of over 2.75 to one.

**Atlantic Area.** The Navy Department announced January 5 the U. S. submarine *Pompano* was overdue from patrol and must be presumed lost. Previous announcements revealed two destroyers also were lost, the U.S.S. *Leary* was torpedoed and sank in the North Atlantic on December 24 and the U.S.S. *Turner* exploded and sank six miles off Sandy Hook, N. J., on January 3, cause of explosion not revealed.





**JAPANESE** torpedo plane, intercepted by accurate anti-aircraft fire from *Essex* class carrier in the process of making torpedo run, bursts into flames as torpedo drops harmlessly into sea. Enemy attempts to stop task force raiding Marshalls recently were futile



**AVIATION** gas and Diesel fuel are unloaded at Empress Augusta Bay, Bougainville, by rolling drums down ramp of landing craft



**SCUTTLED** Jap *Zero* in dirt revetment near air strip, damaged by strafing and bombing, abandoned when enemy force evacuated

# TECHNICALLY SPEAKING

## Single Maintenance Crew Cuddihy Merges Its Workers

NATC, CORPUS CHRISTI—To secure maximum efficiency and economy in servicing planes attached to Cuddihy Field, the C. O. has directed setting up a single aircraft maintenance department to serve all planes, replacing the separate departments which previously had existed in each squadron.

Under the new system, the single aircraft maintenance department functions under direct supervision of one aircraft maintenance chief and his assistant. Working under him are an engineering chief and his assistant and a structural and rigging chief and his assistant. Each major sub-division is further broken into units to permit personnel to specialize on a particular type of work.

Personnel of the department is drawn from both squadrons now operating on the field. Experience to date shows that the new system brings about increased efficiency through more centralized control, more uniform work, and more even distribution of work. It also pools the best ideas and methods of procedures from the two squadrons.

A single set of larger equipment is adequate for all planes.

## Computes Fitness Index Reduces Mathematical Errors

A computer has been developed to save time and reduce mathematical errors in reducing physical fitness tests given cadets at three-month intervals



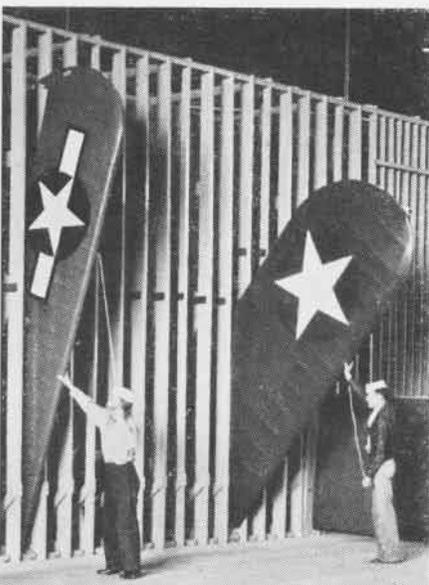
COMPUTER FIGURES FITNESS INDEX WITH EASE

throughout the training period to a fitness index.

The index is computed by a comparison of the recovery pulse beats and the duration of exercise. By using the computer, index is determined on dial.

## Wing Storage Rack Made Shawnee Designs New Device

NAAF, SHAWNEE—Realizing the need to conserve space, A&R Department at this station designed a rack to hold



SHAWNEE A&R DESIGNS SPACE-CONSERVING RACK

spare wings, ailerons, drip pans, and spare parts.

This rack takes a space in the center of the hangar 6 ft. wide, 37 ft. long and 16 ft. high, and will hold 26 wings, 14 ailerons and 85 drip pans. It also has a space behind the aileron and drip pan rack to store airplane spare parts.

Principal feature of the rack is the ease with which wings and ailerons can be stored. Two men can put a wing into or remove from rack with little trouble. A hinged board is attached to the deck of the rack and, when a wing is to be stored, all the men have to do is place the wing fittings into the corresponding fittings attached to hinged board and secure them with a bolt or pin. A line is attached to the strut fitting and the wing is eased into the padded compartment.

► **BuAER COMMENT**—Ideas similar to these indicate sincere thought toward conserving and protecting critical items.

## Way to Patch De-Icer Boots VD-1 Uses Ordinary Wing Fabric

VD-1, PACIFIC—A temporary method of patching de-icer boots with ordinary wing fabric instead of the usual rubber patch has been developed by a chief machinist's mate attached to this squadron.

Photographic planes flying at high altitudes frequently meet icing conditions, even in the tropics. The patch consists of ordinary wing fabric secured over the hole in the boot with three or four coats of aircraft dope in the conventional method of applying patches to torn fabric surfaces.

This patch is practically flush with the surface of the boot and preserves the airfoil contour of the wing's leading edge. Rubber patches supplied the squadron could not be made flush with the boot surface and the airflow ripped them off after a few hours in the air.

Tropical sun probably is one of the main reasons for trouble with rubber patches. Replacement boots were not available in the area nor was the summer fairing available which is used to preserve the contour of the wing when the boots are removed.

[DESIGNED BY C. S. DEITZ, ACMM(PA)]

► **BuAER COMMENT**—The use of dope in contact with rubber is not recommended as a general practice, as the rubber will deteriorate owing to the action of the aromatics contained in the dope. Occasional emergency use of this method for small patches would not be objectionable, however. BuAer has requested the de-icer manufacturer to develop a more satisfactory patching material than they now supply.



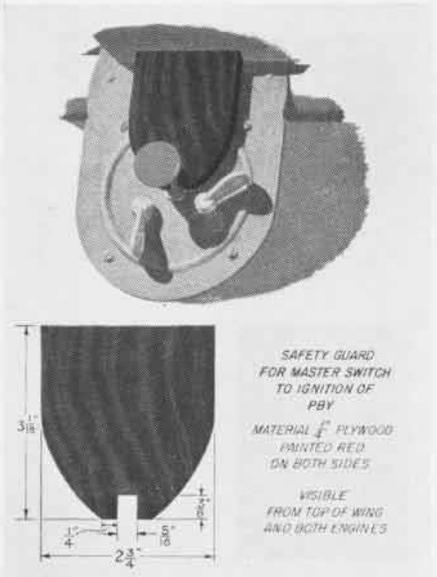
THERE I WAS, FLYING ALONG AT 50 FEET MINDING MY OWN BUSINESS, WHEN ALL OF A SUDDEN I SAW TWO BEAUTIFUL WAVES—AND GENTLEMEN, YOU KNOW THE REST!

## Ignition Safety Guard

### Protects Against Carelessness

NAVY NO. 101—A common failing among mechanics when in a hurry is to turn propellers on PBY's without checking ignition switches. This often results in fatal accidents. Use of a simple safety guard designed by this activity is one method of preventing master ignition switch from being turned on accidentally. When in position, the safety guard, painted a bright red, is visible from both engine nacelles and from the top of the wing. The guard is definite assurance that the master switch is held in OFF position.

► **BuAER COMMENT**—It is suggested that a method of stowage be instituted for the master switch guard, if it has not



already been incorporated. The factor of the "human element" enters into removal of the guard to such an extent that it may be misplaced and lost if a method of stowage is not considered. It is suggested that stowage point be next to master switch.

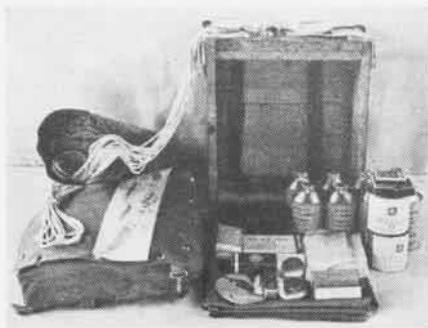
## VD-1 Has Parachute Kit

### BuAER's Is Later and Standard

VD-1, PACIFIC—Dropping supplies to survivors in rubber boats or on isolated islands has always been a haphazard affair. To alleviate this situation, the Parachute Department of this squadron has improvised standard equipment and has adopted a dropping procedure designed to give prompt aid to survivors.

Equipment consists of a parachute, which was removed from a surveyed MK IV parachute flare by competent ordnancemen, and a wooden box, 12" x 12 3/4" x 7 1/2", to which the shroud lines of the parachute are attached. The box contains:

9 chocolate bars . 8 cans of water . 15 feet of line . 2 mosquito head nets . re-



EMERGENCY KIT HAS BEEN USED SUCCESSFULLY

flector . compass . matches . fishing kit . kindle lites . sulfathiazole . atabrine . quinine . strip map of area . malted milk tablets . pemmican . first aid kit.

A one-man life raft may be attached to the parachute. Each search plane carries two drop kits. Several drops have been made to survivors.

The same equipment has been used successfully for dropping film to field photographic laboratories. Two rolls

of film in tins fit snugly in the box. Drop is made from tunnel hatch of PB4Y-1 at 300 feet, 135 mph, directly over the target. It is estimated that 80 rolls of film have been dropped in combat areas without loss or damage.

► **BuAER COMMENT**—Aircraft shipwreck kits of the type described in the September 1 issue of *NANews* are available for dropping to personnel marooned on a life raft. These kits were procured under Contract NOa(S)-923 and are being distributed to central supply points. Spec. M-594 covering this type has been promulgated.

## Color Scale Measures Heat

### Boil Over to Collapse Are Stages

NAS, LAMBERT FIELD—The fire department here is using a heat color chart in its educational program. It was prepared with the assistance of the Newark, N. J., Fire Training School and includes colors which indicate temperature on burning fuel tanks.

### HEAT COLORS OF BURNING CRUDE OR FUEL OIL TANKS THE COLOR CHART BELOW SHOWS THE RELATION BETWEEN HEAT COLORS AND TEMPERATURES

	COLORS	COLOR SCALE	DEGREES FAHR.	
11	WHITE		2200°	READY FOR COLLAPSE
10	YELLOW		1975°	
9	LEMON		1825°	
8	ORANGE		1725°	BLOW OFF OF HEAD SEAMS OPEN
7	SALMON		1650°	
6	BRIGHT RED		1550°	
5	FULL RED		1375°	BOIL OVER
4	MEDIUM RED		1250°	
3	DARK RED		1175°	
2	BLOOD RED		1050°	
1	FAINT RED		900°	

WHEN A BURNING TANK SHOWS FROM FAINT RED TO BLOOD RED AND THEN TO DARK RED (1-2-3) IT IS READY FOR BOIL OVER.

FROM MEDIUM RED TO SALMON COLOR (4-5-6-7) UNDER THE INFLUENCE OF FIRE INSIDE OR HEAT RADIATION FROM OTHER BURNING TANKS IT IS READY FOR BLOWING OF THE HEAD OR THE SUDDEN OPENING OF A SEAM

WHEN A TANK ASSUMES THE ORANGE COLOR OR WHITE CONDITION (8-9-10-11) IT IS READY FOR COLLAPSE



SIGHT SLIDES OUT OF WAY WHEN NOT IN USE

## Mounts Director on Plane Slide Keeps MK-30 Boresighted

NAS, FT. LAUDERDALE—Difficulty experienced with the present method of mounting the MK-30 torpedo director in TBF-1 aircraft has been eliminated by a new method of permanently installing the director on the dashboard.

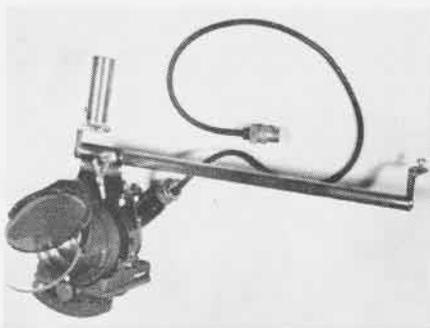
When the pilot wishes to use the director all he has to do is to slide it to the extreme left of the bar and secure it with the T-bolt through sliding adapter. The tip of the T-bolt seeks a hole in the bar, assuring return of the director to same position each time, keeping it perfectly boresighted.

When in stowed position, it is out of the way in case of ground loop or forced landing; yet it is only a matter of moments to return it to "battery." When stowed, the director does not interfere with operation of gun charging handle or with pilot's view of any of the instruments. To install, the only structural change is to drill and tap a  $\frac{1}{8}$ " hole in dashboard.

The ground training department of the station prepared original specifications and will furnish details of wiring and manufacture.

[DESIGNED BY NORMAN S. McEWAN,  
ENGINEERING DEPARTMENT]

► **BuAER COMMENT**—The VTB desk considers this installation an excellent solution to a difficult problem. BuAer has requested three MK-30 director attachments



NEW TORPEDO DIRECTOR MOUNTING FOR TBF-1

from Ft. Lauderdale and is conducting tests to determine any deficiencies such as catapult strength requirements. This arrangement eliminates most of the complaints and should interest all VTB squadrons.

## Devise New Message 'Bomb' Utilize Bomb Rack of Airplane

NAS, NORFOLK—A new device for dropping messages from aircraft was recently made by the photographic section at this station. Features of the equipment are ease of construction, availability of necessary material, simplicity of operation, and adaptability to many types of aircraft, inasmuch as it can be used on any standard bomb rack capable of carrying a 100-lb. bomb.

Installation consists of a fixed outer container, inner container for message,

a length of line attached to a float, and a device for ejecting inner container, streaming line, and releasing it by one operation of bomb release handle.

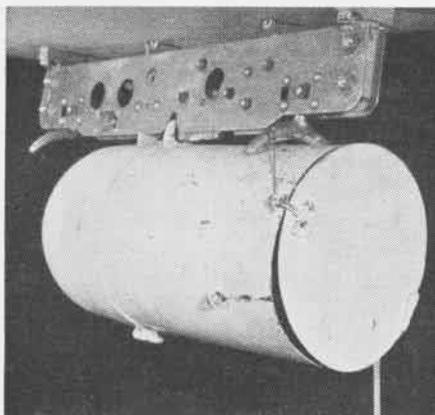
The fixed outer container consists of the forward portion of a standard 100-lb. water filled practice bomb cut to overall length of 18 in. measured from nose. A small tab is welded  $1\frac{1}{2}$  in. forward of suspension ring; a circular cover of 0.050 sheet iron is attached to rear by hinge at one side and heavy wire hasp at the other; tongue of hasp is drilled to receive a small pin attached to bomb release wire so, by tripping bomb release, hinged cover opens.

Inner container is a standard aerial film can to which is attached a 300-foot length of waxed  $\frac{1}{8}$ -in. white line. At the other end of this line is attached a  $\frac{1}{8}$ " x  $1\frac{1}{4}$ " cotter pin. Four inches from cotter pin a block of wood painted yellow chromate is placed which serves as a float for unit. A  $\frac{3}{16}$ -in. hole is drilled in nose of bomb to receive cotter pin.

Across the rear of fixed container a 17-in. length of bungee cord is securely anchored at one side, and hooked over opposite rim with a small wire hook. Two wire yokes are soldered on base of inner message container to accommodate this bungee.

Assembly of the unit follows:

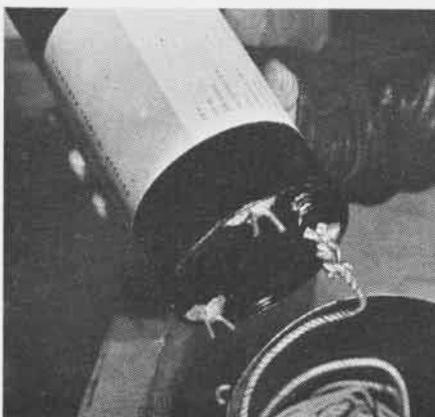
1. Insert message in inner container, cover, and secure with adhesive tape.



ATTACH INGENIOUS CONTAINER TO BOMB RACK



COTTER PIN RESTRAINS LINE UNTIL STREAMED



LINE IS FLAKED; MESSAGE CAN IS ATTACHED



BUNGEE TENSION EJECTS CAN WHEN RELEASED

### ANSWERS TO GEOGRAPHIC SQUARE SEARCH

1. 040°	6. 13 minutes	090°
2. 102 k	7. 11 "	010°
3. 0823	8. 18 "	270°
4. Lat. 27°—47' S	9. 22 "	170°
Long. 112°—57' E	10. 40 "	090°
5. Force 20 k	11. Tender	
Direction 090°	12. 36 minutes	

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

(See page 17)

2. Insert cotter pin through hole in nose of fixed container from the inside and spread pin not more than 45°.

3. Flake in entire length of line.

4. Place yokes of inner container over bungee, and force into fixed container.

5. Close rear cover and mount fixed container on bomb rack, securing cover with pin attached to bomb release wire.

To operate, pilot pulls bomb release handle, thus pulling pin out of hasp. Tension of bungee on inner container forces cover open, ejecting inner container. Weight of inner container streams out the line. Other end of line is restrained by cotter pin until the line is fully streamed out, at which time entire line, together with wooden float, leaves the fixed assembly.

Weight of entire assembly as described, including message container, but no message, is 9 lbs., 6 oz.

► **BuAER COMMENT**—In view of the simplicity of this device and availability of all material required to manufacture the parts, it is believed interested activities can make up units to fill their own needs. However, BuAer would appreciate comments from activities on desirability of this equipment as a standard stocked item.

## Note on Averaging Sextants Type Control Affects Reading

Recent exhaustive tests in England show that errors in sextant sights taken in planes on manual control may be from two to four times greater than sights taken from the same planes on automatic control.

Most errors in sights taken in aircraft with bubble sextants are caused by accelerations, and vary directly as the change of course on a beam shot, or the change of ground speed on a fore-and-aft observation. Accelerations in a plane on automatic controls differ in both degree and kind from those under manual control and affect the bubble accordingly. For these reasons BuAer recommends that, whenever possible, sights be taken from a plane when it is on automatic controls.

To average out errors of acceleration, BuAer is providing sextants which average 60 readings over a period of two minutes. The longer the period of observation, the less the resulting error. However, it might occasionally happen that clouds or other conditions may make a one-minute sight necessary. BuAer's Instruments Branch would appreciate receiving comments on the averaging sextants from those who have used them in service, and opinions on the desirability of a one-minute averaging device for the sextant.

# TOKYO TALKS

## —TO EAST ASIA

Tokyo claims that Germany is as strong as ever, and Japan is becoming more powerful, while Britain and America, who up to the present have "preserved their manpower from serious decimation" by letting Russia and Chungking fight Germany and Nippon, "from now on have to throw their own men into the struggle. Thus, in decisive actions which are still pending, the enemy will have to pit his own forces against Japan and Germany, both of whom had once beaten him to a pulp, and would do so again with relish."

## —TO JAPAN

"The enemy's personnel losses aggregate 399,000 during the first two years of the War of Greater East Asia, testifying to the fatal sacrifices in men and officers already paid by the enemy, and presaging heavier losses in the future. Japan will intensify its 'bleeding strategy' by which the destruction of three of the enemy at the sacrifice of one of our men will be our aim."

## —TO CHINA

Highlighting the losses claimed to have been inflicted on Chungking, Tokyo radio points out an announcement by the South China Expeditionary Force, and reprimands Chungking for her "blind resistance against Japan," strongly pointing out the fact that her "aimless resistance is absolutely futile."

## —TO JAPAN

Japan's naval observers suggest the possibility of a decisive fight between the U. S. and Japanese Navies. Such a contest would be "highly welcome to our naval strategists," as it would give Japan the "long-looked-for chance to engage the main force of the enemy fleet in a decisive battle in Pacific waters."

## —TO EAST ASIA

The Japanese Navy has adopted an "informal" khaki-colored uniform to be worn by "all alike—from commander to the ordinary navy man." The new uniform will be the fifth now in use—"full dress, formal dress, ordinary formal dress, and military uniform. The style of the new naval uniform is as follows: The shirt will have four golden color buttons and an open collar. A necktie will not be used. The trousers will be full length and the cap will be the same style as in the fighting fronts."

## —TO NORTH AMERICA

In the new "Hinomaru Hour"—war prisoners' program—a narrator suggests: "Two long years have passed and this warfare has settled nothing. So why not try the sane, the civilized manner of settling differences at a peace conference table instead of draining the blood of the young men of both nations upon the field of battle until there is no more to drain? Let's hope that each new day brings us closer to the time when the nations of the world reach a satisfactory understanding."

## —TO ASIA

The Japanese Rubber Control Association has named 12 chemicals whose supplies will be further "regulated" as part of the effort to increase rubber supplies for aircraft production. The procurement situation among the chemicals is "relatively satisfactory" in comparison to the "difficulties" existing among other "secondary materials" of the rubber industry.

## —TO JAPAN

"Upon viewing recent enemy operations, the outstanding fact is that the enemy is attacking our bases with a naval fleet comprising powerful aircraft carriers as its main strength. The most important reason for the United States Navy's being forced to adopt such a strategy is that the enemy intends sufficiently to utilize air force power, which is effective in attacking." The broadcast tried to make the point that despite American "defeats"—a statement made necessary by the recent Japanese propaganda hoaxes about sinkings off Bougainville and the Gilberts—the "enemy is continuing to advance most persistently. The United States and Britain are a great enemy and at one time were the greatest and wealthiest nations that ever existed on this earth."

## —TO EAST ASIA

"The tommy-rot that the Anglo-Americans rehash day after day about their Chinese and Russian Allies and the common fight of the United Nations for the liberation of the entire world is certainly getting very stale."

## —TO JAPAN

Anticipation of "big raids by enemy planes" and reports on "the actual condition of the recent bombings of cities in Europe" inspired a new air defense law that will result in the partial evacuation of Japanese industrial cities and the decentralization of war production facilities. "Putting aside matters of the extent of small fires, there was doubt as to whether big, widespread fires could be coped with as expected, and so this measure was formulated."

## —TO ASIA

"The war situation in the Solomon Islands group and New Guinea continues to become more fierce and the enemy continues to attack and attack. We will need to watch against the fact that the enemy continues to attack and attack no matter how many times he is defeated in his desperate attempt to hold advanced bases."





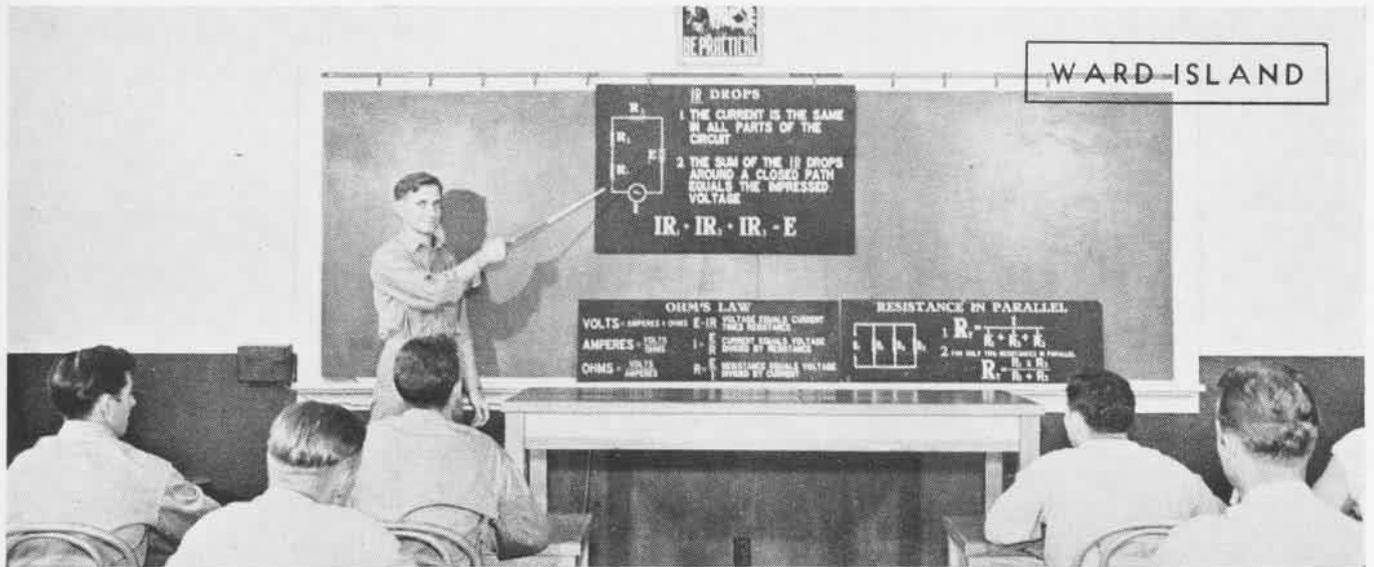
AT END OF TRAINING COURSE, ART STUDENTS GET PRACTICAL EXPERIENCE MAKING AND REPAIRING INSTALLATIONS ON MOCKUPS AND REBUILT PLANES

# HOME OF THE ARTS

WARD ISLAND'S NATTC, isolated from curious eyes on the 225-acre island between NAS and Corpus Christi, produces all naval aviation radio technicians needed for fleet, shore station and flight duties. Candidates must have previously passed a three-week course in mathematics and then a three-month primary course in a Navy designated college before being accepted for advanced training.

The fledgling ART, upon arrival, is given a course in general and specific

radio and power supply circuits, then specializes on servicing and maintaining all types of naval aviation electronic equipment. Two weeks in the hangar put the finishing polish on the student. Finally, after ten full months of training, he graduates as an ART2c and may be found at any place where there's a Navy plane or lighter-than-air craft. With his knowledge and his hands it's his job to keep the equipment working that will help locate and track down enemy submarines, planes, and ships.



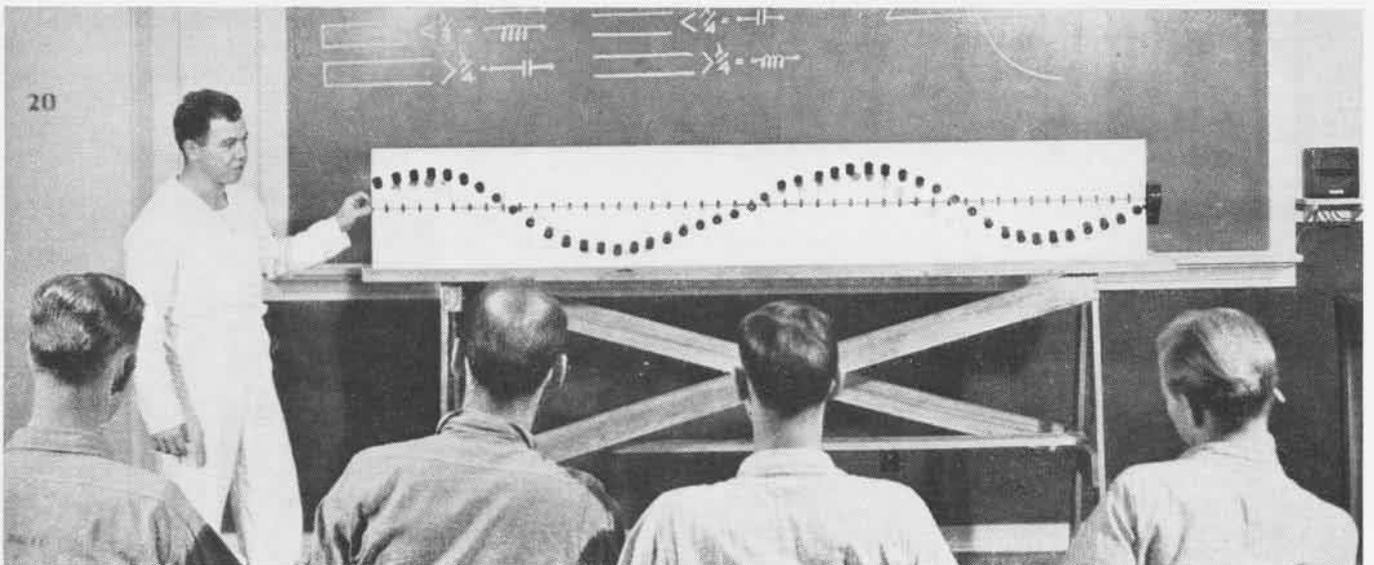
**THEORY** and fundamental facts of general radio circuits and power supplies used in the Navy are introduced, the specific

circuits of fleet radio as well as receivers, transmitters, direction finders, frequency meters, altimeters and the like



**EVERY** mechanical device is used to illustrate graphically and indelibly to classes the actions of electrons. Students

learn in classrooms, from demonstrations, and in laboratory periods, working with hundreds of actual operating circuits



**RADIO** equipment trouble-shooting, servicing and repairing experience comes from laboratory exercises where students in

training follow schematic diagrams to locate trouble, solve mysteries of condensers, resistors, plentiometers, switches

## Shows Mechanics of Gyro Similar Device Tried at IFIS

NATC, PENSACOLA—A device for instrument flying showing operation and use of gyro instruments has been developed by an aviation machinist's mate at NAAS, Whiting Field. For basic instrument instruction, the device is used to show students the mechanics and action of gyro instruments. The unit also is valuable in teaching mechanics, operation and care of the vacuum system which actuates gyro instruments of an airplane.

Instrument panel for the unit was salvaged from the rear cockpit of an SNV-1. Stand is constructed of two-inch pipe with a base of three-eighths-inch boiler plate. Four one-inch-square blocks are welded on bottom side of base to make it set level on an uneven deck. Device is powered by a one-third-hp electric motor driving an SNJ-4 vacuum pump through a flexible coupling. Vacuum line is three-eighths-inch aluminum tubing with flexible hose connected to panel end. Hose is attached to a vacuum regulator.

Vacuum regulator is set to three inches of mercury and is connected to a suction gauge, a directional gyro, a turn and bank indicator and a gyro



SHOWS GYROS' USE

horizon. An oil reservoir, mounted near bottom of stand, is connected to oil holes in vacuum pump. Oil entering pump mixes with outlet air which, in turn, goes through an oil separator. Air then escapes and oil returns to reservoir.

Panel is connected to stand by swivel joint, allowing it to be tilted at any angle to represent attitude of plane.

**COMMENT**—A similar device was tried at IFIS, Atlanta, with negligible results. This unit, however, seems to have a certain amount of worth, but it is still impossible to duplicate plane performance and instrument indication during yaw or turn. Attitude indications are reproduced by the horizon instrument alone, tending to solidify importance of the horizon instrument in the student's mind. Indications of all six flight instruments must be considered when judging attitude of a plane.

## Kit Handy for Gun Storage

### BuOrd Wants Air Crew Armed

VP 204 has developed a gunnery kit as part of the equipment carried on all operational flights, containing eight loaded Smith-Wesson .38 double action revolvers in shoulder holsters, a Thompson .45 M-1 submachine gun with two 20-round clips and extra ammunition.



Advantages of keeping all arms in kit instead of issuing them to individual crew members are:

1. Positive check that all guns are clean, loaded and ready for instant use.
2. Prevents accidents.
3. Kit is kept with emergency equipment and life rafts in event of forced landing.

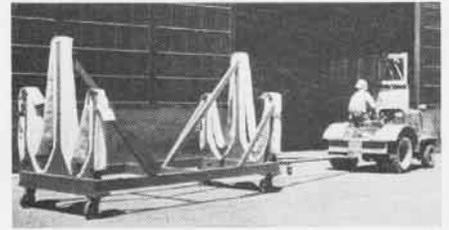
When at operating base, the kit is stored in the gunnery locker, the ordnance member of the crew being responsible for checking it in and out. The kit is sealed and except for emergency is opened only once a month for cleaning.

► **BuORD COMMENT**—This kit looks very good from a standpoint of storing arms when at base, but not from the point of men going into combat unarmed. Upon leaving the plane at base this would be very good for storing the arms until the next operation.

## Dolly Moves All Surfaces

### New Device Is Self-Adjusting

NAS, PEARL HARBOR—The problem of moving various sizes of airplane surfaces was solved here by a device devel-



AIRPLANE WINGS SWING IN CANVAS "HAMMOCK"

oped by an enlisted man. The rapid change in models of aircraft necessitated adoption of some method by which new designs could be handled upon receipt.

The old method of cutting out individual dollies did not prove practicable in view of the necessity of reshaping dollies with each new design received. Further, necessary information as to exact contours of the surface to permit advance cutting was not on hand.

The picture shows the method of construction that permits ready adjustment to conform to size of any surface to be handled. The webbing adjusts itself to fit contours of the surface inserted and can be made snug by use of pads on each side of the framework.

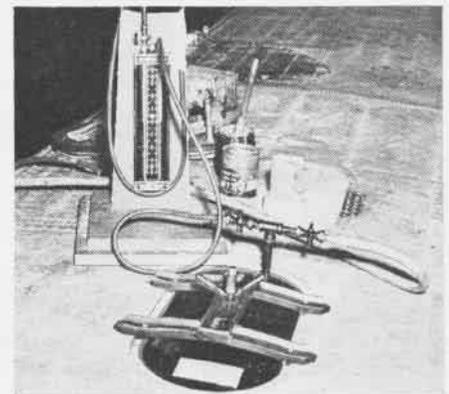
[DESIGNED BY E. W. MAPLES, AM2c, USN]

## PBY Test Cover Developed

### Reduces Time of Installation

NATC, CORPUS CHRISTI—A new test cover designed at this station for PBY fuel tank manholes reduces installation and removal time in leak test operations from 4 hours to only 20 minutes. Approximately 200 to 250 man-hours are gained here each month on the basis of 12 PBY fuel tanks tested monthly.

Permanent covers provided for PBY fuel tanks, held in place by 50 screws, must be coated with zinc chromate for



CORPUS INTRODUCES NEW LABOR SAVING DEVICE

## Correction

THE ADVICE given on page 7, paragraph 3, of *Dunking Sense*® that Lockheed Hudson PV-1, PV-2, PV-3, PBO-1, and R50 series airplanes should be ditched with flaps up now has been determined to be incorrect. This paragraph should be corrected in all copies now in use to require all landplanes to ditch with flaps fully extended. Service bulletins are being issued on the above models referring to *Dunking Sense* and advising this paragraph is in error. NANews has been asked to publish.

\* "Extend the flaps fully and land with flaps down in all types except the Lockheed Hudson and its associated models, PV-1, PV-2, PV-3, PBO-1, and R50 series. These should be landed with flaps up. . . ."

each installation. Following repairs, it was necessary to install cover in preparation for leak tests. New test cover effects the time gain in this operation. Heretofore, covers frequently were removed as many as six times before all leaks were located and stopped.

A sponge rubber gasket on the underside of new test cover provides a tight seal when the device is secured. Zinc chromate paste is not required



FUEL TANK COVER SIMPLIFIES TEST OPERATION

until leaks are repaired and tank is ready for installation of permanent cover.

[DESIGNED BY JOHN M. GERULATT]

## Photo Technical Bulletins

### Help Torpedo Camera Troubles

DESIGNED AS AN AID to aircraft torpedo camera trouble shooting, three Photographic Technical Bulletins have been issued by BuAer during 1943 and should be on file in all photographic laboratories. By following instructions contained in these bulletins, VTB squadrons can get good pictures with the F-46 Torpedo Camera to serve as an aid in training as well as produce photographic combat information.

The first of these Technical Bulletins, No. 22-32, issued March 10, deals with a general description, installation and operation of the torpedo camera. Maintenance information was stressed



NOW, NOW, HARRIGAN — IS THAT THE PRESCRIBED METHOD FOR PATCHING BULLET HOLES ?



DESPITE HAVING LEFT WING LOW, PILOT MAKING THIS PRACTICE TORPEDO RUN SCORED DIRECT HIT

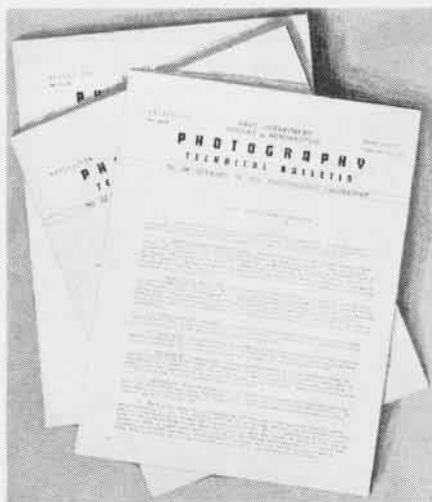
in TB NavAer 10-1R-37 issued September 27, while a change in wiring is explained in NavAer 10-1R-42 of November 20.

The purpose of the F-46 torpedo camera, according to the first bulletin, is to determine the result of a genuine or practice aerial torpedo attack. The camera, which is a British design, is attached to torpedo-carrying aircraft and bore-sighted with the aircraft's line of flight. The camera is electrically operated and connected to the torpedo release circuit so that an exposure is made at the time of real or simulated torpedo release.

The resulting photograph, 2" x 7" in size, shows the target ship, and when analyzed with assessing equipment, yields information on flight attitude of the aircraft at time of torpedo drop, range, lead angle, target angle, and whether or not a hit has been scored.

### Bugs Have Been Ironed Out of Items

Trouble with this equipment has been reported at various times and every attempt made to cure these ailments in production as they appeared. This camera, manufactured in U. S.

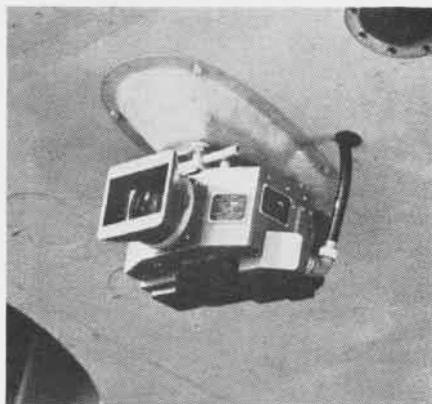


PHOTOGRAPHIC BULLETINS STRESS PROPER CARE

from British plans, was sent directly to training and fleet units without waiting for extended operational tests, in order to save time. There were "bugs" which had to be ironed out of the first production items but late reports indicate that

cameras now produced operate satisfactorily provided they are accorded the care and respect due delicate equipment of this nature.

Early film for this camera (identified by lap splices) was unsatisfactory as it occasionally jammed. This film was called in and replaced by film joined to its leader and trailer by an aerial film splice (butt-spliced and double taped with cellulose tape). Any of the early film remaining in stock should be re-



TORPEDO CAMERA RECORDS ACCURACY OF PILOT

turned for the newer variety. Amateur roll film No. 120 or 620 is NOT suitable for this camera. The correct article will be found on standard photographic stock lists as 18-F-39348.

### Users Must Pull Together for Results

Effective use of equipment requires close collaboration between ordnance and photographic personnel in order that pilots may have the benefit of prompt assessment of negatives. A pilot needs to know his results immediately while the attack is still fresh in his mind.

"Photographic quality" is unnecessary, for all that is required is a measurable image on the negative. Rapid development may be carried out in any form of tank, tray or bucket. To save time, negatives may be assessed wet after limited fixing and a quick incomplete wash. Careful development and making of prints is only in order when photographs are desired for combat information. Proper care of equipment will insure uniformly good results.

# BLIMP RESCUE

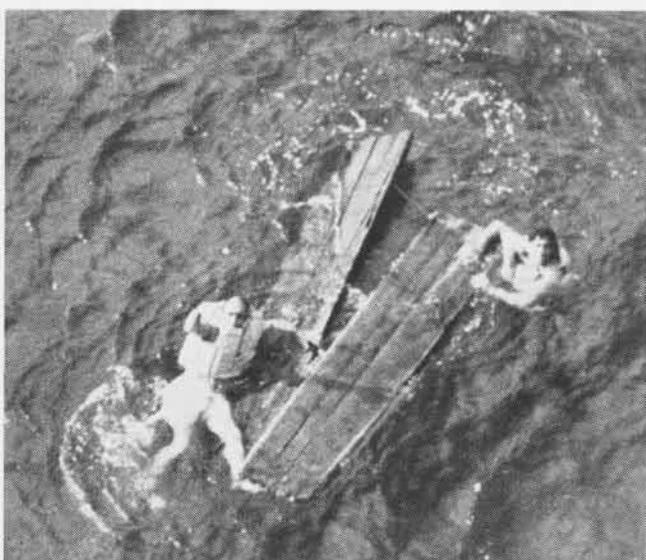
**T**WO WOODEN PLANKS, a couple of frail rafts and a capsized lifeboat supported 18 survivors of the Cuban freighter *Libertad* for more than 36 hours until the men were located by three Navy blimps and surface craft were directed to the rescue. The *Libertad* was lost, following two underwater explosions, off the North Carolina coast. Blimps were dispatched to the rescue the following day and located the 18 survivors, standing by and giving what aid they could until surface vessels could be directed to the area. Each airship located a different group of the drifting victims, dropping rafts and emergency rations, radioing positions and circling overhead until surface craft completed the rescues. The last of the *Libertad* survivors were picked up after having been afloat in the Atlantic for over 36 hours.



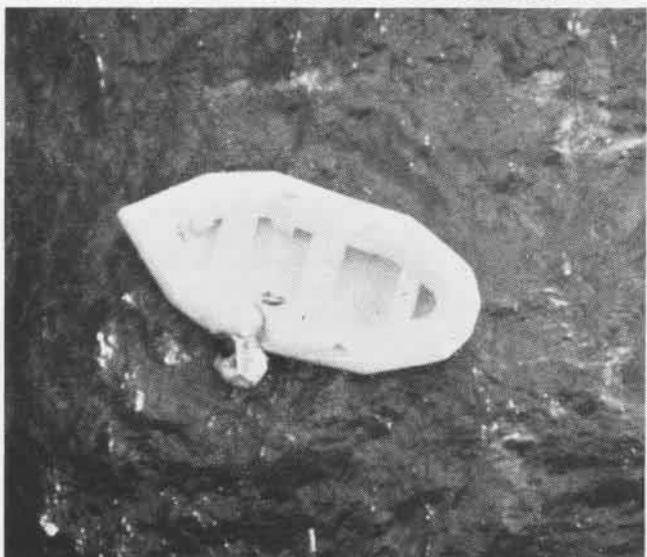
**BLIMP** contacts surface craft and guides it to rescue scene while other airships search seas for survivors of freighter



**ADRIFT** on life rafts, twelve men are sighted and the blimp hovers overhead until rescue vessel has them safely aboard



**EXHAUSTED** from 36 hours in the icy water, blimp locates two survivors clinging to bits of wreckage from the *Libertad*



**RUBBER** raft and emergency rations are dropped from airship and victims climb aboard to wait as blimp radios position



**LAUNCH** picks up survivors and tows life raft back to rescue vessel. Eighteen men were located and saved in two-day hunt

## Improvise Training Device Recognition Aid Simple to Make

NAS, PENSACOLA—A novel ship recognition training device has been improvised by a VOS squadron at this station which would be particularly



PROJECT PAPER MODELS IN LIGHTED DOORWAY

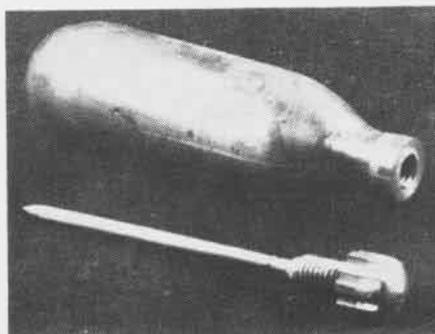
adaptable for use at advanced bases or on board ship where a minimum of equipment is available.

Shadow silhouettes of ship models or paper cut-outs are cast against a screen of translucent material fastened in a frame or on the window glass in a door. Direct comparison between ships is made by showing a number of different models simultaneously.

## Pistol Oiler for Holster

**BuOrd States It Is a Good Idea**

A pilot's life may be saved by a well-oiled pistol, but keeping them from rusting has been a difficult problem for fliers forced to make water landings near enemy territory. To meet this situation, an oiler small enough to be



SPENT CO<sub>2</sub> CONTAINER BECOMES HANDY OILER

carried in the pilot's shoulder holster has been devised.

Spent CO<sub>2</sub> bottles of the type used in life jackets are the raw materials utilized. Charging cap is removed from the bottle and a nut brazed to neck of bottle. Another nut is screwed to the

head of a flister-head screw, then brazed to form a screw-stopper.

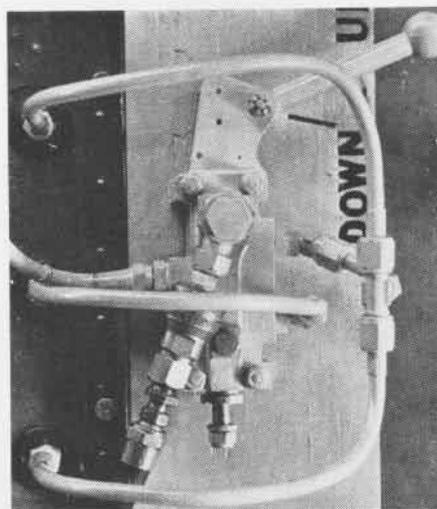
To the stopper is soldered a piece of wire 1 1/4" long, .030" in diameter, to give point-oiling to parts of the pistol hard to reach otherwise. All parts are turned on the lathe, polished and painted. Paper washer makes it leakproof.

[DESIGNED BY SGT. GEORGE S. HANSEN, SGT. WILLIAM J. OSAK AND CORP. H. S. PURDY, USMC]

► **BuORD COMMENT**—Good idea and fills an essential need. Should work well with waterproof cover designed by BuOrd.

## Flap System Saves Hours Rigging Can Be One-Man Job

NAS, CORPUS CHRISTI—A two-way, air-operated valve, used to raise and lower SNJ-4 landing flaps while being rigged on wings and center sections, has been developed here. Formerly, flaps were rigged in final assembly, a job requiring two men, one to sit in



VALVE ELIMINATES SERVICES OF ONE PERSON

cockpit and operate flaps manually, and the other to rig them.

New valve also eliminates danger of person rigging flaps being caught and injured because of a misunderstood signal. Device saves an average of four hours on each plane.

[DEVELOPED BY FRED E. ENGELKING]

► **BuAER COMMENT**—Although this is a good system for saving man-hours, it has its drawbacks in that it can be used only when oil has been drained from the hydraulic system. Otherwise, air is forced into the lines and bleeding becomes necessary. The valve should be quite effective in final assembly operations.

### ANSWERS TO INSTRUMENTS QUIZ on inside back cover

1.2 2.2 3.2 4.1 5.4 6.3

Visual quizzer films are available from BuAer's Special Devices Division. Standard slide film versions may be obtained from Training Films.

## REPRINT

Few of us are wise enough to prepare today, to the best of our ability, for what may happen tomorrow. But in warfare, and particularly in flying, the penalties are heavy for those who fail to do so.

Too many planes are being lost, too many submarines are getting away unscathed, because the pilots, or other members of the air crews, have not prepared themselves thoroughly for the conditions to be encountered. These conditions may include the defensive or evasive tactics of the enemy, weather, navigation, the proper use of the armament available, communications, and other factors affecting the situation.

There are entirely too many needless flying accidents. Frequently take stock of yourself and your qualifications to do your job perfectly. Plan your flight prior to take-off. Try to visualize all the situations that may arise and then judge your own fitness to cope, promptly and surely, with each. If you find yourself uncertain or unequipped, recognize the deficiency candidly, and set about remedying it.

### Opportunity Knocks But Once!

**BE PERSONALLY PREPARED!** As I have said before, the opportunity to sink an enemy submarine may come but once in a lifetime. Don't fumble it because you are not ready to act immediately and with maximum effectiveness. **THINK** until it is time to act—then stop thinking—**ACT**.

Don't take the lazy way, saying, "It can't happen to me," or "I'll take care of the situation when it arises." Don't learn the hard way by trial and error. Almost all the possible mistakes have already been made often enough. Be wise enough to profit by the experience of others and save your own hide, reputation, and equipment. In this connection the "Grampaw Pettibone" section of *NANews* is particularly recommended to pilots.

Physical fitness is far more than a mere strengthening of the muscles, particularly for flying personnel. When you are physically fit your faculties are keener, your reactions are quicker, your thinking is clearer, your coordination is better, and your endurance is greater. Lack of exercise, insufficient sleep, overindulgence in alcohol, dissipation, and infections impair the physical condition.

We are fighting a hard, ruthless, and resourceful enemy; we must make ourselves in all respects more efficient than he is. It takes a long while to get fit; when you are, **STAY FIT**. Should circumstances arise in which endurance and stamina are vital, it will be too late to cultivate your physical fitness.

When on a specific mission of whatever nature, whether training or combat, in the air or on the ground, give thought to the circumstances, visualize the situations that may arise, and prepare for them. **EXERCISE FORESIGHT!**

—Letter to Air Force Atlantic Fleet

# LETTERS

Sirs:

The Honorable Ralph A. Bard, Assistant Secretary of the Navy, dedicated the new A&R buildings here which he described as "the most modern Assembly and Repair shop in any naval establishment within

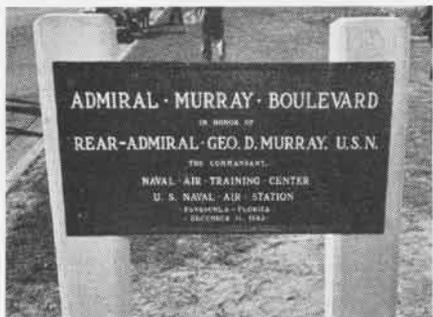


or outside the continental limits of the United States." He is shown in the accompanying photo speaking before several thousand Marines and civilians in the new hangar of the Aircraft Overhaul Building.

COMMANDING OFFICER  
MCAS, Cherry Point

Sirs:

A new four-lane highway connecting the City of Pensacola and the Naval Air Station was formally dedicated as the "Admiral Murray Boulevard" on December 11, in honor of Rear Admiral G. D. Murray, USN, Chief of NATC and commandant of the Pensacola training center.



Governors Spessard Holland of Florida and Chauncey Sparks of Alabama and U. S. Senator Claude Pepper of Florida were among the dignitaries who attended the ceremony when a plaque bearing the admiral's name was unveiled.

NATC, PENSACOLA

Sirs:

The synthetic gunnery training school here claims the "pistol packinest mama" in the Navy is WAVE Geraldine Uran, S2/c, of Excelsior, Minn. Uran shot a record

**BEST ANSWERS**  
to questions on page 8  
1.d 2.b 3.d 4.d 5.a 6.b

score (for WAVES) of 233 points out of a possible 245 in .22 caliber pistol competition, and also gave most of the men at the gunnery range something to shoot at. Competitors shot 49 rounds each with a maximum value of five points per round.

COMMANDANT  
NATC, Pensacola

Sirs:

A blood relation of the Naval Academy Angora, Gilbert was recently "logged in" and is being photographed for identification before being assigned official mascot of the aviation cadet regiment at the Naval Air Training Center. He immediately took his place of honor with the winning bat-



talion in the regiment's monthly dress parade.

PUBLIC RELATIONS OFFICER  
Naval Air Training Center  
Corpus Christi

Sirs:

My son is a U. S. Marine serving with the First Marine Air Wing and has asked me to request from your office a copy of NAVAL AVIATION NEWS dated October 15, 1943. Enclosed is 25c. Thank you.

THOMAS J. C.  
Pawtucket, R. I.

[As NAVAL AVIATION NEWS is restricted, copies are not distributed to the public. NANews sent copy to Marine C. at his present station and returned the 25c coin to his father with explanation. Ed.]

Sirs:

This will acknowledge receipt of copies of NANews of November 15, 1943, containing the aviation supply story. Thanks very much for forwarding them. I really believe that getting this information around in the field will be of real value.

LIEUT. SC-V (S), USNR  
Aviation Supply Office  
Philadelphia

Sirs:

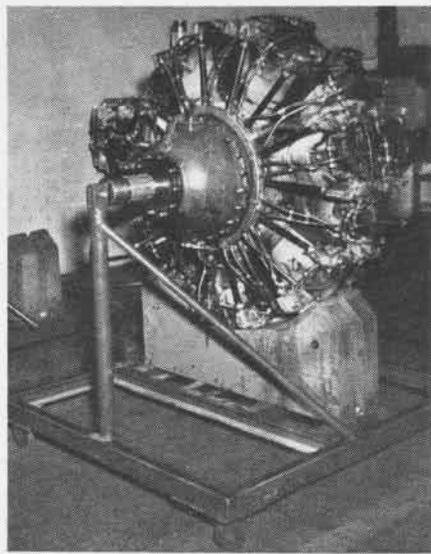
Will you consider placing my name on the mailing list for NANews? I am receiving specialist training here at the Advance Base Aviation Training Unit, so I would appreciate it very much to receive this magazine as I'm immensely interested in Naval Aviation.

MARTIN N., AMM2/c  
NAS, Norfolk

¶ Sorry, but it is not the policy of NANews to address copies to individuals. NAS, Norfolk, receives a regular quota of copies which should be sufficient for the needs there. If not, the distribution officer should request additional copies.

## New Cradle-Type Engine Stand Drawings Are Available

NATC, PENSACOLA—A new cradle-type engine stand is in use at A&R Department at this center, capable of receiving and holding an 1830-92 engine in a horizontal position. This affords accessibility to, and an unobstructed view of, the mounting ring-bolt holes,



CRADLE-TYPE ENGINE STAND IS HANDY DEVICE

the entire rear section and accessories. Drawings are available at the plant section of the A&R Department.



.... AND THIS IS OUR READY ROOM, WHERE ALL THE PILOTS ARE RARING TO GO AT A MOMENTS—OH, EXCUSE ME, FELLOWS!

**PIX QUIZ**

WHAT DO YOU KNOW ABOUT

# FLIGHT INSTRUMENTS?

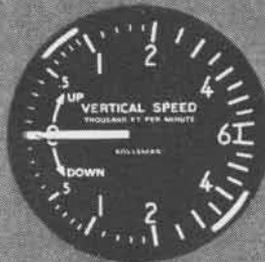
**T**HE MORE a pilot knows about his instrument panel, the more confidence, precision, and safety he shows in flying. In clear weather, flight instruments are not essential, but with decreasing visibility and lowering ceiling the need for them becomes increasingly greater. When a view of the ground is cut off, the pilot is absolutely dependent on his instruments. Test yourself on this instruments quiz and then see answers on page 39.

This instrument registers:



- |                      |                      |
|----------------------|----------------------|
| 1. Rotor rpm         | 3. Absolute pressure |
| 2. Relative pressure | 4. Precession rate   |

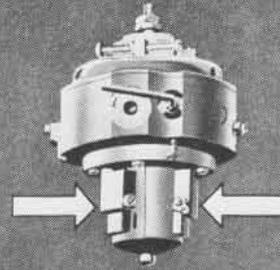
2 The instrument is operated by:



- |                          |                      |
|--------------------------|----------------------|
| 1. Barometric pressure   | 3. Wind pressure     |
| 2. Relative air pressure | 4. Terminal velocity |

3

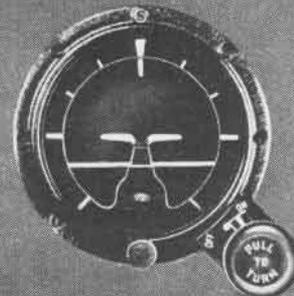
Arrows indicate the:



- |            |                   |
|------------|-------------------|
| 1. Dampers | 3. Counterweights |
| 2. Vanes   | 4. Compensators   |

4

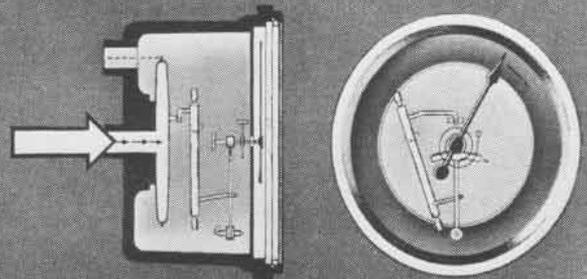
Plane's attitude is:



- |                       |                 |
|-----------------------|-----------------|
| 1. Climb, wings level | 3. Level flight |
| 2. Glide, wings level | 4. Nose low     |

5

Air enters here from the:



- |                |                  |
|----------------|------------------|
| 1. Static tube | 3. Impeller      |
| 2. Air scoop   | 4. Pressure tube |

6

Upon completion of the maneuver, the instrument will be level in about:



- |              |               |
|--------------|---------------|
| 1. 2 minutes | 3. One minute |
| 2. 5 minutes | 4. 30 seconds |

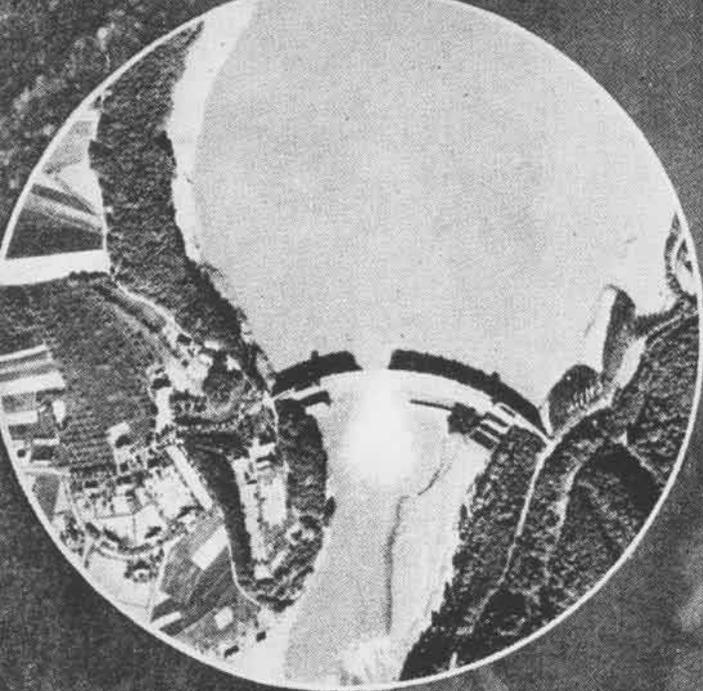
Write answers here

1. ....
2. ....
3. ....
4. ....
5. ....
6. ....



AVE, AVE, SIR!





# EDER DAM

**G**REAT IMPORTANCE the Germans attach to the Eder and Moehne Dams is indicated by recent photographic cover of these areas. Surprising progress with the repair work is shown since the dams were breached by RAF in May, 1943 (*see inset*). Gaps have been filled with reinforced concrete and both dams may be ready in time to save the water of the spring thaw for use in the late summer of 1944. Photographs on this page are of the Eder Dam. [British *Evidence in Camera*]

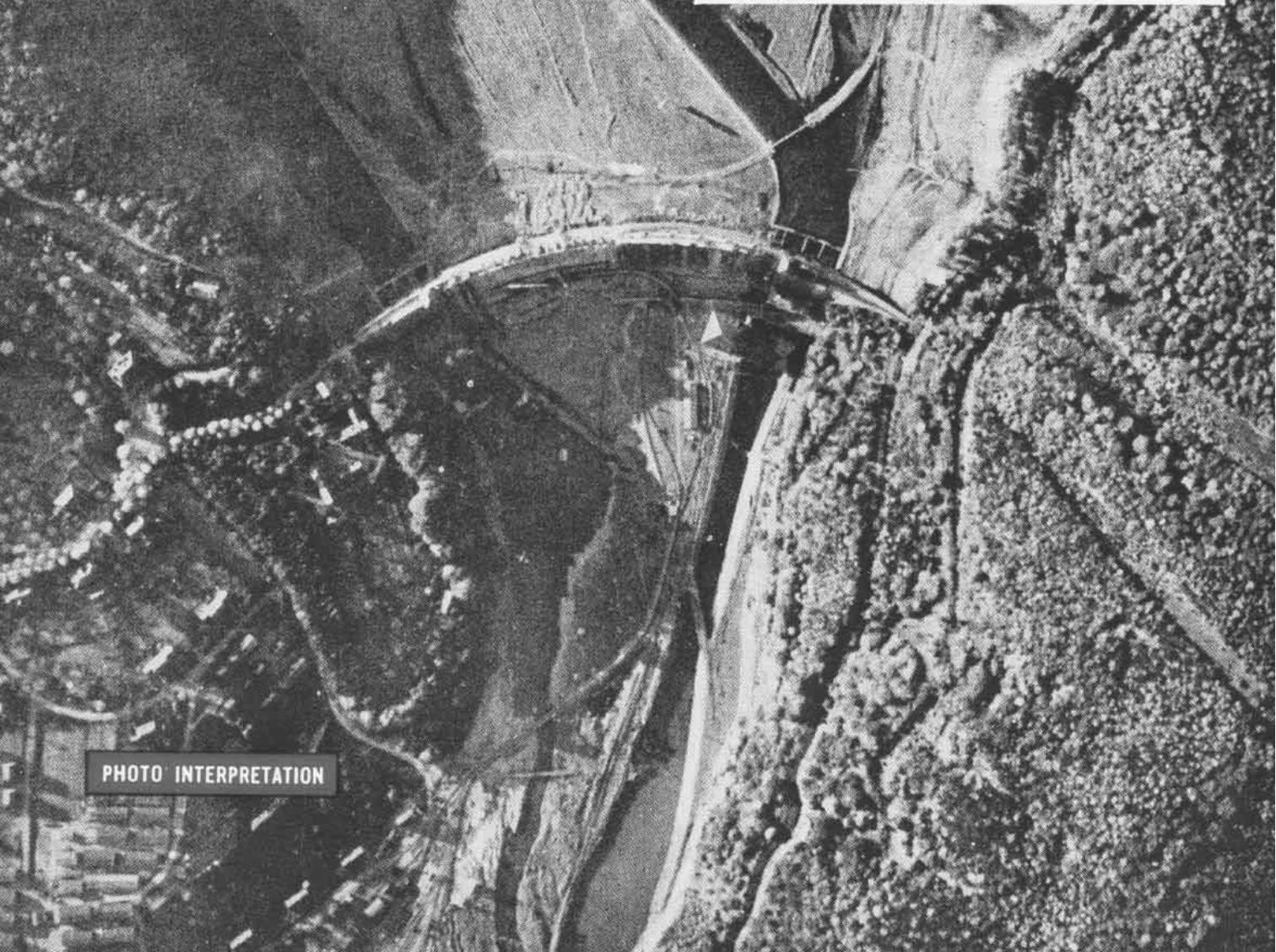


PHOTO INTERPRETATION