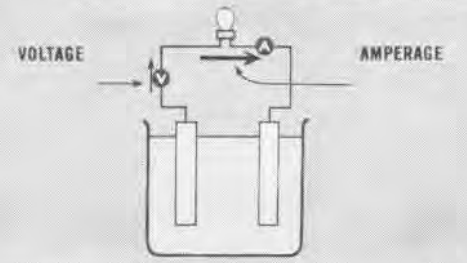
What do you know about BASIC ELECTRICITY?

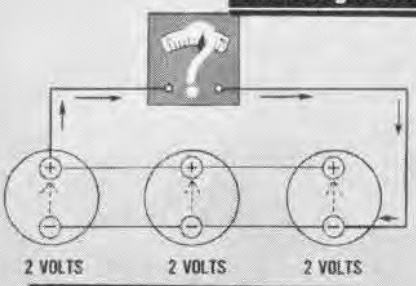
Consider this a refresher quiz if you're an old hand at electricity, and if you're new at the game, maybe you'll pick up a crumb or two about watts, amperes and volts. Regardless of your naval aviation background, NANews invites you to have a try, then see answers on p. 30.

1 The power consumed in watts equals —



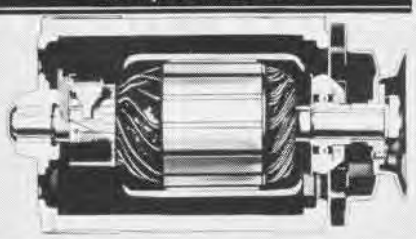
1. Volts + amperes
2. Volts ÷ amperes
3. Volts − amperes
4. Volts × amperes.

2 The voltage here is —.



1. 1½ volts
2. 6 volts
3. 8 volts
4. 2 volts.

3 When starting, the initial magnetic field usually comes from —



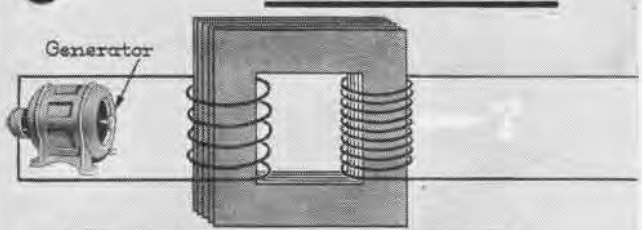
1. A primary cell
2. Residual magnetism
3. Auxiliary permanent magnets
4. Induced current.

4 A fully charged storage battery should give a reading of —

1. 1.150
2. 1.200
3. 1.300
4. 1.400
5. 1.475

5 Which will be affected by the tool kit?

6 The arrow points to the —



1. Primary of a step-down transformer
2. Secondary of a step-down transformer
3. Secondary of a step-up transformer
4. Primary of a step-up transformer.

Write your answers here

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

DANGER! UNEXPLODED BOMB!

Many Lives Are Saved by Bomb Disposal Crews Digging up Duds at Navy's Advanced Aerial Bases

•

CONTRARY to general opinion, bomb disposal is not a dangerous job—if it is done in the right way!

A Navy lieutenant and two Australian helpers were summoned recently to dig up three time bombs planted in a New Guinea airfield just captured from the Japs. The bomb disposal officer had no way of knowing how soon the deadly things were set to go off, but his job was to neutralize them so that the field could be used by Navy planes.

The three men chose the middle one of the three bombs and started to dig it up. While they were shoveling away the other two blew up, scattering debris and scrap iron over a wide area.

Bomb disposal officers, who are trained at a special school in Washington, put their claim in with the Marines and Seabees for the honor of being the first ashore when invasions land. As soon as the Navy takes over an airfield the disposal officer and his crew go over it with magnetic mine detectors or bayonets to locate duds and planted death traps.

Probably the worst things they have to deal with are the German "butterfly" bombs. They are slightly larger than grenades and are sown by the hundreds from Nazi planes. The bad part is that some have impact fuses, some time fuses and some anti-disturbance fuses which set off the bomb soon after a slight jar. The Germans spray these "butterflies" over the battle area from planes, dropping them from thin metal "container bombs" which burst and scatter the little units. These fall slowly, their yellow metal wings acting as drags.

TRAINED CREWS CLEAR AIR BASES TO PROTECT NAVY FLIERS, PLANES

ANOTHER odd but effective enemy bomb was used by the Japs at Guadalcanal. It consisted of a canvas bag filled with several handfuls of explosive, with four small magnets at the corners. Jap snipers would sneak through the jungle at night and slap the device on the underside of American planes and attach a string to some twig or peg. A pull on the string would set off the bomb.

The Japs and Germans always leave their abandoned airfields liberally strewn with booby traps, land mines and other choice items to delay the Navy's use of the fields, or at least make them tread gingerly to avoid being blown to bits. There usually are some of the Navy's own aerial bombs or unexploded shells from ship bombardments on these fields. These too have to be neutralized before bulldozers and work crews can repair the runways for plane operations.

The men who do this ticklish job know all the ways to neutralize explosives. Every aircraft carrier, battlewagon or cruiser carries its own bomb disposal officer and one or more is attached to all advanced naval air bases.

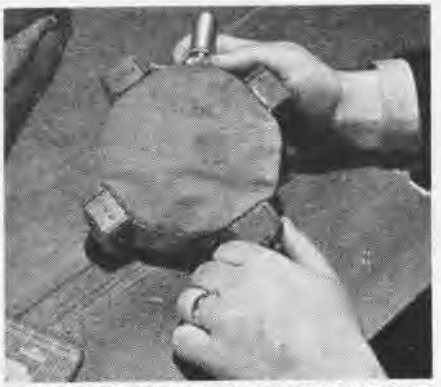
Their job, besides digging up the duds and enemy traps, is to analyze enemy ordnance and report any new bombs, explosives or methods used by him. Sometimes they do their work a long way from the front lines.

One bomb disposal crew was called out from the school in Washington to open a suspicious oblong box dredged up from the bed of the Potomac River. After carefully inspecting the box it was found to contain the cremated ashes of some character who apparently liked to fish in the river and wanted to be buried among the fish who got away.

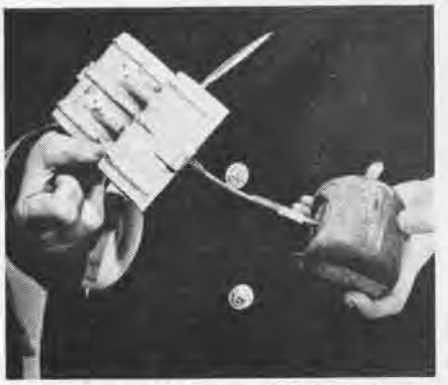
Not all jittery individuals are civilians either. An Army colonel on Guadalcanal routed the Navy bomb disposal officer out of bed at 3 a. m. to take care of a Jap bomb planted in his tent. It turned out to be a cake of soap. The colonel was not overcautious —sometimes cakes of soap are booby traps.

Booby traps all work about the same, whether Jap or German, about the only difference being the way the enemy rigs them to catch the unwary souvenir hunters or scouting patrols. To give the student officers training in rigging and dismantling such traps, the school has two groups rig them, then sends them out with flashlights at night to neutralize the other's tricks. Giant firecrackers let the rival crews know when they fail.

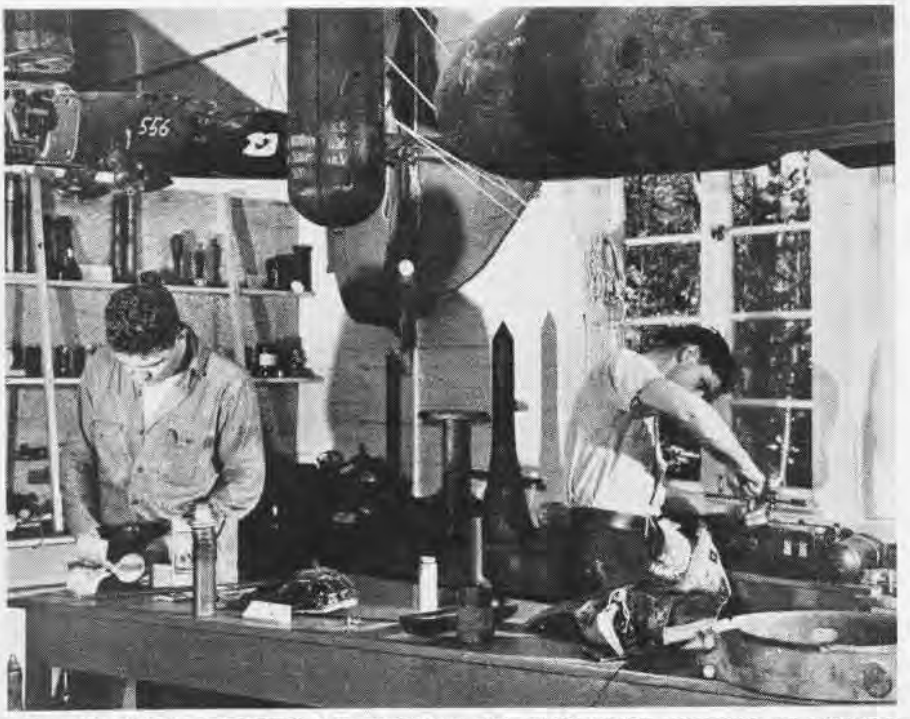
Approximately 80 officers and enlisted men are trained at the school at a time in four classes, receiving nine weeks of training in how to assemble and take apart all enemy and Allied aerial bombs, projectiles, small ordnance, depth bombs and booby traps. Fifty per cent of the graduates are assigned to naval aviation billets around the world from Italy to the South Pacific and Alaska. They return periodically for refresher courses at the school to learn new developments in ordnance.



JAP BOMB HELD TO PLANE BELLY BY MAGNETS



GERMAN BUTTERFLY BOMB SIMPLE BUT DEADLY



CAPTURED ENEMY BOMBSIGHTS AND ORDNANCE ARE TAKEN APART, ANALYZED BY STUDENTS

WHAT TO DO WITH UNEXPLODED BOMBS

1. Don't fool with them; resist the desire to pick up brightly colored souvenirs.
2. Don't try to take duds apart or to neutralize them yourself.
3. Don't move them from the place where they lie.
4. Don't cover them with dirt—the jar may set off an anti-disturbance fuse.
5. Don't use enemy equipment until sure no booby traps are attached and then only after learning the correct way to use it.

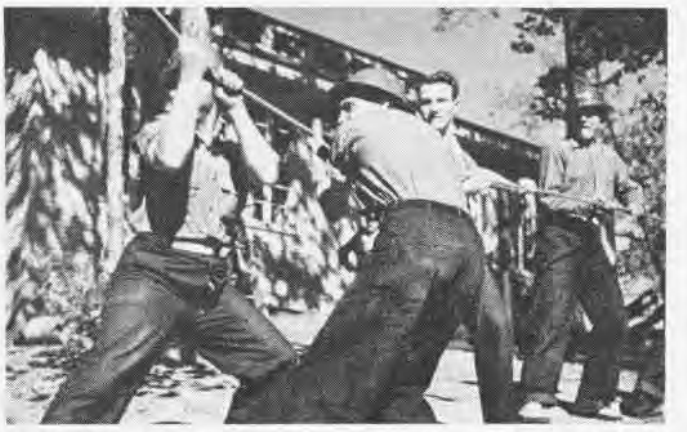
MARK ALL DUDS TO WARN PASSERSBY AND NOTIFY THE BOMB DISPOSAL OFFICER

BOMB DISPOSAL TAKES WORK, BRAINS

1 **DEEP SHAFT,** sometimes 35 feet down, needed to reach and neutralize dud projectiles or bombs

2 **STRONG TIMBERING** keeps shaft from caving in; crews use no nails in shoring up their pits

3 **UNEXPLODED BOMB** uncovered, officer and men of school prepare to neutralize prior to raising



4 **BLOCK AND** tackle, plus muscle, needed to raise 500-pound bomb to surface for expert analyzing

Enemy Ordnance Is Task for Expert Navy Officers

THE life of a bomb disposal officer is filled with exciting experiences—some of them humorous. One officer was detailed to explode a huge 3000-lb. German blockbuster bomb in Malta. He got down to it and found he had brought along only five minutes of fuse to use for setting it off. So he hired a native to park his car on the brink of the bomb pit with motor running, to drive him a long way off in a hurry when he lit the fuse.

The officer touched a match to his fuse, then scrambled up the pit to the car. He forgot the car had a right-hand drive and tried to get in on top of the driver. Unmindful of the burning fuse, the driver thought the officer wanted to drive so he climbed out, into the back seat. The officer finally, by frantic gestures, got the driver behind the wheel.

5 **CREW LEADER** tells his assistants intricacies of XPB (unexploded bomb) just taken from shaft; disposal men's job not dangerous with 'know how'

GRAMPAW PETTIBONE

Get 'em Snug

In reconstructing a fatal jump by a student pilot, the investigating board determined that it is possible for a jumper to fall out of an incorrectly adjusted parachute harness, if the shoulder risers are off the shoulder. This can easily happen if the harness is too large and the risers slip off the shoulders before the jump is made or before the ripcord is pulled.

GET A 'CHUTE THAT FITS YOU OR HAVE IT ADJUSTED SO THAT IT DOES!

All's Well That Ends Well

A student in Squadron VN12D8-B, NAAS, Cuddihy Field, was recently forced to cope with an emergency such as he may later have to face in actual combat. During a cross-under maneuver, from a stepdown Vee formation, his vertical stabilizer and rudder were struck and badly damaged.

The student was able to keep his plane in level flight, but he had very little rudder or aileron control. He immediately decided he had enough control to land and proceeded to do so, successfully. This action saved an expensive airplane and prevented possible injury to himself.

Grampaw Pettibone says:

Very good, but I would feel a lot better about this if the report had said that the pilot had thoroughly tested out his controls at altitude, as per existing instructions. A damaged airplane may fly straight at high speed and yet be uncontrollable at stalling speed or in a landing attitude. That is why pilots are directed to thoroughly test out the control of a damaged airplane at altitude, before attempting to land. If you lose control while making these thorough tests at altitude, it gives you a chance to bail out and come back and tell all about it.

[SEE TECHNICAL ORDER NO. 48-40]

Never Too Old or Too Simple

In submitting the following list of pilot-error accidents, Marine Base Defense Air Group 44 points out that the old and simple rules and lessons stressed in training are demonstrated over and over again in actual practice:

1. A pilot landing an F4U ran off the runway on to the gravel. There were no obstacles or ditches ahead, but the dust flurried the pilot and he slammed on both brakes. The plane slowly went over on its nose, badly smashed up, and the landing gear was curved like a pair of bow legs. *Moral*—Don't get excited; keep your toes lightly on the brakes.

2. Another F4U came in for a landing with full flaps in a fresh and veering wind. After the plane touched ground, a sudden gust ballooned it up about 25 feet into the air. The pilot decided to circle the field again, opened the throttle full, got immediate left torque, ended up pancaked neatly upside down, and managed to get himself out of the plane after it caught fire. *Moral*—Two obvious mistakes here; you list them.

3. In taking off, the pilot of an F4F noticed the left wing start to dip just as the wheels were leaving the ground. He gave her more gun and the Grumman veered left and smashed through a hangar, taking out a 12-inch-square wood post and making mince meat of two Cubs. *Moral*—The same mistake again, which this time cost three planes, besides scaring the daylights out of a mechanic working in that location.

4. A pilot was sent from El Centro to pick up another El Centro pilot who had overshot the Mojave field and cracked up. He put his plane down at Tonopah, sure that he was in Mojave, for a casual glance at his map showed a somewhat similar layout of mountains and dry lakes. He had only 15 gallons of gas left, but that had not worried him, for he had seen numerous possible landing fields, none of which he had bothered to identify. He had flown almost twice the El Centro-to-Mojave distance on a course 25 degrees in error. He even missed the right state, landing in Nevada instead of California, 165 miles from his destination. *Moral*—Compasses, radio beam signals, air speed dials, and estimated times of arrival can save a pilot embarrassing moments.

ATTENTION SQUADRON CO.s!

Does Each of Your Pilots Know

TECHNICAL ORDERS AND NOTES

Applying to Your EQUIPMENT?

Wrong Runway

Corpus Christi reports on a recent and, fortunately, not fatal accident which occurred during night flying at that center. While plane No. 1 was waiting to take off on runway No. 4, the runway in use, plane No. 2 took off on runway No. 13 and collided with the No. 1 plane at the intersection of the runways, just after being airborne. *Result:* Two planes chalked up for Tojo.

The Trouble Board's opinion was that the responsibility rested wholly with the pilot of the No. 2 plane in that he took off on other than the designated runway. The pilot of No. 2 plane (570 hours) had made two previous flights the same night from No. 4 runway.

Grampaw Pettibone says:

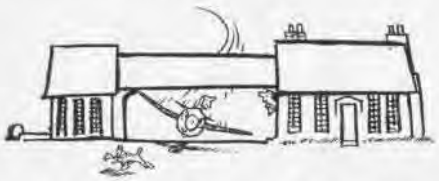
I can hear the chorus of pilots saying, "What a dumb cluck—imagine using the wrong runway!" That's what the pilot of the No. 2 plane would have said, too, before it happened. And it *will* happen to you the moment you start taking things for granted.

The Low Flying Problem

NAS, Hutchinson, Kansas, has taken a new approach to the problem. A recent press release requested residents within a radius of 50 miles to cooperate in a survey to determine whether strict Navy regulations against low flying were being violated. Anyone seeing a low flying plane was requested to notify the air station immediately in writing, giving the number of the plane and the exact time and location it was observed.

It was explained that the regulations at this station forbid flying at altitudes under 1,000 feet, and that acrobatics, while they are a definite part of Navy flight training, must be executed at al-

titudes above 4,000 feet. It was pointed out that if a plane is flying low enough for its numbers to be read accurately, it must be under 1,000 feet.



In forwarding a copy of this release to units of his command for information and guidance, Commander Naval Air Primary Training stated: "This publicity will go far toward winning public cooperation and otherwise helping to curb the evils of low flying."

Grampaw Pettibone says:

This sounds like a body blow to flat-hatting. Even out in the sticks, someone might spot you.

Nothing was said about simulated emergencies, but I presume these maneuvers are limited to certain prescribed areas.

This procedure may seem like strong medicine, but the large number of serious accidents which occur as a result of this type of flying justifies such action. Anyway, it will only affect those who refuse to obey flight regs.

It strikes me that this problem will never be brought under control at training stations without the full cooperation of *all* flight instructors. Instructors who are addicted to this dangerous pastime are the most serious offenders, not only because a good many of *them* come to grief in this manner, but mainly because the students will copy everything they do. Once the instructors see the light, they should soon be able to stamp it out among the students.

And I believe, if the seriousness of the problem is properly put up to the instructors, together with their important relation to it, that the bulk of the instructors will be willing to forgo even an occasional "fling" and will report any and *all* transgressors. This latter action is absolutely necessary because just one pilot, who considers himself above the law, can wreck the whole program.

To back up the instructors, nonconformists must be dealt with severely.

Landing Gear Check

Upon attempting to raise the landing gear of a PV-1 after take-off, the wheels stuck one-fourth of the way up. All attempts to move them either up or down failed. It was subsequently necessary to make a belly landing on the field which caused considerable damage to the airplane.

Investigation disclosed that the trouble with the landing gear occurred because the linkage between the landing gear "Up-Down" position handle and the four-way hydraulic control valve was not properly adjusted after the valve was replaced, following disassembly and bench test the night before the flight. Failure to make this adjustment caused the first movement of the "Up-Down" selector handle to turn the cam shaft in the four-way valve too far, shearing the soft aluminum cam stop. This released the triggers on all poppet valves, causing all of them to close. This locked the hydraulic system in all directions.

The Board recommended that each time any important repair or replacement is made in the landing gear hydraulic system that the airplane be jacked up and the landing gear be checked in both the "Up" and "Down" positions prior to flight.

***COMMENT*—This same recommendation should hold true after disassembly of *any* hydraulic actuating mechanism.**

A MILD EXAMPLE of what can happen if you get in slip stream of plane ahead of you in making your landing approach.

Graveyard Spiral

The greatest single danger to an inexperienced pilot flying *at night or on instruments* is the "graveyard spiral," a diving spiral which gets progressively tighter and steeper and is accompanied by a rapid loss of altitude, according to *Instrument Flight, Part I* (Basic Airwork).

Such a spiral results directly from the pilot relying too much on his sensations and too little on instruments which show whether the airplane is banking or turning.

The graveyard spiral starts by the airplane gradually entering a turn without the pilot realizing it. In such an involuntary turn, the angle of bank and the rate of turn both increase so slowly that the pilot has no sensation to tell him that the position of his airplane has changed. He retains the positive impression that it is still flying straight with the wings level.

Bear in mind that these remarks all refer to night or "instrument" weather; if the pilot could "see," he immediately would recognize the position of his airplane.

The pilot's first indication that anything is wrong is a change of noise, an increase in airspeed or a loss of altitude. Under these circumstances, unless the pilot looks at and believes the instruments which show that the plane is turning and banking, he will merely pull back on the stick, under the impression that he is recovering from a straight dive.

If he does so, this impression of being in a straight dive will be immediately heightened since pulling back on the stick gives him the feeling he would have in a normal straight pull-out.

Once he starts to pull back on the stick, the turn gets tighter, the nose drops lower, and there is a rapid increase in airspeed and rate of descent. After a few seconds, speed of the plane may have increased to more than double its original speed, and rate of descent may have increased to several thousand feet per minute. Fear and confusion accompanying this unexpected action prevent the inexperienced pilot from thinking rationally and from overcoming the fixed idea that he is in a straight dive.

The usual tendency is for him to pull back harder and harder on the stick in the blind hope that the plane will recover before it crashes.

Any pilot can easily and quickly recover from such a spiral. Remember—when anything seems to be wrong, when the airplane is starting to lose altitude and gain speed, *first look at the instruments that show whether the plane is banking and turning.*

In all probability the plane is banked and is turning although your sensations make you feel it is in straight flight with wings level. Fight any tendency to act according to your sensations. Make yourself stop the turn by leveling the wings. Then, and only then, use the stick to stop the dive.

[Note: Additional comments on the physical and psychological reactions of pilots when flying in instrument weather conditions will be found in the article *Vertigo*, BuAer T.N. 61-42.]

Jammed Controls

Several cases of jammed controls in SBD-5's have been reported. They have been caused by foreign articles lodging between the central control torque tube assembly (Part No. 3090186) and the cockpit deck.

Units operating this airplane should keep after cockpit curtains installed at all times and should make thorough pre-flight inspections for loose articles.

Grampaw Pettibone says:

This advice about inspecting for loose articles is mighty sound for all airplanes. Things that are easy to remove on the ground are impossible to get at in the air, and no one is more helpless than an aviator with jammed flight controls.

Use Your Bean

While making an approach on the designated runway, an FM-1 pilot (600 hours) noticed that he was drifting considerably in a strong crosswind. He elected to continue the landing, however, and groundlooped violently, sending the airplane to A&R for a major overhaul.

The Trouble Board said: "All pilots in this squadron have again been cautioned that good judgment normally

dictates a wave-off when a strong crosswind is noticed in an approach to a landing, regardless of the landing course designated by the field control tower. Also, proper technique has been stressed in making a crosswind landing."

You Can Lead a Horse to Water

Numerous remarks, such as the following, appear on reports of aircraft accidents:

a. "The pilot's injuries would have been negligible had he worn the shoulder harness which was installed in this airplane."

b. "It is believed that this accident would not have resulted in death if the pilot had been wearing his shoulder harness."

Grampaw Pettibone says:

This stumps me! Apparently there is something in the mentality of the pilots who neglect to wear their shoulder harness which causes a large proportion of them to have accidents (doubtless they are also lax about other important flight requirements). Too bad this type can't be weeded out before flight training is started; screening them out by actual crashes seems like a crude, old-fashioned way of weeding them.

Or maybe you don't wear your shoulder harness because of false pride and a superior attitude—"I'm too good; it can't happen to me." Get humble, son; it is happening to better men than you are, every day. Be modern, keep up with the times. You wear a parachute and a safety belt; the shoulder harness is merely the latest life-saving device along these lines.

And don't be an ass and cling to the fatalistic idea, "if it's my turn, I'm going to get it, anyway." Aviation is no place for a fatalist. Fatalists are careless—and you know what that gets you in aviation. Flying is a science, governed by the laws of cause and effect. Only they should be in aviation who are aware of this; who fully realize its dangers and intelligently set about forestalling them by every possible means; who intimately know their planes—their possibilities—and also their limitations.

To come back to shoulder harnesses, they were designed solely because most people who cracked up were injured only around the head and face. And the shoulder harness *does* stop these injuries, by keeping the upper body from snapping forward—ask the guy who has worn one in a crash. People who wear them are getting up and walking away from accidents that used to be fatal.

DON'T GET CAUGHT WITH YOUR SHOULDER HARNESS DOWN!

Bailing-Out Difficulties

"Realizing that I had to get out quickly, I rolled the tab to get a little more altitude and got rid of the cockpit cover by the emergency release. I was 1,500 feet when I released my safety belt and rolled over the ship. I placed my left hand on the rip cord ring as I started out of the cockpit. But as I let go of the controls my nose dropped. (Mistake No. *1:* I had not rolled the tab forward.)

"When the nose dropped, I was slammed back into the cockpit. My left hand jerked the rip cord ring loose from the holder. (Mistake No. *2:* I should not have had my hand anywhere near the ring.) I was afraid I had opened the chute, so grabbed the stick and slapped it forward, catapulting me into the air. I was then at about 1,000 feet. I reached across with my right hand and jerked the dangling ring. The chute opened at once.

"I was traveling about 180-200 knots and about 800 feet when the chute opened. The jerk blacked me out momentarily. When I came to, I immediately slipped back into the risers and when a couple hundred feet above the water I unbuckled the straps. I had no sooner done this than my feet hit the water. I dumped the chute and swam clear of the canopy.

"I pulled the co2 rings on my Mae West, but it immediately deflated. My Mae West had been punctured from the AA, though I did not notice any

ack-ack in the cockpit. I tried to inflate my life raft, but had difficulty in finding the co bottle. When I did, I could not find the pin, or turn the handle. (Mistake No. *3:* I had never inflated the raft before.)"

Grampaw Pettibone says:

Are you as unfamiliar with some of the problems of bailing-out as this Marine fighter pilot (F4U) was? Circumstances beyond your control may force you to jump on your next hop. For this reason, you should have in your bag of tricks the proper *know-how* for using this and all other life-saving equipment. If you are not absolutely certain how to use any of this equipment, make it a point to rectify this deficiency before your next flight.

Squadron commanders bear an added responsibility for their entire squadron on these matters. If you don't already have one, I recommend the appointment of a squadron safety officer; a darned good one. There is plenty to do in looking after all safety equipment and insuring that personnel are fully trained in upkeep, handling, and use thereof, to make this practically a full-time job for an energetic and capable officer.

Lost Suction on Take-Off

The engine of an SB2C-1 cut out immediately after take-off during night field-carrier-landing practice. A fatal crash resulted. Subsequent investigation indicated that the pilot (1,016 hours) had flown the entire period (approximately one hour) on the fuselage tank and had exhausted the gas in this tank during his last take-off.

Service Bulletin No. 6 on this airplane and No. 4 on the SB2C-2 recommend that fuel in the fuselage tank be used during the early part of each flight, in order: *1.* to improve balance, and *2.* to use up the fuel in the nonleakproof tank first.

Grampaw Pettibone says:

It is impossible to issue directives covering every eventuality. That is why I keep harping on "common sense." It is one of the most necessary and valuable assets an aviator can have. The above bulletins never intended that the fuselage tank should be run dry at low altitude. Everyone knows how dangerous that is; even if you shift tanks immediately, you may not have enough altitude to regain suction.

Undoubtedly, this experienced aviator had no intention of running his tank dry. He just got so interested in his landings that he forgot to keep track of his gas consumption. Even in combat, pilots must remain *Fuel Conscious.* You must intermittently check your fuel consumption and keep the fuel picture in the back of your mind (not too far back), including exact movement of the fuel selector valve necessary to switch to a full tank.

STRIPPING and repairing .50 caliber machine guns, 20mm cannon and other aircraft armament is part of training

INSTALLING bomb fuses in the field and assigning them to a combat mission necessitates thorough understanding

JACKSONVILLE A.G.O. SCHOOL

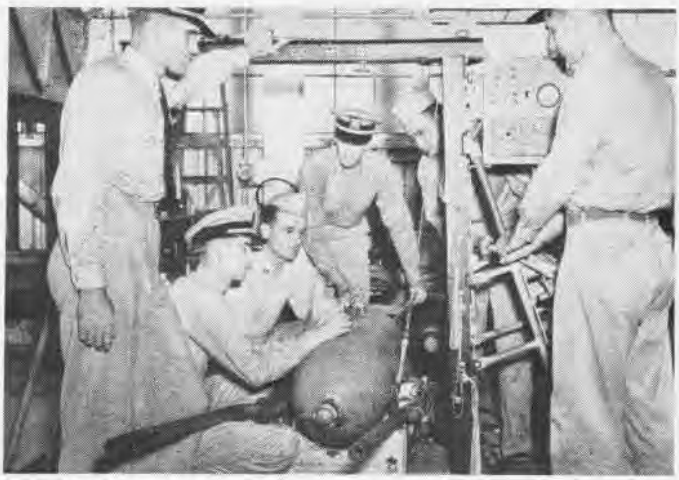
At the start of the war, the gunnery officer of every aviation squadron was one of the pilots. Besides his ordinary duties as a flier, he assumed the responsibility of overseeing for all the planes of his squadron, procurement, installation, and maintenance of guns, ammunition, bombing equipment and bombs. In whatever time was left, he clerked for the squadron, keeping its records and reports. Overworked, he called for help, and the answer was the Aviation Gunnery Officers' School at the Naval Air Technical Training Center in Jacksonville.

At the school, men are being groomed to take over the gunnery officer's duties. Most of the students are engineers, technicians and professional men drawn directly from civilian life; others are aviation cadets.

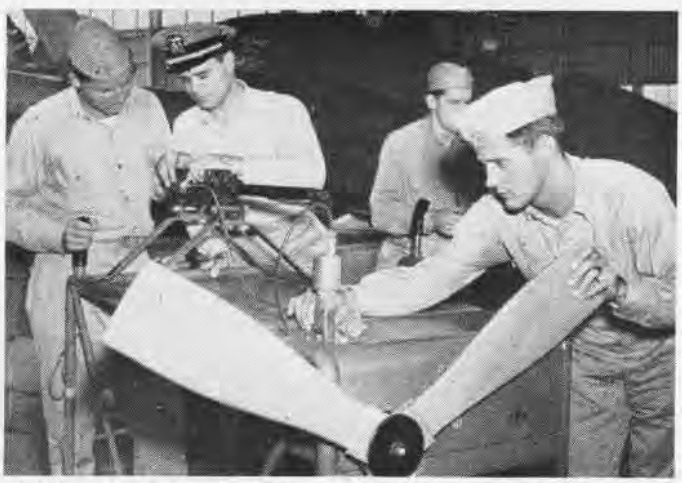
The course includes work in shops and classrooms. The men are taught to handle everything in aviation ordnance from the quarter-inch detent pin of a bomb fuse to the four-thousand-pound bombs themselves. They disassemble and assemble every type of gun mounted in airplanes, and learn to doctor their ailments. They study the mechanisms with which bombs are suspended and released. Then, having learned the use of material, they become familiar with the channels through which it is distributed to advance bases, ships, squadrons and planes.

Graduates are becoming nuclear officers in the aviation service units established by the Navy. Squadrons needing repairs or equipment are sent to these service units where guns are installed, recalcitrant bomb racks mended, intervalometers, bombsights and gun sights serviced—all under the deft supervision of the AGO's, the "fliers' garagemen."

Other graduates of the school travel with squadrons. They see to it that every plane's guns are ready for action within moments of landing. They supervise handling of bombs, fuses and pyrotechnic gear, procure equipment and manage all ordnance reports. In short, they take over the duties of the harried pilot who used to wonder how he could find time to fly and be gunnery officer all at once for an air squadron.



LOADING bombs in mock-up of bomb bay rack teaches the careful handling which is needed in actual combat



SYNCHRONIZING .30 caliber machine guns to fire through rotating blades of propeller requires utmost precision

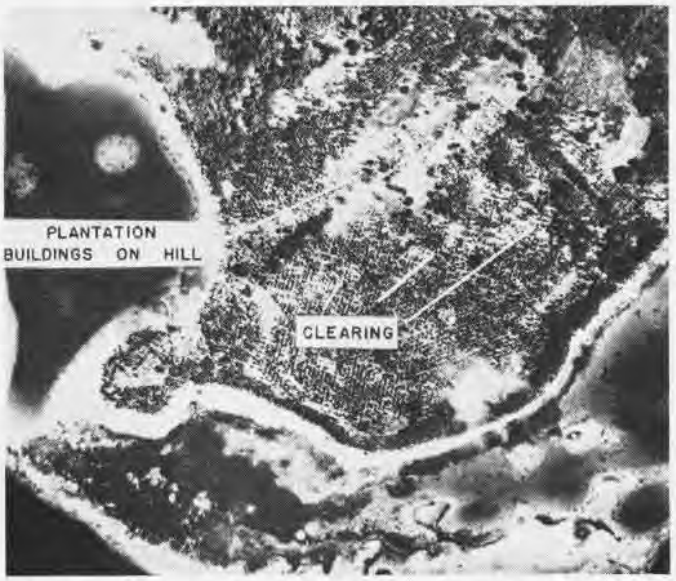
PRELUDE TO INVASION

A year ago the Japs were converting Munda's stately coconut grove into an airfield. Today Munda serves Allied planes that strike out at targets of Rising Sun

WHEN first viewed through the eyes of aerial cameras, Jap-held Munda Point was a peaceful coconut plantation of little importance. But when photos taken a few days later revealed patches of coral taking form under the trees, the interest of photo interpreters was whetted. Later, photographs revealed the definite pattern of an airfield.

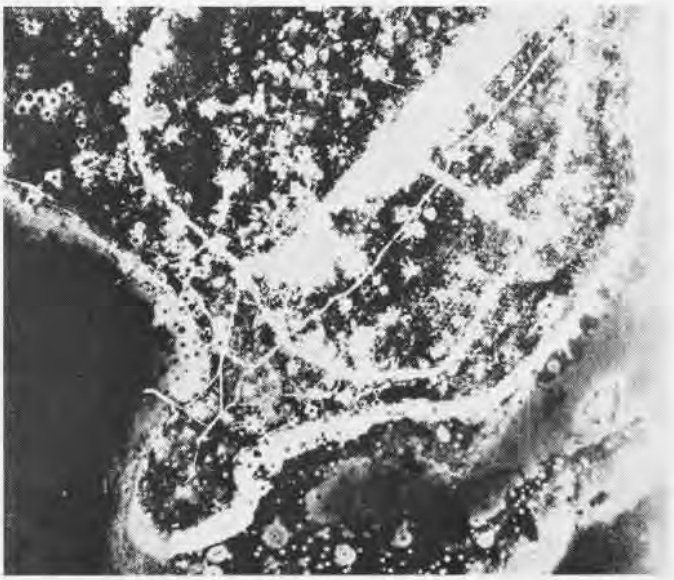
The Japs used natural camouflage to greatest advantage by leaving trees standing while preparing sections of the field runway, taxiways, shelters and installations.

NOV. 28 Early photos failed to show anything of strategic value at Munda Point



DEC. 5 Photo interpreters discover definite signs of airport being built under coconut trees

DEC. 9 Working under natural camouflage, field is practically complete with removal of trees



MAR. 30 Devastation following three months of raids causes Japs to abandon field

THIS carefully planned "surprise" proved a vain effort, thanks to the early penetration of American reconnaissance cameras that revealed what the enemy was up to. When the trees finally were cleared for action, photo interpreters already knew the secret.

Jap construction work continued until late in February, although the field had been in use since mid-December. During this entire period constant repairs, necessitated by aerial bombardments and salvos from our warships, were made on the runway and on other improvements built by Japanese construction crews.

On March 30, reconnaissance photos revealed that the coconut plantation airfield had been reduced to rubble by relentless U. S. bombing. The absence of any trace of enemy activity was mute evidence that continued blasting had made the base untenable.

Munda was invaded on August 3, and while hand-to-hand fighting continued in nearby jungles, the battle-torn landing strip was restored by Seabees in 46 hours, even though it was still being subjected to enemy artillery action. First fighter planes landed on the field on August 14. They were sent to cover Allied invasion of Vella Lavella Island, scheduled for the next day. Munda airport went into operation as an Allied base at dawn Sunday, August 15, exactly ten days afterwards.

⬆ Seabees, using coral for surfacing, started rebuilding bomb-blasted field after capture August 5
⬇ Nine days later Marine pilot landed *Corsair* on strip and Munda Point became advanced Allied base

DID YOU KNOW?

VR's Lead in Utilization

Close to Commercial Records

Aircraft of the Naval Air Transport Service are gathering little rust these days, the heavy demands of passenger and freight traffic keeping them flying much of the time.

The leading landplane squadron VR-7 during August reported a daily utilization for its R4D type transports of 7.75 hours. For the same month VR-2 was the leading flying boat squadron, with a utilization of 7.1 hours a day for its PB2Y-3R planes. Both these totals represent substantial advances over the past few months.

Records of other landplanes and flying boat squadrons also are improving and follow closely behind the two leaders, NATS reports. Because military requirements call for many special flights and off-schedule runs, squadrons ordinarily might be expected to operate below the normal utilization levels of regular commercial airline carriers.

Taught to Save All Scrap

Station Officers Avoid Waste

NAS, JACKSONVILLE—A scrap-saving system was taught conservation officers at the air station here in a short course attended by personnel from every station under the Naval Air Operational Training Command.

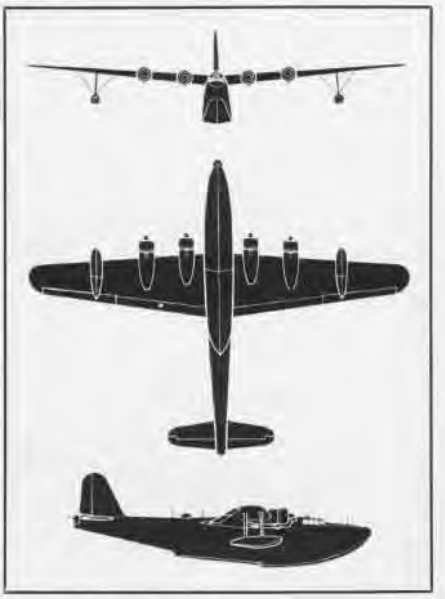
It is the duty of conservation officers at all air stations under the command to see that time, effort, and material are handled without waste. The three-day course was given to representatives of all air stations whose duty it is to see that nothing is being left undone to aid progress of the war effort.

Identify Jap Flying Boat

Largest Type Has Tapered Wing

Additional information on the new 4-engine Japanese flying boat, first photographed in July and August, now classifies it as Emily type 2 PB. [See back cover NANEWS, Oct. 1, 1943.]

Originally believed to have a slight gull wing tendency, recognition now reveals it has a high wing with marked taper from the roots.



Other distinguishing features show the trailing edge of wing tips curve sharply to small rounded point. The deep hull has a long nose tapering forward from leading edge of wing with large high bell-shaped fin and rudder. Tail plane has tapered edges and rounded tips.

Known by the code name Emily, this flying boat is one of the largest planes in the Japanese naval air forces, having an approximate wing span of 118' and length of 90'. Reconnaissance planes have spotted this type on several missions over Jap-held islands in the Southwest Pacific, indicating that it is operational in limited numbers and will possibly be seen more frequently in the future.

NEW GERMAN SUBMARINE PACKS sent into Atlantic convoy lanes are equipped with heavier anti-aircraft to meet the challenge of Navy planes now escorting ships. Evidence of this was shown in a recent photograph of a Nazi U-boat trapped and sunk by American naval units while in a refueling operation.

Analysis of the photograph showed the U-boat mounted what appeared to be twin 40-mm. Bofors, a 20-mm. Oerlikon and twin .50 caliber machine guns on its conning tower. Nazi subs trapped on the surface lately have tried to shoot it out with protecting blimps or aircraft, on one occasion bagging one.

Cunard Line Takes Wings

Steamship Co. to Fly Air Routes

Stockholders of the Cunard Steamship Company of Great Britain have voted to put their organization into the airline business, the British radio reported in an overseas broadcast recently. The decision was approved at a special meeting of the stockholders which voted that the Cunard company should be in a position to meet competition of regular airlines operating.

Aviation Training Films

Revisions in Servicing Policy

Revisions in the policy of servicing and furnishing aviation training films have been announced recently with installation of a number of film libraries at air stations and other centrally located bases in the continental U. S. and foreign areas. The new system will give prompter service on requests.

General training films required for one-time showing may be secured on loan from central libraries or distribution points. General interest films and news films, usually of a timely nature, are circulated from these points to all activities. Specific training films required for frequent use should be secured from the library or ordered from the Chief of Naval Operations (OP-33-j) for permanent custody.

IN CONTINENTAL U. S. A.—*Aviation film and literature libraries* are being maintained jointly by Fleet Air and other activities at NAS Quonset, Norfolk, San Diego, Alameda and Seattle with sufficient prints to service air groups and activities in their respective areas. Sub-libraries are being established at other NAS and NAAF in these areas.

Marine air activities are serviced by MCAS, Cherry Point and Marine Fleet Air, West Coast, San Diego. NAOTC units are serviced from Jacksonville while NATTC activities at Pensacola and Corpus Christi are supplied from libraries at those two points. NAPTC, NATTC and LTA units are shipped films on request or allocation by their respective commands.

OUTSIDE CONTINENTAL U. S. A. — *Aviation film and literature libraries* are being set up in accessible locations to service all naval and marine aviation activities outside the continental United States. These film libraries will maintain a supply of training films and will have on hand projection equipment for loan to squadrons and units in local areas. In the South Pacific, aviation film and literature libraries are being established at AIR CENTER NAVY No. 145, AIR CENTER NAVY No. 140, and MARINE AIR GROUP 24. A central library has been established in the Hawaiian area at NAS NAVY No. 128, with sub-libraries at CASU 2, 4, 31, 32 and Hedron 2 for servicing activities in their local areas. Another central library has been set up at MCAS NAVY No. 61, with sub-libraries at NAS NAVY No. 309, No. 1504 and No. 311. Films and projection equipment are being sent direct to NAS Sitka, Dutch Harbor, Kodiak, Hedron 4, and Fleet Air Wings 15, 16 and 10 for distribution to naval and marine activities in areas in which these units are based.

How to Order Films and Equipment

Naval Aviation Film libraries and activities, including Marine Corps Air and Coast Guard aviation training and operating units, may obtain prints of training films by directing an official request to: The Chief of Naval Operations (OP-33-j). Units of the Functional Training Commands should route requests via the Training Command. Operating units should route requests via Administrative Commands. Other aviation activities should route requests direct to the Chief of Naval Operations (OP-33-j). Motion picture prints will be supplied in 16 mm. width and slide films in 35 mm. width. In each case, request should include complete title of the film and the Navy serial number.

MOTION PICTURE PROJECTORS (16 mm.) and slide film projectors (35 mm.) may be secured by directing an official request to: The Chief of the Bureau of Ships via the Chief of Naval Operations (OP-33-j) via the Chief of Naval Personnel.

Portable motion picture screens may be secured by an official request direct to: Supply Officer in Command, Naval Supply Depot, Mechanicsburg, Pennsylvania, or Naval Supply Depot, Oakland, California.

Spare parts for projectors (lamps, bulbs, etc.) may be secured by directing an official request to: Commandant of the Navy Yard, New York, or Mare Island.

Train on Plastic Pistols

Used in Hand-to-Hand Drills

The creation of plastic pistols exactly duplicating the .45 service pistol in every detail, including weight and balance, are proving realistic for hand-to-hand drills, especially for use in the

DUMMY PISTOL LOOKS LIKE THE REAL ARTICLE

disarming phase of the training. For this type of training, dummy pistols are used instead of real weapons which might be damaged by dropping.

Check Future Requirements

Program Orders Advance Parts

NAS, BANANA RIVER—To conserve and preserve motor vehicle equipment, the transportation officer here has developed and inaugurated a preventive maintenance program.

Basis of the program is a control board divided into five columns: *1.* Department to which vehicle is assigned; 2. Vehicles identified by station number, USN number, and type of vehicle; 3. Mileage and date of 1,000-mile or 30-day inspection and 5,000-mile inspection; *4.* 15,000-mile inspection; and 5. 30,000-m. inspection.

The control board serves two purposes: It is an immediate check on future requirements of all station equipment, and it allows time to order any replacement parts in advance of the 15,000- and 30,000-mile inspections.

BEST ANSWERS

XI—Aircraft Engines

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

1. Detonation in a cylinder signifies that—

- ☐ *a*—mixture is too rich and too many particles of fuel are burning
- ☐ *b*—an exhaust valve is not completely closing, causing leakage
- ☐ *c*—explosion flame is progressing from one point to rest of chamber
- ☐ *d*—combustion of the charge of fuel takes place too abruptly
- ☐ *e*—spark timing is too far retarded for that rpm.

2. An exhaust analyzer works on the basis that—

- ☐ *a*—hydrogen in the exhaust has less thermal conductivity than air
- ☐ *b*—a lean mixture produces more hydrogen than a rich mixture
- ☐ *c*—exhaust gases from a richer mixture have higher thermal conductivity
- ☐ *d*—carbon dioxide has higher thermal conductivity than air
- ☐ *e*—exhaust gases from leaner mixture have higher electrical resistance

3. A boost venturi in the injection carburetor—

- ☐ *a*—increases the venturi pressure of the incoming air
- ☐ *b*—is a smaller venturi set in throat of larger venturi
- ☐ *c*—meters fuel into the incoming air
- ☐ *d*—can be opened or closed as desired with pressure changes
- ☐ *e*—increases in size as air pressure increases

4. An idle cut-off stops an engine by—

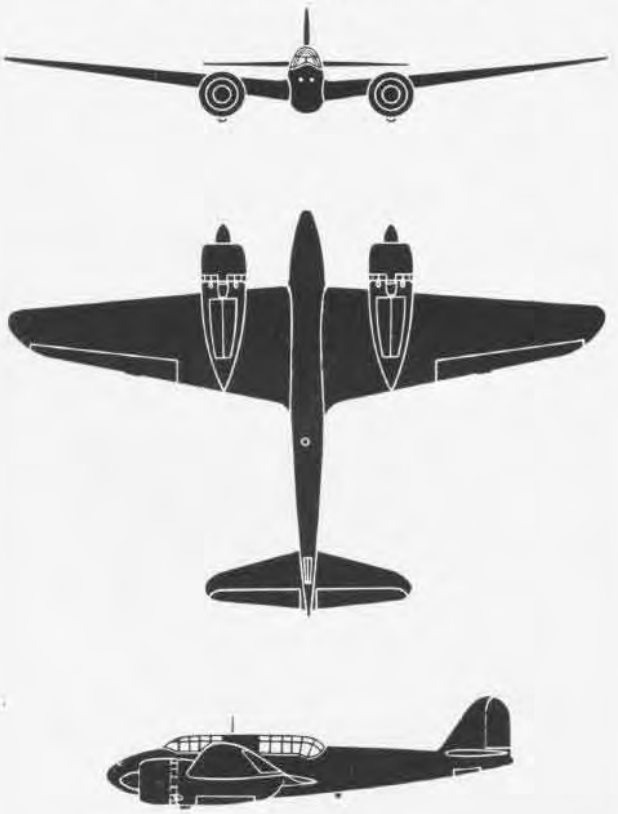
- ☐ *a*—exhausting the air from the carburetor float chamber
- ☐ *b*—shutting off the air bleed
- ☐ *c*—closing the main metering jet
- ☐ *d*—closing up the main air scoop
- ☐ *e*—shutting a butterfly valve in the venturi

5. There is great danger if the magneto switch becomes disconnected because—

- ☐ *a*—magnetos may burn themselves out
- ☐ *b*—engine may stop in the midst of a take-off
- ☐ *c*—engine may start with a slight movement of propeller even though the switch reads "off"
- ☐ *d*—engine will have to depend on battery ignition
- ☐ *e*—engine cannot be started for a quick take-off

PROBABLE NEW JAP FIGHTER

PROVISIONAL
FROM DATA CURRENTLY AVAILABLE



DISTINGUISHING FEATURES: Twin-engined mid-wing monoplane. Engines are underslung, with a deep nacelle continuing back under the wing to the trailing edge. The fuselage is unusually slender and well streamlined from the pointed nose to tail. The wing, engines, greenhouse, and tail closely resemble those of the Jap plane, *Lily*.

INTEREST: This plane has been reported operating in the South Pacific area for the last few months. Very little was known about it until some recent photographic data were secured by our attacking aircraft. It is now an operational plane and will probably be seen in increasing numbers as the war progresses.

A twin-engined fighter has been reported occasionally from China during the last year, but is described as closely resembling *Dinah*. Since the one illustrated here bears so much resemblance to *Lily*, these two twin-engined fighters may not be the same plane.

NAVAL AVIATION NEWS

Seabees Build Bases

Disarming Live Bombs

Visibility of Life Rafts

Dec. 1, 1943

RESTRICTED

SEABEES BUILD AIR BASES

WHEREVER THE NAVY'S PLANES FLY SEABEES FIRST PREPARE THE FIELD, BUILD THE FACILITIES AND SOMETIMES BEAT OFF ATTACKS OF THE ENEMY

CONSTRUCTION BATTALIONS PREPARE FIELDS FOR NAVY'S COMBAT PLANES

NAVY planes are operating from landing fields all over the world—from the Aleutians to the South Pacific—built for them by the sweat, and often blood, of naval Construction Battalions. The Seabees, volunteer construction workers who both build and fight, pride themselves on being able to construct or repair anything anywhere. Operating under the Bureau of Yards & Docks, they are the newest branch of the Navy but, already past their 240,000 quota, have suspended recruiting.

Seabees come in on the heels of the first Marine attacking forces to build and repair the airfields so necessary to attack the enemy. They construct anti-aircraft emplacements and man the guns when raiders strike. Originally the Seabees built the landing fields, dispersal hangars, buildings and facilities for naval air bases. Later they were given the job of handling munitions and supplies from ships in combat areas, doing stevedoring work. Their newest job today is to maintain and operate the many advanced bases which they have built for naval aviation throughout the world.

Each Seabee battalion comprises 4 construction companies of 224 men each and one headquarters company of 169 men. The new maintenance detachment consists of 275 men. Wake, Guam and Midway Islands demonstrated that civilian laborers were a liability to defense, so the Navy began in earnest to enlist its own builders who could fight as well as work. Today there are 200 Seabee battalions commissioned.

They construct all the facilities naval aviation needs outside continental United States—landing fields, seaplane ramps, airfield installations such as gun emplacements, machine shops, powder magazines, gasoline storage tanks, water distilling units, power and refrigeration plants and telephone systems. They also build things for all other naval activities as well as aviation.

Here's a typical Seabee operation. They were put ashore on a small South Pacific island. They surveyed the best location for a Navy landing field. As soon as the site was laid out, towering palms were dynamited, bulldozed or cut out. Tons of rock were blasted out of lagoons to provide runways and roads, and crushed coral was laid as a base for interlocking steel mats. Bridges were thrown across streams and wagons built to haul supplies up from the shore.

Seabees Built Airport From Scratch

The Seabees lived up to their motto of "Can Do" by putting in barracks for the naval aviators and ground crews, constructing hospital units, Quonset huts, power plants. Gun emplacements were set out to guard the new operating base. Seabees are camouflage artists too, and hide their buildings as they go along. One Seabee battalion built a jungle airfield in 13 days, 11 of which it rained so hard the gauge showed 16½ inches of precipitation. Work went on 24 hours a day but on the 13th day a 3,000-foot runway, 150 feet wide, was surfaced with coral rock and ready for planes.

Battle-scarred from a recent engagement in the South Pacific, the *Enterprise* put into port and 75 Seabees came aboard to repair the ship. While they were at work orders were received to put to sea again, for a new encounter with the Japs. The Seabees went along and actually completed part of the repairs while the carrier was in battle.

AMERICAN methods often offer a striking contrast to the Japs. In the year that the enemy occupied New Georgia, they did little construction work with the exception of heavy log-and-coral pillboxes. Munda airfield appeared to have been built by hand. Ten days after American forces landed at Segi, a plane made an emergency landing at a Seabee-constructed airfield. Nineteen days after the occupation, the field was ready for operation use.

Shell and bomb-blasted Munda was operating eight days after its capture although the Japs had been unable to operate from it for several months. (*See* PRELUDE TO INVASION, *this issue.*) The story in the Aleutians parallels the South Pacific saga. Where battalions in the latter islands battled land crabs, tropical diseases and Japs, Seabees in the fog-shrouded north fought mud, rain and Japs. Fields that were morasses of mud soon were accommodating heavy PBY's on their steel-mat surfaces. Weather-proof huts were as important as heavy clothes if the Navy's patrol planes and bombers were to operate from such places as Attu, Amchitka, Kiska and Kodiak fields.

But Seabees are not limited to the Pacific area, as dozens of swiftly-built naval air bases from Iceland to Free-

FIGHTING AND WORKING, SEABEES

SEAPLANE landing ramp goes up where this Seabee surveyor is laying out cofferdam site

AIRBASES for Navy combat planes to land take little time with Seabees using shovels

STEVEDORE work, unloading gas for Navy's planes, one of many tasks done by the Seabees

ALEUTIAN anti-aircraft gun emplacement set up by Seabees, who also know how to shoot it

town, West Africa, will attest. Others are located at such widely-separated spots as Algiers, North Ireland, Bermuda, Panama, Newfoundland, Sicily, Corsica, Sardinia, Greenland, and on numerous West Indian islands.

Showing the variety of work required of men on Seabee duty, the following specialized training is given them: diving, signaling, fire-fighting, carpentry, passive defense, photography, drafting, demolition, subgrade construction, lubrication, gas engine mobile equipment, piping and heaters, stills, welding, refrigeration, radio, generators, pontoons, seamanship, wharves and docks, tanks and masts, earth-moving shovels, bulldozers and cranes, rigging and ship stowage, and even laundry operation comes under their cognizance.

All of the work of the Seabees is not on the battlefronts. One battalion scaled Mt. Hamilton, 40 miles from their camp in the California hills, to salvage a wrecked Navy training plane. They built six miles of road on the side of the mountain and towed the wings and fuselage out by jeep and bulldozer, four days ahead of schedule.

The Seabees have as much esprit de corps and "company pride" as any division of the Navy. Their accomplishments speak plainly for the corps.

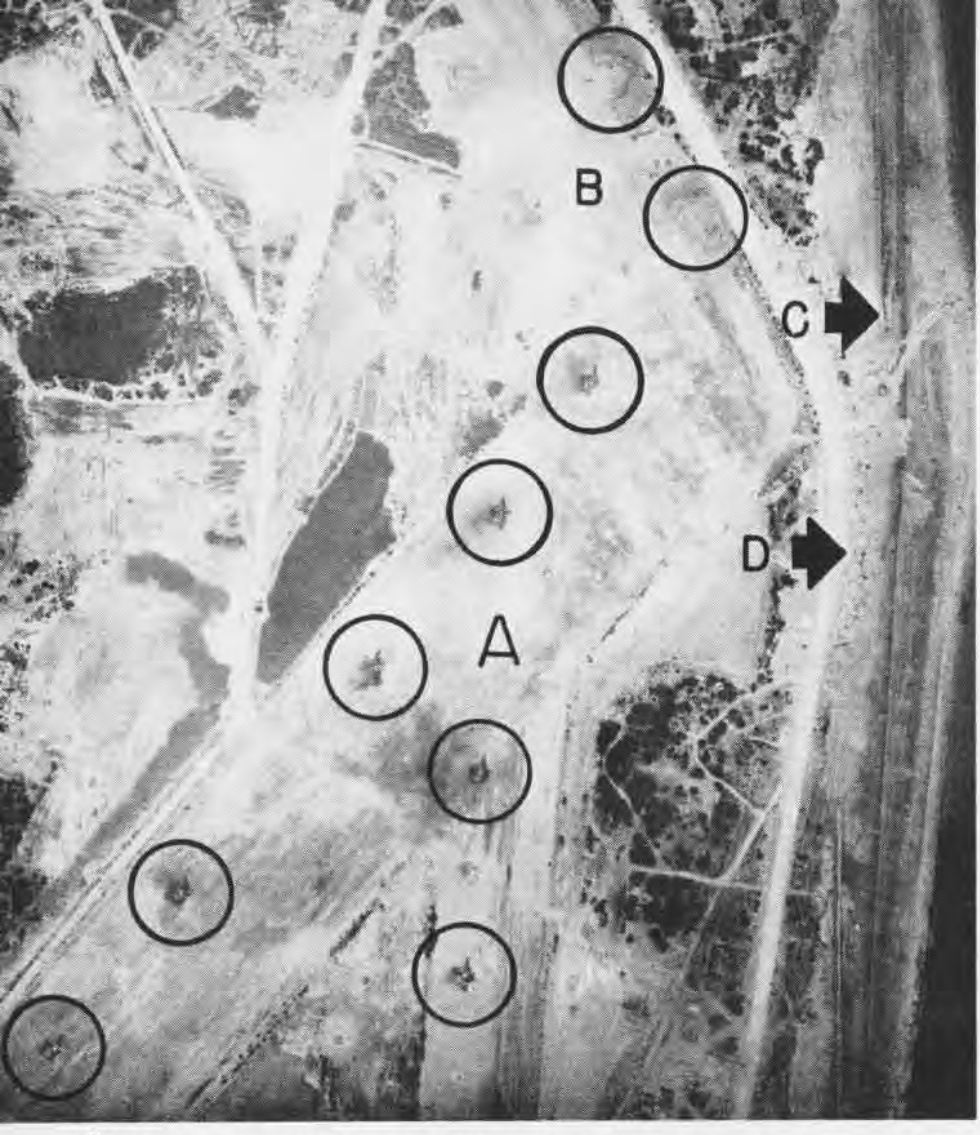
PAVE WAY FOR NAVAL AIR ACTION

DAMP conditions fail to slow up these men laying out plane runway ramp on South Seas island

UNLOADING scout bomber for Navy to fly another task done by thinly-clad Seabee crew

WORSHIP under the peaceful palms in a "church" set up by Seabee crews for naval aviators, with scout bomber for background and pews made from planks set on crated tail fins for heavy caliber bombs which may soon hit Japs

RAID ON WAKE ISLAND

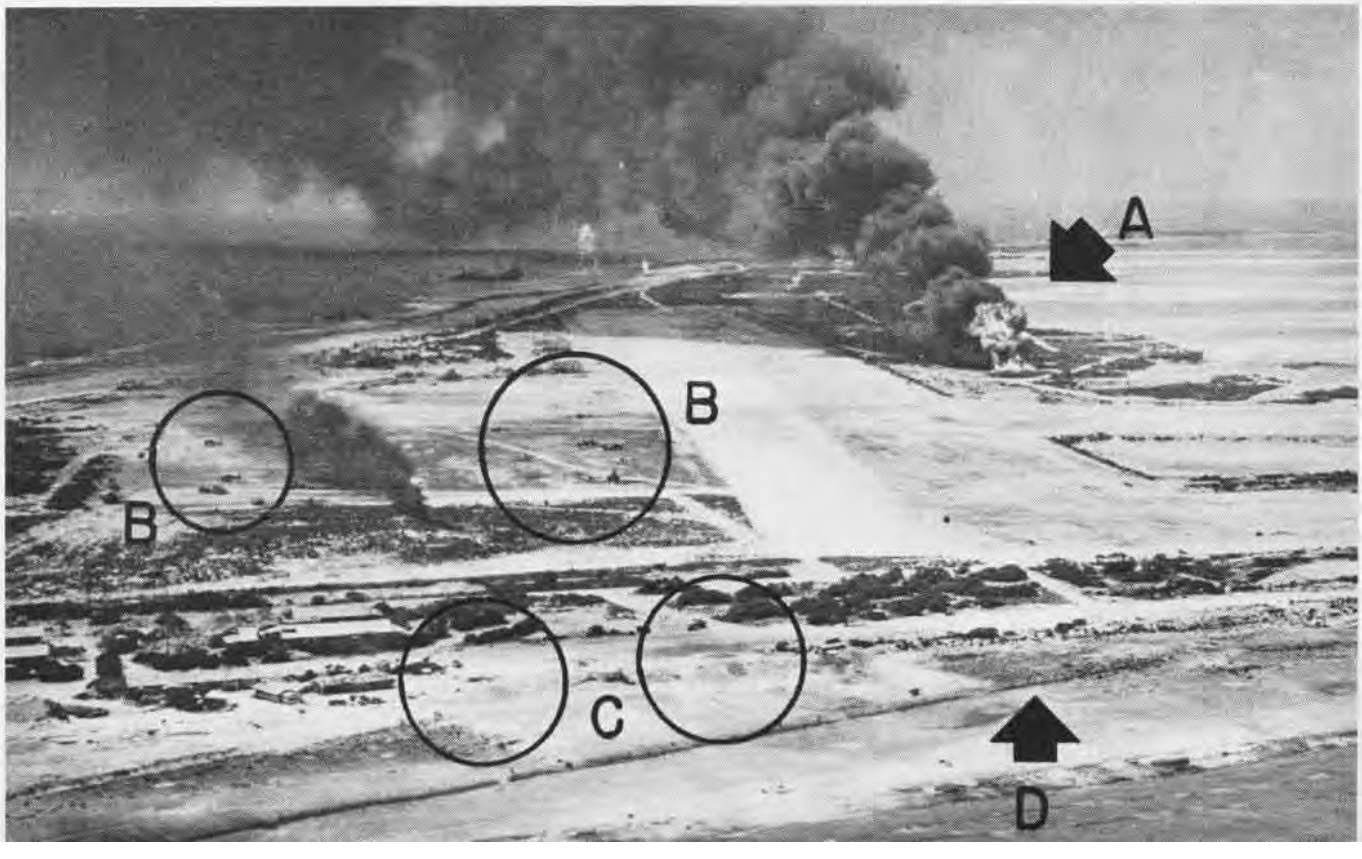


A. JAP BOMBERS DESTROYED BY STRAFING
B. REVETMENTS BUILT TO PROTECT PLANES
C. TRENCHES AND BARBED WIRE POSITIONS
D. TRENCHES AND MACHINE GUN POSITIONS

A. FUEL DUMPS BELCH BLACK SMOKE, FLAMES
B. JAP FIGHTER PLANES, "ZEKES" AND "HAPS"
C. GUN POSITIONS PROTECT WAKE'S BEACHES
D. TRENCHES, BARBED WIRE CIRCLE ISLAND

HERE is photographic evidence of the job Navy fliers are doing to make it hot for the Japs on Wake Island. These shots, taken by carrier-based planes during a recent two-day attack against the Japanese-held island, show the enemy caught napping—their bombers left wrecked and blazing on the runways. Out of 18 medium bombers on the airfield, all were destroyed except one, which was in an isolated part of the field and already dismantled. These planes were largely *Nells,* the principal bomber used in the conquest of the Philippines and East Indies, and *Bettys,* one of Japan's most modern aircraft and a consistent raider in the SWPA (A circles at left).

Photo below shows some fighter planes, *Zekes* and *Haps,* caught on the field during the attack. Many of these were destroyed on the ground or in the air. Heavy damage to concentrations of buildings and water storage facilities is not shown in these photos but the low oblique (*below*) shows two of the fuel dumps blasted and left burning.



TIPS FROM EXPERIENCE

How to Swim Ashore Safely

Technique Often Saves Injury

NAS, PENSACOLA—The proper technique for a swimmer to make a landing in rough water on a rocky shore has been outlined by a naval training school officer who has made several hundred such landings with no injury other than minor cuts:

1. Rocky shores or reefs are to be avoided if possible but they are not necessarily dangerous to life or limb unless in extremely rough water.

2. It is almost mandatory to retain footgear as rocks or coral cut the feet badly. At least one thickness of clothing should be worn to protect the body from cuts and exposure.

3. After examining the shoreline from the crest of a swell when it is necessary to make a landing, the swimmer should make his approach toward a locale where hills slope toward the sea rather than where cliffs line the shore. At the mouth of a ravine or at the foot of sloping hills, there is usually a small beach even on a rocky coast.

4. Next step is to locate a cove identified by a point of land extending a little out to sea. The swimmer should *not* try to land on the point as waves generally make the beach at an angle, indicating quieter water to the lee of the point.

5. Should the approach be barred by a heavy growth of seaweed, this is to the swimmer's advantage because water is quieter in the lee of the seaweed. He should *not* swim through seaweed but crawl over the top grasping the vegetation as far in advance as possible.

6. Observe the shoreline for a place where waves rush up on the rocks, rather than breaking down. Avoid any places where waves burst with a high, white spray. In making an approach it is best to swim slowly, because holding to the rocks requires a great deal of energy.

7. Rest momentarily at the edge of the breakers and study the rocks; pick one that seems rough enough to offer hand grips. By removing life jacket and holding it with one hand the swimmer will be carried faster in surf. Abandon the jacket only at the final moment when both hands are required to grip the rock or if the speed traveled threatens to submerge the swimmer.

8. After determining landing point, advance into breakers following a large wave. Face shore, and assume a sitting position with the feet in front two or three feet lower than the head; thus the feet will absorb shock if swimmer collides with any submerged boulders or reefs.

9. If shore is not reached on the first wave, attempt to retain former position on rocks or swim with hands only. As the next wave nears, assume sitting position with feet forward and if necessary, repeat procedure until landing is made.

10. When a large rock offers safety, attempt to reach the desired land by holding on the rock at the crest of the wave and hang on until the wave recedes; then seek a new hold higher up by the boost offered on the next wave, when it may be possible to climb away from the surf to safety.

The technique for crossing a reef is the same as for rocky shore landing; the swimmer must keep his feet fairly close together and knees slightly bent in a relaxed position while sitting so that when contact is made with reef or rock, knees will serve as a cushion to avoid severe shock or injury.

Take-off Procedures at Sea

Report Excerpts Have Good Cues

Take-off procedures adopted after forced landings at sea by two captains of Pan American Airways provide experience data of interest to naval aviators. NANEWS *excerpts these from official reports.*

Captain M stayed with us for a couple of hours and then took off (in a PBM3R) to lead the destroyer to us. We had talked over the landing and take-off over the phone and I had suggested to him to use a take-off technique that Capt. SJW of the Miami Division had told me about years ago.

As fantastic as it may sound, the take-off is made almost dead down wind, surfing with the swells. The start is made with the swell directly behind you, and you surf with it. The acceleration is incredibly fast; you then attempt, if possible, to turn enough to stay on top of the swell. I found out afterward that Captain M was familiar with this technique, learning from the same source that I did—Captain W. I asked him to make the take-off as close to me as he could so that we might be of some assistance in case of an emergency and also so that I could observe it. I've never seen such a short take-off.

Conservatively I estimate that he was airborne with 750 feet and I actually believe it was much shorter than that. He surfed down one swell and was in the air by the time he was on the crest of the one that had been ahead of him. He did not quite have flying speed and came back on the second swell that had been ahead of him, touched it lightly and was in the air for good. I estimate that his take-off was made at least three-fourths down wind with a 15-knot wind. The swells were about 15 feet and the sea slight but choppy.

Portion of the report on Captain H's take-off in the PB2Y-3 *the following day:*

The wind had increased during the night and I estimated the swells were approximately 20 feet high by this time, with about a 15 to 17 knot wind blowing from the east. The sea was so bad that we had difficulty in getting the motors warmed up as occasionally almost solid water would hit the propellers. *It would have been impossible to take off into the wind and against the swells.* I had not intended even trying to, however, and I used exactly the same technique which Captain M had used. I had requested 20° flap; take-off was so fast that First Officer was unable to get the flap down more than 10° before we were in the air.

We got off in approximately the same distance that Captain M did with four or five knots more wind and a 4 to 5 feet higher swell running. It is obvious that this technique is the only technique that can be successfully used with large planes in the open sea, *i.e.*, starting dead down wind with the swells at your stern and surfing with them and attempting to stay on top of swell ahead of you when you started.

▶ ORGANIZATION CHART LISTED IN CONTENTS FOR PP. 16, 17 IS WITHHELD FOR PUBLICATION LATER

SHORE STATIONS

NPFS, CHAPEL HILL—The U. S. Navy Pre-Flight "B" team and Duke University's junior varsity became the first two football teams ever to be transported to the site of a game by glider plane when they traveled by that method to Camp Mackall recently.

Three C-47 transport planes, each towing a CG-4A carrier glider, took off from the Horace Williams Airport here. Forty-five minutes later the two teams were at Camp Mackall, 75 miles away. Half the boys were carried by gliders; the other half in transports.

NAPTC, KANSAS CITY—The CAA has issued the following cautions on the handling of high-test gasoline:

† Aviation gasoline generally has lead added to increase its "Oomph," and lead readily enters the human system on contact with the skin. That cool feeling of quick evaporation does not signify that the poisonous lead substance has gone, and wiping the skin dry of gasoline drives its lead content into the pores. This may cause definite lead poisoning or slow-healing sores.

† Leaded gasoline should be washed off skin and out of clothing with a good mineral solvent, followed by plenty of soap and water, and then thoroughly dried. If it gets into the eyes, olive oil should be applied immediately (castor or mineral oil is also useful), and the victim taken to an ophthalmologist. Gasoline on the skin beneath clothing will cause blistering, and if the clothing itself is wet may induce severe burns. Gasoline soaked rags should never be put in a pocket or other confined place.

† Gasoline fumes are both toxic and explosive. They render the human brain inactive, even when the quantity is insufficient to be detected by smell. Whenever this odor is detected the entire area should be ventilated at once, and the source of the fumes located and corrected.

† Fumes from gasoline are heavier than air and fill low spots to an explosive point before they rise to the level of human scent. There should be no smoking, and positively no lighting of matches in any confined place where gasoline is stored, or even outdoors in the immediate proximity of this powerful liquid.

† Gasoline should not be left in an open container or poured from one container to another unless good ventilation prevails. And if any is spilled it should be immediately cleaned up and any gasoline soaked rags or waste safely disposed of promptly.

† Aircraft during refueling should be grounded as a precaution against static electricity discharge which may cause fire or explosion.

† New gasolines now being produced are said to increase the power derived from aviation engines from around 23% of the potential up to 35%. This means a terrific increase in explosive power, which bomber and fighter pilots will appreciate but which will make it just that much more temperamental.

NPFS, ST. MARY'S—The very ultimate in military training was observed the other day when four cadets with ankles out of alignment were seen coming from Sick Bay swinging in perfect unison on their rather ungainly crutches to the cadence of HUT, SWING, THREE, SWING.

NPFS, CHAPEL HILL—Kicking the rusty North Carolina dust in route step, a column of cadets clumped to a halt on a narrow road. Into the woods cluttered with heavy undergrowth and roofed with tall loblolly pines moved a group headed by a lieutenant and a brace of ensigns wearing unseamanlike woodsman's boots and hunting knives. The newest course in the Navy's crowded curriculum for aviation cadets was about to begin: lessons in woodcraft for the young future fliers who might some day find themselves afoot and alone.

While cadets watched, officers demonstrated some lore of survival. One found a swampy spot, dug up edible roots of cat-tails. Another showed how to twist a fish line from a thorned twig. A third whacked out a four-foot section of wild grapevine which dripped a cupful of clear water, surprisingly sweet and cool.

Eventually cadets will be tossed a 40-lb. pack. They will be trucked off 30 or 40 miles, given a compass and told to find their way home.

NATC, CORPUS CHRISTI—In a survey conducted among aviation cadets and enlisted men and women at NATC, deep yearning was expressed for a white Christmas—and the Christmas tree they knew back home. As one bluejacket put it, "You can't just hang your G.I. socks on a G.I. bunk and call it Christmas."

NAS, SEATTLE—Leisurely rising, non-uniform dress, a beautiful island for hunting, fishing, swimming and other recreation, comfortable barracks, good food—it all sounds like a serviceman's Utopia. The name, however, is Whidbey Rest Camp and it's a reality—not a dream.

Ideally located in an excellent hunting and fishing country, the Rest Camp established on Whidbey Island has been approved by the Commander Fleet Air for the use of officers and enlisted personnel of Fleet Air, Seattle, and visiting aircraft units.

NPFS, IOWA CITY—Strangest case in Sick Bay records is that of the cadet who came down just before taps one recent night asking treatment for a rat bite. The boys had cornered the monster in a waste basket but the young Frank Buck was nipped when he tried to bring it back alive.

MCAS, ST. THOMAS, VIRGIN IS.—Forty-two survivors of a torpedoed merchant vessel in the Caribbean area were rescued recently by personnel of this station. The crew learned that a vessel was sunk and proceeded to the site under adverse weather conditions. They maintained a 6-hour vigil until surface vessels could arrive and pick up the survivors, who were floating in the water and on bits of wreckage.

All combat crew members have exhibited great care and energy while flying in this area, but it is all in the day's work for St. Thomas Marines. The pilots have accumulated hundreds of hours of over-water flying in single-engine landplanes, and all but the very newest pilots have assisted in the rescue of survivors.

NAS, OLATHE—The A&R Department has designed and is using a time-saving device for trueing landing gear brake drums to insure that braking action will be more safely distributed and balanced with respect to both wheels. It is essentially composed of a motor-driven sanding wheel which can be manually revolved about the brake drum. The wheel spindle is used as a fixture hub and the sanding disk revolves around the brake shoe. The result is that it smoothes down the high spots, thereby grinding a perfect circular shoe which, in turn, will bear evenly at all points within the brake drum. A No. U58 Thor Light Duty Portable Electric Sander is used. No. 24 or No. 50 paper is employed on a 5½-inch disk.

NATTC, CHICAGO—Forty per cent of all Navy personnel fall in age groups between 17 and 22, a survey taken at the beginning of the current fiscal year reveals. Of the 19 per cent of naval personnel under 20 years of age, the tabulation shows that two per cent are 17-year-olds; eight per cent are 18; nine per cent are 19 and another eight per cent are 20.

The largest single group are the 21-year-olds, comprising 11 per cent of Navy personnel. Placing second is the 22-year-old age group, with 10 per cent. Five per cent are 25-year-olds. Two and a half per cent are 30. One per cent are 35. One per cent are 40. Although Navy life is the best in the world, only one-tenth per cent are 45 or older.

NATC, PENSACOLA—The twelfth anniversary of the creation of J. Gosling, the feathered prototype of the naval aviation cadet, who has been the squawking, yet devoted, mascot of Pensacola flight students ever since his birthday, was observed recently. The creator, now an associate radio engineer in the A&R Department, noticed back in 1931 the similarity between the landings of geese and the NY seaplanes and suggested the insignia. Thus, J. Gosling antedates the now popular Donald Duck by several years.

NAS, BUNKER HILL—"Pop-off" sessions, a new method of cadet expression, has been instituted at this station. The regiment meets for fifteen minutes two or three times weekly with the regimental officers present. Any cadet may take the floor for himself and his mates. If his subject is on the right track, his shipmates signify their agreement by applause or encouraging remarks. If he is off on a tangent, the sounds issued from the assembled cadets are easily interpreted.

When a good suggestion is made, no time is lost in putting it into practice. The officer-in-charge acts immediately or takes it up with his superiors. Reports indicate morale and efficiency of the regiment have improved greatly as a result of this innovation.

USNM, BRAZIL—Exactly four years from the day it was first placed in service with the U. S. Naval Mission in Brazil, a J2F3 plane was recently shipped to an overhaul facility in the United States.

Just twice in four years was the plane out of commission except for routine checks. Once a landing gear was wiped out in a landing accident and the other repair job called for replacing an engine cylinder following failure of a piston ring.

During the 48 months of continuous amphibian service, the plane underwent all the rigors of tropical sun, humidity and water landings, while being serviced by the same plane captain, recently promoted to Chief Machinist.

ERRATUM—*Printed upside-down:* Cut in lower right-hand corner of page 23 of *Defensive Tactics Against Fighters*, confidential manual recently published and distributed by Aviation Training Division. NANEWS has been asked to call attention.

SHOW ME THE WAY TO GO HOME

Dead Reckoning and Celestial Navigation Problem

(A) On May 1, 1943, a patrol plane was on a course of 062°. At ZT 0830 the DR position was Lat. 29°-29′ S, Long. 158°-36′ E, GS 140 k, flight level 16,000 ft.; at about the same time, the navigator made the following observations of the Moon and Sun with a bubble octant, the I.C. of which was (–) 9′. Solve each sight for Hc, "a" and Zn, plot and label the LOP's, advanced or retired to ZT 0830. State the Lat. and Long. of the fix.

	Moon	Sun
	ZT 08h–27m–00s	ZT 08h–36m–00s
	h_s 58°–52′	h_s 20°–17′
1.	Hc	4. .....
2.	"a"	5. .....
3.	ZN	6. .....
		7. Fix Lat. .....
		Long. .....

(B) You are navigator of a PBY whose ZT 2140, June 30, 1943, DR position was Lat. 26°-38′ N, Long. 173°-12′ W on Cus 036°, GS 132 k, flight level 20,000 ft. At about ZT 2200 you made the following observations with a bubble octant whose I.C. was (+) 7′. Solve the sights, plot and label the LOP's, advanced or retired to ZT 2200. State the Lat. and Long. of the fix.

	Altair	Polaris	Arcturus
ZT	21h–56m–58s	22h–00m–02s	22h–06m–29s
h_s	46°–28′	26°–12′	48°–27′
8.	Hc	11. Q corr.	12. .....
9.	"a"		13. .....
10.	ZN		14. .....
		15. Fix Lat.	
		Long.	

(Answers on page 30)

FRONTAL THUNDERSTORMS

THIS is a report on thunderstorm activity encountered by a Navy pilot* on a summer flight from Washington, D. C., to Memphis, Tenn. The flight through a thunderstorm area in advance of a surface warm front emphasizes some of the important points in BuAer's T.N. 34-43 (See NANEWS, issue of 7/1/43).

IN PREPARATION for a flight from Washington to Memphis, I made a study of the weather for the previous 24-hour period. The 0730 weather map (next page) indicated a slowly moving warm front in vicinity of Knoxville. Upper air data obtained by radiosonde were studied. The aerologist pointed out that warm air rising over the cold wedge in advance of the surface front was unstable and would give considerable thunderstorm activity. Forecast indicated thunderstorm activity beginning in early afternoon and becoming worse.

During flight while cruising at 8,000 ft. on top of overcast, towering cloud formations appeared increasing in height until it became necessary to enter some of the storms. Approaching a large storm area having a rabbit-ear appearance, I decided to alter flight path between the large towers. During this procedure, I flew on instruments about four minutes. Later another thunderstorm having an anvil top was approached. I had to enter it as it was too extensive to fly around. I approached the advance side above the turbulent area and passed through a thin section of the main tower. Taking time of year and terrain into consideration, I knew icing conditions prevailed at higher altitudes.

While cruising at 8,000 ft. from Pulaski, Va., to Tri City, Tenn., I noticed a large thunderstorm covering 30 to 40 miles directly ahead. Owing to season and temperature, it was advisable to go through storm as low as possible, as air temperature indicated icing conditions were present at higher altitudes. Also, vertical currents of air were increasing with altitude. I descended to 6,000 ft. after receiving ATC clearance for cruising at that altitude. I studied the thunderstorm carefully to determine best position to enter it.

Formation of the tops (about 35,000 ft.) showed two thunderstorms had joined. It appeared that ceilings below storms were about 2,000 ft. I turned to the west, cruising parallel to the storm front until I noticed a point between two heavy rain areas.

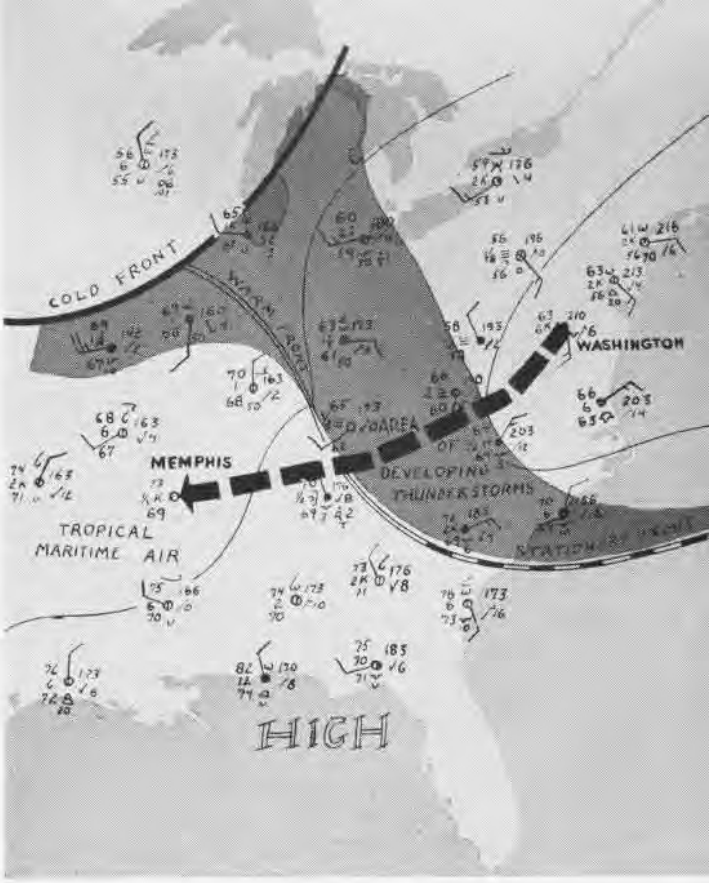
I selected a position at 6,000 ft. that would place the flight path between the rain areas. Very little turbulence was noted passing through the storm. I encountered heavy rain but experienced no flying discomforts. All flying through this storm was on instruments. Thunderstorm activity predominated the plane's entire flight.

* The pilot who made the flight described here has had 19 years of naval service—14 years as a Naval Aviator. He has flown civil airways for three years and has logged more than 4,500 hours, including 2,500 transport.

THIS FLIGHT was planned from study of weather maps and hourly teletype weather reports, and radiosonde data were used to determine type of air masses governing area over route. Weather encountered had been expected, and it was known that part of flight would have to be made on instruments.

During flight I kept close check of cloud formations (mostly tops), temperature and temperature changes, and cloud color to determine density of the storm and altitude at which area should be approached. I avoided towering cumulonimbus clouds as violent turbulence was evident in them. As air temperature indicated icing conditions at altitudes above 8,000 ft., I flew at or below that level.

[Although thunderstorms met on this particular flight were not extremely violent, the report indicates type of weather and flying conditions a pilot should expect when flying through such an area. When a "contact" pilot sees a weather map like the one accompanying this article and receives a forecast of "considerable thunderstorm activity beginning in early afternoon and becoming worse as afternoon progresses," he should plan no flight toward an approaching storm area and *should stay on ground* as storm area approaches field.]

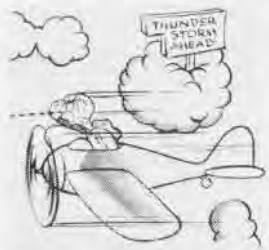


STORM TIPS TO PILOTS

1. Consult aerological officer. Study maps of departure and destination areas and areas that are in between.

2. When approaching a thunderstorm, analyze it before surrounding clouds are encountered. Make a thorough study of the situation.

3. Circumnavigate a storm if you find it possible to do so.



4. In coastal regions where thunderstorms prevail along mountains, fly a few miles to seaward and avoid them.

5. Fly around island thunderstorms which may be thousands of feet higher than those that are over open sea.

6. Cold front thunderstorms generally stretch too far to fly around. If you find that you have to go through, fly between the storm centers or over the saddlebacks.

7. If you can't see blue sky beyond storm and must go through, determine direction storm is taking and head in at a right angle.

8. Once you have headed into a storm, don't turn back. If you do, you'll have to fly through same condition twice and you may get lost.

9. In entering front of a thunderstorm, go in low and if conditions will permit, fly under the base of the storm.

10. Entering a storm from rear, you will experience downdrafts first. So go in high.

11. Don't fly underneath the thunderstorm unless you can maintain contact flight.

12. Never land at an airport when a thunderstorm is advancing toward field. Shifting surface winds make it too hazardous an undertaking.

13. When you expect to try high level flight in flying a storm, get altitude before approaching it, so that you are on top of cloud shelf around the storm line before selecting your course.

14. The altitude necessary to fly around tops and over saddlebacks of a thunderstorm will vary with seasons and latitude in which you encounter storm. In high latitudes, 12,000 to 15,000 feet is generally sufficient. In the tropics, tops of saddlebacks may be above ceiling of your aircraft and you may have to fly through saddlebacks on instruments—a procedure that is recommended only for high performance aircraft.

15. Lightning is of little consequence when you are flying an all-metal, closed cockpit plane. If you're flying an open cockpit plane or one with a plywood or plastic fuselage, it is better to keep away from lightning.

IMMERSION FOOT

WHAT TO DO ABOUT IT •

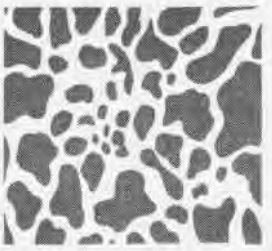
IMPROPER use of first aid in treating IMMERSION FOOT (also known as *Trench Foot* and *Water Bite*) many times has caused unnecessary pain and serious complications. It has, in fact, been the direct cause of amputation.

IMMERSION FOOT is generally found among survivors who have spent many days huddled together in a life-boat. Restricted movement of legs and feet constantly immersed in seawater creates a circulatory disturbance or constriction of capillaries and small blood vessels. Although no immediate pain is felt, feet and legs grow colder as circulation slows down. Contrary to popular opinion, extremely cold water is not the sole cause of this ailment. IMMERSION FOOT occurs in warm Southern waters as well as in the North Atlantic. It has been proved that water just cold enough to chill the extremities will produce the tell-tale symptoms.

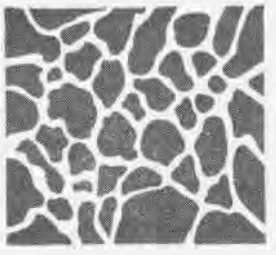
Indications first become apparent when the victim's feet begin to feel heavy, woody, and numb. Color of skin turns waxy-white and is spotted with purplish areas. Legs and feet are insensitive to pain or temperature, and later small blebs, or water blisters, develop which are unusually susceptible to infection. Gangrene can easily develop during this stage.

PROPHYLACTIC TREATMENT. This will aid a great deal to lessen the degree of thermal injury and prevent infection. It is important to keep the feet dry and warm. No item of clothing should ever be removed *unless* there is a tightness severe enough to cause a constriction. If shoes become uncomfortable, it is wise to remove them and protect the feet by greasing the skin and wrapping the extremities in odd bits of cloth. Elevate legs and exercise toes.

CROSS SECTION OF MUSCULAR TISSUE



NORMAL CAPILLARIES PERMIT BLOOD TO FLOW FREELY IN HANDS, FEET: DRAWING ILLUSTRATES LARGE PASSAGEWAYS WHICH ARE PRESENT IN NORMAL EXTREMITIES



CONSTRICTED CAPILLARIES SLOW DOWN BLOOD CIRCULATION; CAUSE NUMB AND WOODY FEELING IN MEMBER; FOLLOWED BY SORES AND POSSIBLY BY GANGRENE

Medical Treatment Will Save Feet

WHEN SURVIVORS are rescued with chilled, anesthetic, swollen, blistered feet, they should be carried aboard, and their skin protected against rupture of blisters and pressure necrosis (damaged tissues). Never rub feet nor paint them with strong disinfectants. Wounds, cuts and sores should be dusted lightly with sulphanilimide powder to prevent further infection. Blisters should be handled like a second-degree burn.

During this period of sterile inflammation, congestion of blood in deeper tissues will cause surface temperature to rise as high as 90 degrees. Unless this excessive temperature is reduced, blisters will swell and cause acute pain. The technical explanation is this: "Warming increases metabolic demand for oxygen on the part of cutaneous cells to a greater extent than can be met by the supply of blood through injured subcutaneous vessels. Anoxia therefore ensues with severe pain, increased extravasation of fluid, and necrosis of the skin."

Restoring use of limbs is a slow process, and may be accomplished by applying the theory of "treating cold with cold." Feet are surrounded with a dry bath towel, a layer of cotton waste, and a rubber sheet to keep extremities completely dry. Two to four ice-bags then are carefully placed around the patient's legs and allowed to melt slowly. As congestion of blood subsides, the number of ice-bags can be reduced and finally substituted with blasts of a fan.

ALBATROSS SAVES MARINE FLIER

MARINE CORPS AVIATION

Two divisions of F4U's took off from a South Pacific island to meet a bogey composed of approximately fifteen Betty's and Zero escorts. The experience of one Marine lieutenant is a typical example of what can happen in aerial combat and the ingenuity demanded to become a survivor who lived to tell. This is what happened to him:

"I could see three Zeros coming from my right, one of which had me perfectly boresighted and was shooting hell out of me. I dove down. Zeros were making runs on me from all sides. As I was diving, I saw oil going over the top of my hood. The gauge read 40 lbs. and finally dropped to 0. Air speed fell to 140 knots. The temperature of the cylinder head was sky-high. I skimmed along above the water at about 25 feet.

"By then I knew I was going to have to make a water landing, so I locked my shoulder straps, making sure they were fast by sitting back and then pushing forward again. I found no pressure on the controls when I pulled back on the stick, so I immediately put down a 50 degree of flaps and kicked hard right rudder. I hit the water at about 90 knots.

"The whole dash board came up and hit me in the face, but I wasn't knocked out. Blood started running down my nose and my lip was badly cut. The water was up around my waist when I started to climb out of the plane. I got out all right and blew up my life jacket. At the same time, I saw two Zeros go over my head but they didn't strafe me. I got out of my chute and inflated the boat. The paddles were missing so I just rested in the raft.

"During the afternoon, an albatross flew around me and made a landing in the water nearby. After a few moments it took off again but returned to land on my ankle. While it was looking the other way, I quickly put my other foot over its legs and held on to it for about five minutes. The bird raised such hell trying to bite me and moving around making a lot of noise, that I had to wring its neck.

"While I was choking the bird, it spit up about three fish in the bottom of the boat which I kept, thinking I would need them when I hit land. I tried paddling with two knives, but a half an hour of that proved useless so I gave up. I decided to try swimming so I went over the side of the boat, tied it to me, and tried to pull it along. I continued this in spells for the balance of the afternoon. At sundown, I got back into the boat and tried sailing. After a couple of hours, it started to rain, so I laid down in the boat, put the sail over me, and went to sleep.

"I awoke after awhile, very cold and wet. I heard a noise like a motor and then saw a ship headed west. It passed about 50 yards away. I tried to use my pistol. It wouldn't work. I looked for safety matches, but couldn't find them. I tried yelling. They didn't hear. Six of them went by altogether. I spent the rest of this night sailing, sleeping, watching and waiting.

"By morning I had drifted quite a way from land. Suddenly I saw four destroyers coming down the slot. They were about four miles to starboard of me—the closest passing about 1,000 yards away. I held up my sail in an attempt to make them see me, but the ship kept right on going. Then I spied the albatross. I picked it up quickly and violently waved it at the next passing ship. I thought they too hadn't seen me, but after a few minutes the destroyer started to turn around. Relieved? You couldn't measure it! I patted the old dead albatross.

"The destroyer threw me a line which was too small for me to grab well, and it slid through my fingers. They were going so fast that when I did get a grip on the line, it pulled me right out of the boat. I was dragged under water for a little while. My hands were very sore, but I was afraid to let go. They finally pulled me aboard and took me to the sick bay.

"The doctor went to work on my face, putting five stitches in my lip. I was given dry clothes and then went up to speak to the Skipper. He was very kind—even gave me a cigar which really tasted good, although the mechanics of smoking it with half a mouth all sewed up was somewhat involved!

"From now on, I'm going to carry a couple of good cigars, and I'll be on the lookout for an albatross!"

MARINE LIEUTENANT, A MODERN "MARINER," WAVES DEAD ALBATROSS TO ATTRACT ATTENTION

ATTENTION SQUADRON COs!

Does Each of Your Pilots Know

TECHNICAL ORDERS AND NOTES

Applying to Your EQUIPMENT?

TECHNICALLY SPEAKING

Sliding Valve Guide Remover

Utilizes Carbon Dioxide Gas

NAS, LIVERMORE—A "sliding hammer" type valve guide remover for R-670 Continental aircraft engines has been developed by the A&R department. It incorporates the use of carbon dioxide gas as the cooling medium for the shrinking of the valve guide in the heated aluminum alloy cylinder head, permitting quick removal of the guide.

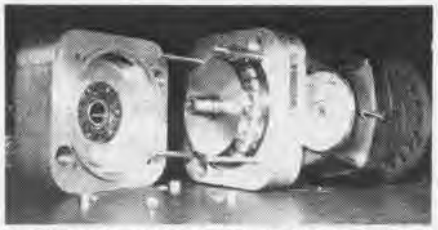
The puller consists of a flexible joint handle with a sliding hammer into which is inserted a perforated collet. From this the carbon dioxide gas is introduced by a flexible hose from a standard gas cylinder. Generally, only three or four strokes of the sliding hammer are necessary to remove the most stubborn guide without damage to the cylinder. Drawings are available for any activity that may be interested in the manufacture of this tool.

New Compressed Air Starter

Serves 3 Types of Engines

NAS, PEARL HARBOR—A compressed air starter for three types of aircraft engines has been developed at this station by a chief electrician's mate to remedy disadvantages of cartridge and electric starter systems.

Too often the cartridge starter would not turn over engines enough times, requiring the use of many cartridges before the engine would start. The electric starters on the test stand required battery power, since lines to stand do not carry the proper voltage. This required a constant supply of charged batteries for the R-1830, R-2600 and R-2800 engines.



COMPRESSED AIR STARTER PROVES ITS WORTH

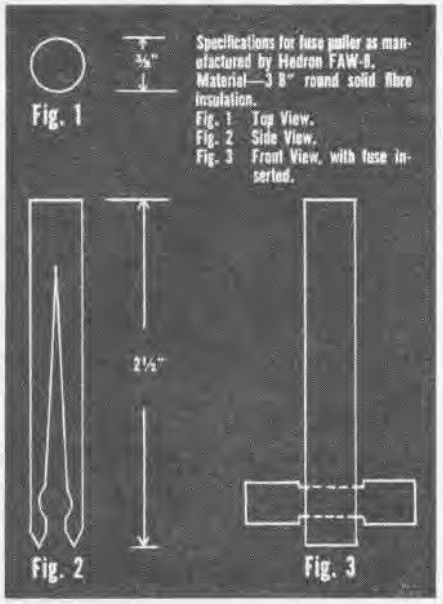
The new air starter is proving more economical and practical for use on the test stand than either of the other types. Made from a frame housing, cast from aluminum scraps and from old starter parts, starter is of simple mechanism. Compressed air is forced against cups in the flywheel, revolving the wheel which, in turn, is geared to the plane engine. Working drawings of this air starter are available from this station on request.

[DESIGNED BY W. E. BRUNER, CEM, USNR]

Fuse Holders in PV-1 Plane

Circuit Breakers in PV-2, P2V

HEDRON FAW 8—A fuse puller for use on the PV-1 fuse panel was originated by this squadron after several unsuccessful attempts to remove fuses with screw drivers without shorting circuits. Space between holders in the PV-1's main fuse panels is limited to ⅜", prohibiting rapid fuse replacement during flight. On several occasions while in flight, personnel have caused direct shorts, sometimes shorting adjacent circuits and burning out more fuses. The squadron also modified the PV-1 fuse panel further to prevent shorting and shock. It recommends that all PV-1's now in service be provided with a minimum of three fuse pullers (shown in drawing) and that all later model aircraft be equipped with panels similar to the disassembled fuse holder now used.



▶ *BuAER COMMENT*—**BuAer has requested that fuse pullers be supplied in accordance with the recommendation of Hedron 8. All PV-1's will be out of contractor's plant before incorporation of recommended fuse panel is possible. The PV-1 has fuses in electrical circuits, owing to procurement under Army specifications; new Navy models (PV-2, P2V) will have circuit breakers in lieu of fuses.**

Universal Plane Tow Bar

Useful to 15 Different Models

NAS, SAN DIEGO—A civilian employee here has devised a universal airplane towing bar that has proved a real manpower saver in the two years it has been used.

The following types of planes can be towed and backed by use of the bar: TBF-1, TBM-1, SNJ, F4F-4, F4U-1, SBD-5, F2A, JRF, J2F-5, R4D, O3U-3, SOC, SON, SBU, TBD-1, and others.

The bar has two chief advantages:

1. It saves the time of from one to two men whenever a plane is towed. One man can safely handle both tractor and plane when hooking up, backing or towing. Saving in man-hours is great, as from 50 to 100 planes are towed each day.

BAR ENABLES ONE MAN TO DO PLANE TOWING JOB

2. It protects planes from damage when being towed. The old rope towing method required an experienced man to ride the plane brakes when plane was being towed. Backing was impossible.

Other patented bars have been tried, but they were heavier and could not be handled by one man. These bars did not permit backing without endangering plane.

[DESIGNED BY B. C. PITTMAN]


ATTENTION SQUADRON COs!

Does Each of Your Pilots Know

TECHNICAL ORDERS AND NOTES

Applying to Your EQUIPMENT?

▶ *BuAER COMMENT*—This is not a new idea. There are all types and designs of tow bars manufactured for various aircraft by station and squadron personnel to suit their particular requirements. This design is unique since it has such universal application. It can be used to tow at least 15

PERMITS BACKING WITHOUT DAMAGING PLANE

different models. It is simple to build, inexpensive, and can be used with many different aircraft. Big disadvantage is that bars are not braced or reinforced. Hence, when making a sharp turn compression bar tends to buckle and bend.

(For more on tow bars, see NANEWS *3/15/45, p. 52, and 5/1/45, p. 16.)*

PBY Fuel Tank Sump Repair

Plan Saves 65% Man-Hours

NAS, JACKSONVILLE—An excellent method of repairing PBY fuel tank sumps without removal of wings has been devised here by a leadingman, aviation metalsmith. Procedure consists of cutting four access holes in

SUMP AND FAIRING ARE REMOVED FROM TOWER

tower, partially removing tower fairing —instead of removing wing and engines —and manufacturing special bucking bars for riveting of sump.

This procedure has saved 65 percent of man-hours formerly required. Jobs now average 300 man-hours; nearly 850 were required when wings had to be removed. About 5,500 man-hours were saved in a recent 30-day period on 10 fuel sump repairs when this new method was used.

NEW PROCEDURE EFFECTS SAVING IN MAN-HOURS

DETAILS

1. Drain and ventilate fuel tank in accordance with instructions in Chapter 16-204 of BuAer Manual.
2. Remove port and/or starboard trailing edge, depending on which sump needs repair. This is necessary to drive six rivets at rear of sump.
3. Remove fairing (Part Nos. 28B1005-14, -15, -16, -17, -18, -19) and rear fairing bulkhead (Part Nos. 281506 and -1).
4. Remove or lower sump by drilling rivet heads off inside tank and lowering sump through opening shown in photograph.
5. Cut four access holes between superstructure frames. [See note below.] Attach backing plates with 6-32 aluminum alloy anchor nuts and manufacture plates to match. These access holes enable workman, inside tower, to guide rivet bucking bar being held by man outside bucking rivets behind sump.

BUCKING BARS ARE REQUIRED TO RIVET SUMP

6. Clean out, reseal sump, bolt in place, rivet.
7. After completion of riveting and testing, armor plate is installed and fairing bulkhead No. 28B1506 and skin are riveted in place.

NOTE: In order to reduce high stress concentration and tendency for skin cracks to begin at the corners, one-piece backing strips with generous corner radii and closer rivet spacing should be used at access holes. Similar radii should be used in the skin cutout.

[DEVISED BY A. A. ANDERSON]

New Jig to Remove Bearings

Lessens Probability of Damage

NAS, ST. LOUIS—Some difficulty has been experienced at this activity in removing the K8A Rudder Pedal Bearing due to the fact that, while removing, the fitting would be bent. The method previously used for removal of these bearings was slow and arduous, and results were not too satisfactory.

To speed up removal, a simple jig was designed which not only facilitates the process by removing and reinstalling both at same time, but reduces possibility of damaging fitting to minimum.

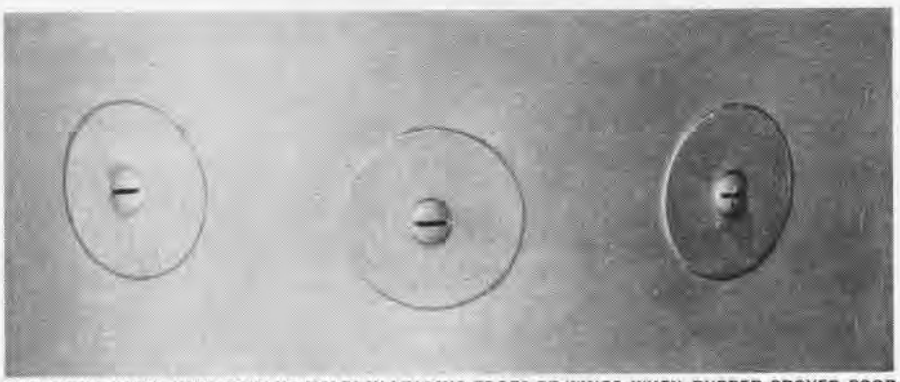
[DESIGNED BY W. H. GRAYSON, AMM2c]

Disks Used to Plug Holes

Grommets Continually Came Out

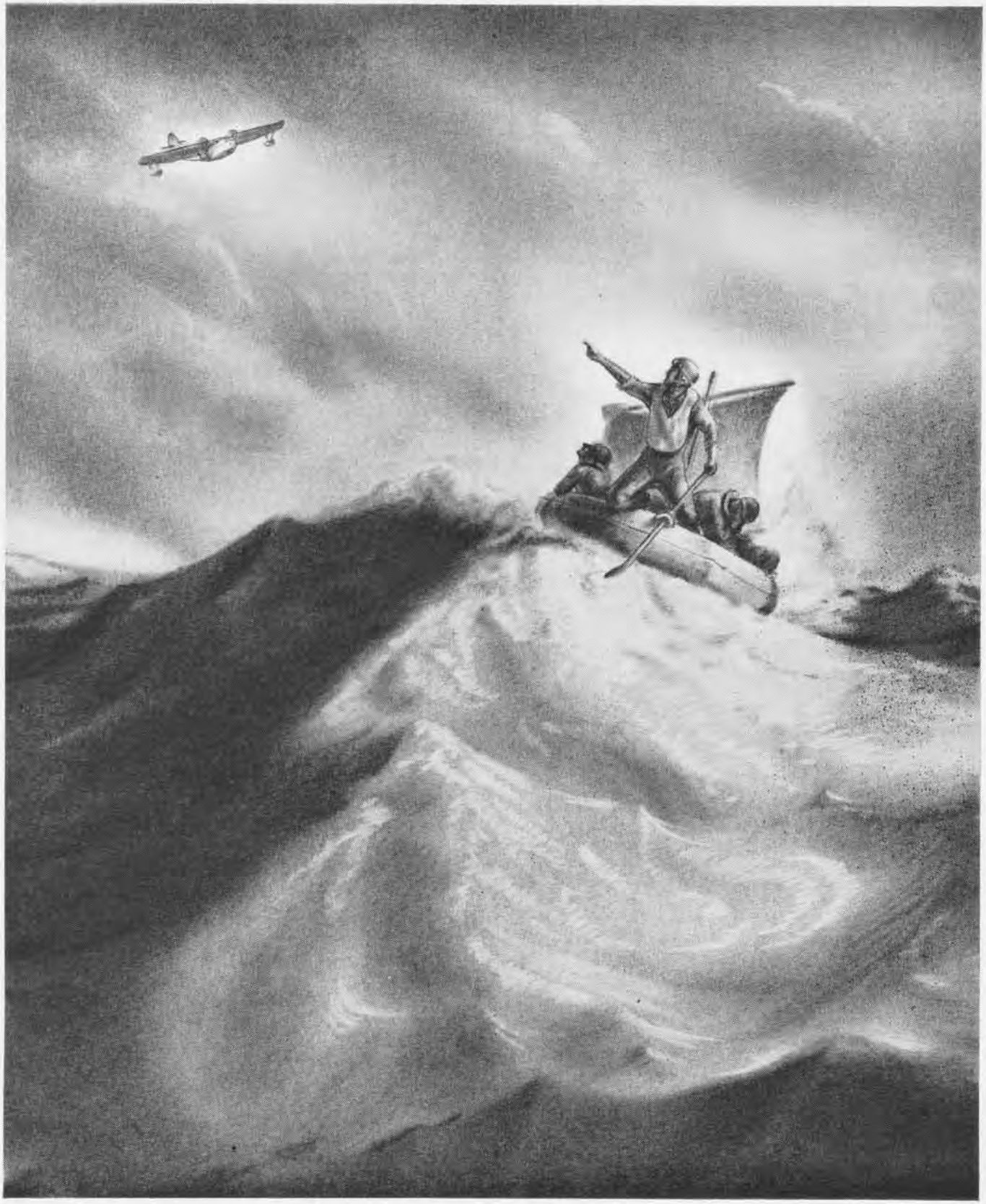
FLEET AIR WING—Upon removing de-icer boots, headquarters squadron of this wing had some difficulty in satisfactorily plugging up the holes in the leading edges. The usual rubber grommets were continually coming out at high speeds. Final solution of the problem was found by using a disk formed to the curvature of the leading edge of .032 24 s. t. aluminum alloy heat-treated and attaching it with a $\frac{5}{16}$-inch U. S. E. loktite screw.

▶ *BuAER COMMENT*—The use of a toggle nut and cover plate is an excellent alternative for the grommets normally employed. It is believed that this information will be helpful to all squadrons that are now operating high performance airplanes.



ALUMINUM DISKS USED TO PLUG HOLES IN LEADING EDGES OF WINGS WHEN RUBBER PROVED POOR

TOGGLE NUT AND COVER PLATE PROVE EXCELLENT SUBSTITUTE FOR GROMMETS IN DE-ICING WING



PBY RESCUE MISSION

NAVY'S FLYING BOAT IS CONSTANT AND DEPENDABLE SAVER OF LIVES

RUGGED CONSTRUCTION, seaworthiness, range have made the PBY vital to naval aviation on missions of patrol and search. To pilots and aircrews adrift on the open sea, there is no more heartening sight than the flying boat when it arrives in response to distress signal.

VISIBILITY OF RAFT AND ACCESSORIES

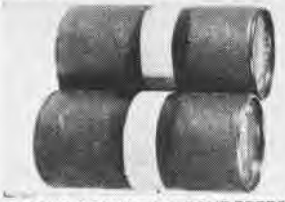
FLEET AIR WING FOURTEEN recently conducted tests on life rafts and signaling equipment to determine maximum distances and altitudes at which rafts, sea markers, reflectors, sails, Very's shells and smoke grenades are visible from the air. Results of these tests are plotted on the accompanying chart.

Above 700 feet LIFE RAFT VISIBILITY decreases very rapidly, so much so that at 2,000 to 2,500 feet the rafts were not acutely visible beyond one-half mile. Binoculars were found to be of limited use for locating a life raft from the air and should be used sparingly. Under competitive conditions, the raft was sighted first by the naked eye in 87 percent of the trials. Many vital secondary clues, such as flash of a reflector, puff of smoke or sunlight flashing on sea marker dye will attract the eye although sight may not be directed in the exact direction. (Binoculars channel the vision too precisely and eliminate side vision.) Binoculars were, however, used very satisfactorily for identification once the original sighting was made.

The small CHROMIUM PLATED STEEL REFLECTOR supplied with each raft and used in accordance with the procedure recommended on pages 44 and 45 of NANEWS No. 187 (2/1/43, then BUAER NEWS LETTER) proved to be the most effective means of attracting attention, being visible 15 to 18 miles. Personnel in the rafts, however, experienced difficulty in using the reflector to attract the plane owing to rough sea and pitching of the raft while trying to maintain the delicate angle for reflection. [Editor's note: The tempered glass signaling mirror, NANEWS, 11/1/43, p. 31, is replacing the steel.]

NAVY MARKER DESIGNED FOR PILOTS

DYE IS SEEN FROM HIGH ALTITUDES



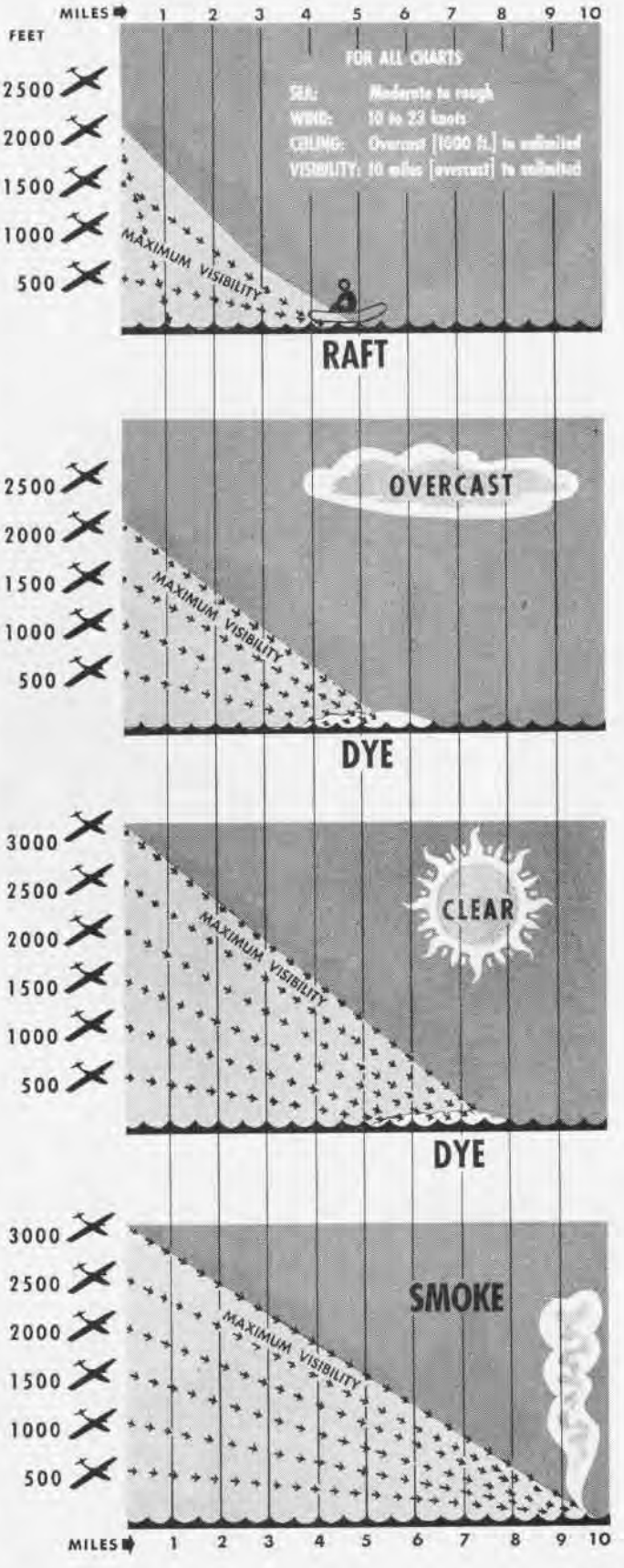
SMOKE GRENADES PROVE EFFECTIVE

KIT HOLDS SHELLS AND PROJECTOR

It was found that the color of the sail does not make any appreciable difference in sighting raft from an airplane. Shape and outline of raft are distinguishable long before color begins to be discernible. Yellow and white attract attention before other colors.

During daylight, VERY'S SHELLS were ineffective in attracting attention.

White smoke produced by the SMOKE GRENADE proved very effective at all altitudes, although maximum *visibility* was much less than had been anticipated.



Fleet Air Wing Fourteen also conducted tests on Rate of Drift of life rafts. Drift of individual rafts under specific load or sail conditions varied slightly from reading to reading with constant wind conditions. Inasmuch as all rafts under specific load or sail conditions behaved similarly as to drift, an average drift bar was included in the graph. It is believed that for any size raft this average figure can be used for computations without appreciable error.

From a comparison of results of previous drift tests it was evident that Rate of Drift is considerably dependent on condition of the sea, but only as to *calm* or *rough* sea. Drifts in rough sea were approximately 50 percent less than those in calm water. In rough water, exhaustive drift readings were taken with winds from 10 to 23 knots with same rafts and load conditions; but results obtained were consistent when drift was measured in percent of wind strength.

BuAer is preparing a manual, similar to *Dunking Sense*, containing information on raft performance and use of the various items of raft equipment. Suggestions for material on this manual will be appreciated.

PILOTS forced down at sea are practically invisible in rough water; this picture was taken from 100 feet

BRILLIANT yellow circle begins to form a few seconds after pilot pulls tab on his life jacket dye marker

THREE minutes after pilot pulls tab, dye has spread over wide area; flier may be seen from great heights

PATROL plane sights downed pilot and radios position to surface ship; life boat is sent to pick up flier

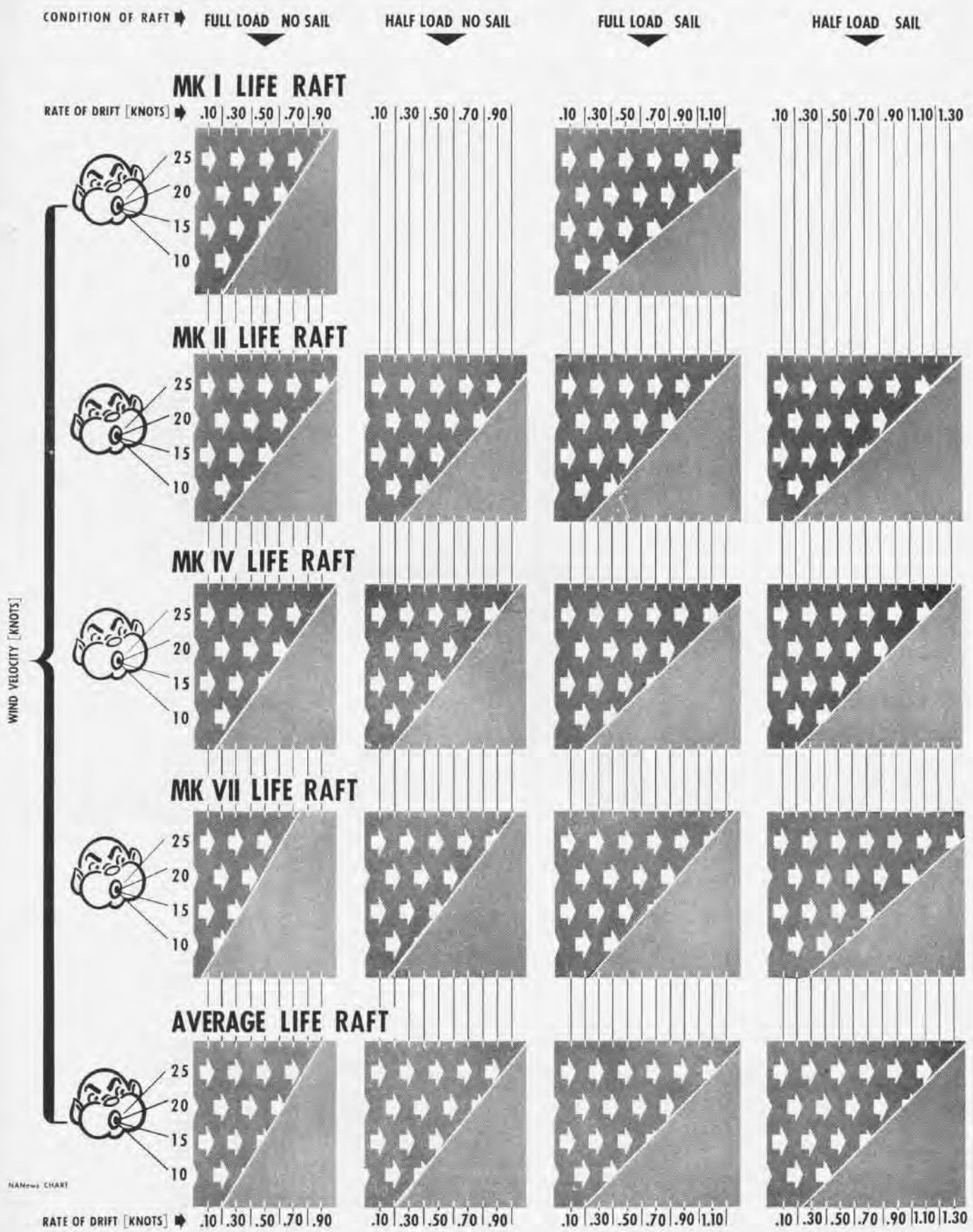
SEA DYE SPEEDS RESCUE OF FORCED DOWN FLIERS

Sea Marker Dye is not effective at low altitudes, but becomes increasingly apparent above 900 feet. If sufficient altitude is maintained in search to observe the dye effectively, it is doubtful if the raft would be located unless it was in or near the dye slick. This fact prompts the suggestion that searches for raft believed equipped with sea markers should be conducted with two-plane units, one plane to fly at 2,000 to 3,000 feet, the other at 500 feet, thereby covering an area thoroughly (one plane sighting the raft, the other the dye). Polaroid glasses should be worn for search under overcast conditions, as they bring out sea marker dye color which is not readily distinguishable to the naked eye under these conditions.

Life Jacket Dye Markers, Navy Aeronautical Specification M-566, were attached to the raft and allowed to stream astern. It was found that each package lasted approximately 45 minutes before being exhausted, and that the dye trail remained clearly visible for about seven hours. By keeping a dye marker streaming when friendly planes are in the vicinity, a raft materially increases its chances of being sighted, assuring that a plane sighting the dye trail will follow it to its source.

LIFE RAFT DRIFT

During tests, load and sail varied as shown under "raft conditions." The sea was moderate to rough, and wind ranged from 10 to 25 knots. Emergency equipment container streamed at all times.



ANSWERS TO DEAD RECKONING AND CELESTIAL NAVIGATION PROBLEM

1. 59°—23′
2. 10 mi. away
3. 039°
4. 19°—46′
5. 23 mi. to
6. 060°
7. Lat. 28°—55′ S
   Long. 158°—26′ E
8. 46°—20′
9. 15 mi. to
10. 107°
11. + 39′
12. 49°—06′
13. 32 mi. away
14. 269°
15. Lat. 26°—59′ N
    Long. 172°—30′ W

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

(See page 19)

Lighting Night Landings

Portable Equipment Serves NAS

NAS, CORPUS CHRISTI—A highly successful trial use of combat type portable field lighting equipment supplied by the Bureau of Aeronautics was recently conducted at this station.

During actual operations, five planes made a number of take-offs and landings. An inexperienced crew set up the equipment in one hour and forty-five minutes and dismantled it in about an hour.

Equipment provides obstacle lights, approach lights, and running lights for a main runway and an alternate runway, the entire lighted area being approximately 5,200 feet long and 400 feet wide. Power for the equipment is provided by gasoline engine operating a generator which produced 500 watts, 110 volts. The amount of illumination may be decreased or increased by rheostat control.

An unusual feature of the equipment is that it may be placed on black-out status and thus become invisible from the air unless a pilot is making a proper approach for a landing. Friendly pilots are guided to this approach by a prearranged secret signal. The black-out condition is created by putting covers over the lights; this may be done within five minutes through use of a Jeep as a conveyance.

Pilots who make landings and take-offs reported that this equipment greatly simplifies the pilot's problems of making night landings. For example, a triple beamed light may be set at the proper angle to guide the pilot in making his approach. A top beam is yellow, a middle beam is green and a bottom one is red to indicate to the pilot that he is too high, in the right path, or too low in making his approach. Contact lights are also colored in such a manner as to guide the pilot, the first pair being red, the next pair green and the rest amber and clear. A pilot knows he is in position to land after he has passed the green lights.

The equipment is extremely compact, all of it stowed in seven moderately sized cases. One of these sets will be kept ready for emergency use on each of the auxiliary air stations.

ANSWERS TO ELECTRICITY QUIZ

on inside back cover

1.4 2.4 3.2 4.3 5.2 6.3

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

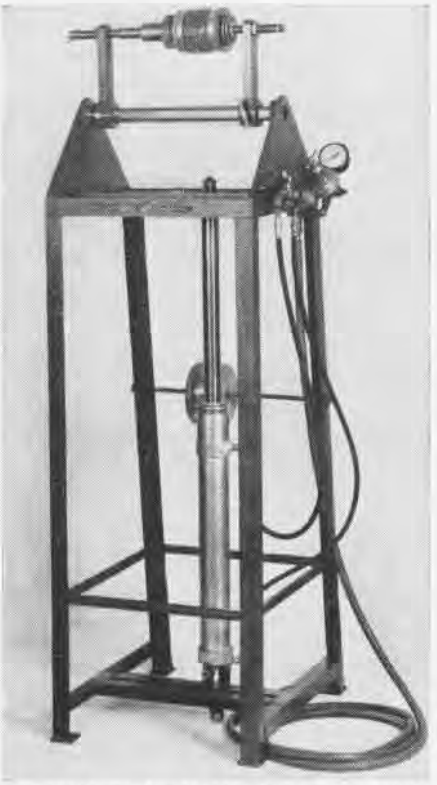
Gas Pier Refuels Seaplanes

Corpus Develops New Method

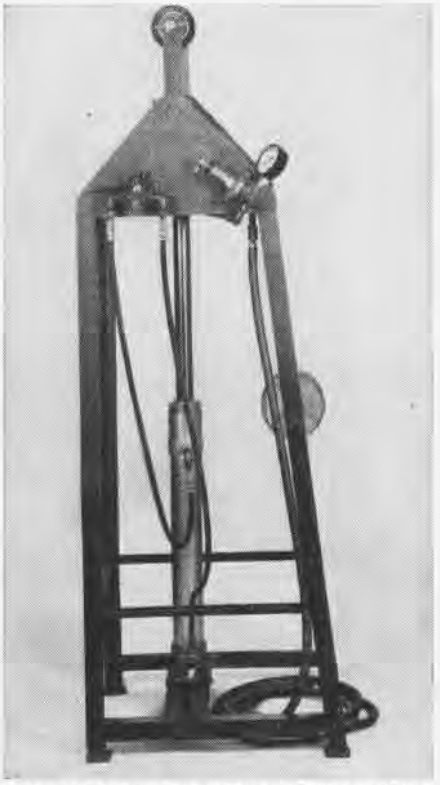
NATC, CORPUS CHRISTI—A new method of gassing-up seaplanes cutting 50 percent off time required has been developed by a VP squadron here.

A gassing pier was extended from the sea wall between the regular ramps. Built in a **T** shape, the pier's crossbar is 40 ft. long and 5 ft. wide, and parallel to the sea wall. The trunk, 45 x 5 ft., is built out from the wall.

Outer edge of the pier is heavily padded so that a plane may be warped alongside and secured for gassing without damaging the hull. Average gassing time was found to be 12 minutes, compared to 25 on the beach.



AIR PRESSURE KEEPS ARMATURE WIRE TIGHT



IMPROVED PNEUMATIC METHOD SPEEDS BANDING

Armature Banding Machine Replaces Old Pressure Device

NAS, ALAMEDA—An air pressure armature banding machine has been designed here to replace a weight pressure device which was slow and unsafe in operation.

The new machine, which is easier, faster and safer to operate than the old one, is square in design with four leg supports. The top is arranged with two adjustable centers made to support the armature while it is banded. The bottom portion has a double acting pressure cylinder. Pressure to this cylinder is controlled by an air regulating valve; also by a four-way double ported valve to give positive control.

The principle of the machine is to keep banding wire tight by means of a constant pressure while banding the armature. A pressure regulating valve enables the machine to maintain various constant pressures.

[DEVELOPED BY C. A. A. HARRIS]

▶ ***BuAER COMMENT***—**This device is a combination of a commercial armature holder installed on the top with a pneumatic tensioning device installed underneath. The idea appears to be ingenious and should be useful in Class (A) overhaul.**

Cargo Net Carries SNJ Tire

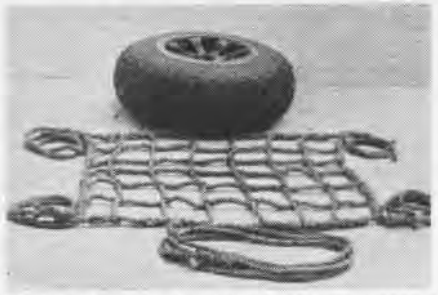
Idea Speeds Up Servicing

NAAS, BRONSON FIELD—To speed servicing of airplanes with flat tires at outlying fields, Chief Aviation Pilot C. L. Haverty, USN, has devised a miniature cargo net to fit tires for SNJ's.

AERIAL TIRE DELIVERY PREVENTS LONG DELAY

This new procedure has reduced the time required to place a plane back in service from two and a half hours to 30 minutes.

An N2s is used as the service plane, with tire in net lashed under fuselage



CARGO NET SECURES SPARE FOR TRANSPORT

and tied to wheel struts and forward flying wires. A small tool box and set of chocks may be carried in the N2s baggage compartment.

The net measures 24 x 36 inches with 3½-inch meshes. Corner lines are extended beyond the size of the net to produce two 36-inch lines on each corner for securing. A 20-foot line is provided for securing the wheel to the net when it is suspended under the fuselage. This is done by reeving the line through the wheel, around the tire through the net. This line acts as chafing gear when the net is brought up snug against bottom of the fuselage and secured. In making the net, 21-thread line is used.

A&R Boosts Its Production

Assembly Line Nets Advantages

NATC, CORPUS CHRISTI—The A&R engine overhaul division here boosted its production 58 percent in 3 months, mainly by abolishing sub-assembly shops and creating a single main-line assembly.

Previously engines were being built up in sections, in a series of assembly jobs. All operations now are handled by one main line under the new set-up, with 18 bays each doing one operation.

Primary advantages of this line are that it allows use of inexperienced personnel, maintains an even flow of production, permits better supervision of workers, and reduces costs of overhaul.

The line also allows use of female workers to a great extent, about 70 percent of those at present being women. Plans are under way to put other shops, including spark plug, carburetor, magneto and pistons, on a similar, efficient production-line basis.

TOKYO TALKS

—To LATIN AMERICA

"Under the deceiving motto of pan-Americanism, the Americans have succeeded in bringing all the nations of Central America and the Caribbean, as well as Brazil, into the war," an action which, together with the breaking off of relations with Japan by South American republics, excluding Argentina, Tokyo calls a "desolating picture of Yankee imperialism."

—To U. S.

The U. S. is asked "to prove your oft-expressed regard for the Filipinos by refraining from attempting to reintroduce the horrors of war into the Philippines. Gone forever are the days when the Filipinos under American rule wasted much of their time in political arguments."

—To EAST ASIA

The war ministry has relieved Maj. Gen. Nakao Yahagi, chief of the Jap army press section, as a result of propaganda blunders. His most recent error was an appeal to China to make peace and a prediction of a "sweeping offensive operation" by Japan at a time when Allied forces were surging forward in the South Pacific. Yahagi recently declared that "Japanese forces are now preparing for sweeping offensive operations." Since then the Japs have lost Salamaua, Lae, and Finschhafen, have been driven back in the Solomons, and have suffered numerous sea and aerial assaults. Another casualty in Jap propaganda ranks in recent months was Lt. Col. Iwasaki whose accounts of the Yangtze River campaign, which ended far from successfully for Japan, were so glowing that the home front was led to believe that the capture of Chungking was imminent.

—To PHILIPPINE ISLANDS

Concerning the U. S. and Britain, Tokyo Radio is quoted as saying: "No political maneuver, no military or economic pressure, and no form of coercion, however extreme, have been beyond the scruples of these predatory powers in their dealings with smaller nations. Japan had long and patiently endeavored to secure the stability of East Asia by peaceful measures, but on Dec. 8, 1941, all these efforts were exhausted and at last Japan was compelled to rise in arms."

—To SOUTH AMERICA

Reports of American-born Japanese fighting in the American forces in Italy and the Southwest Pacific are merely "confessions on the part of Washington that the U. S. troops refuse to bear the brunt of battle when fighting is intense."

—To INDIA

"The proclamation of independence of the Philippines is a message of hope and cheer to the Indian people who are fighting the British for freedom. India, too, will soon gain its own independence."

LETTERS

SIRS:

If possible, I would like monthly copies of NAVAL AVIATION NEWS sent to me at the above address.

The magazine is exceedingly interesting to all of us, but, unfortunately, we can rarely find a copy of it each month.

AMM3/c

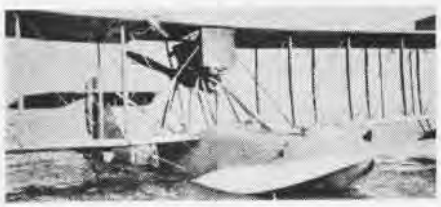
NAS, Seattle

¶ Sorry, but NANEWS does not, as a matter of policy, address copies to individuals. NAS Seattle receives what is believed to be an adequate number of copies of each issue for distribution among all naval aviation personnel. Officers and enlisted men who do not see copies regularly should make it known to the distribution officer. If the quota sent is inadequate, request for an increase should be forwarded by him to NANEWS.

SIRS:

Being interested in the photo of the NC-1 in the column "25 Years Ago This

Month" of the October 15 issue of NANEWS, I enclose a companion photo



taken at the same time and same place; also one of the HS-2. These, too, may be of interest.

H. L. DONALDSON, AMM3/c
NAAS Material Office

Green Cove Springs, Fla.

SIRS:

We regularly receive copies of NANEWS which we all like very much. The income tax story in the September 1 issue was enlightening no end.

LT. (JG), *USNR*

NPFS, Iowa City, Iowa

BEST ANSWERS
to questions on page 11

1.d 2.c 3.b 4.a 5.c

SIRS:

Just a note to congratulate you. Have talked to a good number of pilots and persons interested in naval aviation in some of these far-off bases. They all agree that NANEWS is a pretty fine publication. The acid test to which it is put—and to which I can swear—is that when the boys are sitting around having a few, they pick up the old News Letter and favorably talk of the items mentioned.

The new title [NAVAL AVIATION NEWS] is one which I am sure we all agree is a not unfavorable one. In fact, I think it an improvement. Again let me say, the fellows like it; congratulations!

LT. (JG), *USNR*

Navy No. 140

P. S.—Absolutely unsolicited.

¶ NANEWS appreciates this expression of opinion and trusts it holds equally true when the boys are sitting around NOT having a few.

SIRS:

I understand that it is possible to get subscriptions to NANEWS. If so, will you enter my name and bill me?

SEAMAN 2/c
NATTC, AM

Navy Pier, Chicago, Ill.

¶ Sorry, it is not the policy of NANEWS to address copies to individuals. A supply of each issue is sent to NATTC, Navy Pier. There's no charge.

SIRS:

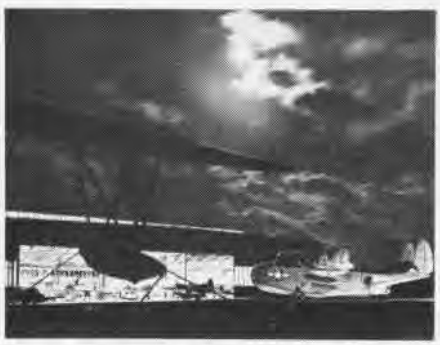
War Savings Bond purchases on this station are now being made at a rate of over $2,500,000 annually. Participation by civilian employees in the payroll savings plan is now over 95%, by officers and enlisted men 91%, and cash sales are gradually increasing in spite of the anticipated reduction due to increase in payroll savings pledges. This is due to a well-planned campaign to make it more convenient for personnel to buy bonds on the station. At a recent noon meeting in our public works dept., $13,100 worth of bonds were sold.

COMMANDING OFFICER

NAS, Navy No. 128

SIRS:

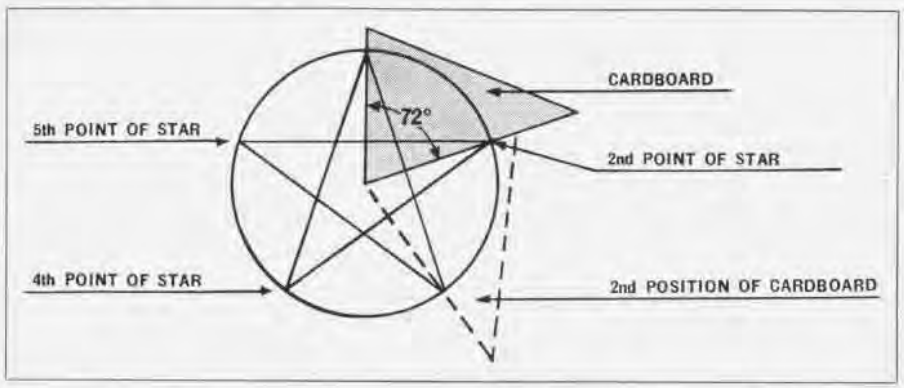
Lugging his camera around the station one night, Harold Spicer, PhoM3/c, caught this beautiful shot of a PBM flying boat,



beached like a fat fish in front of a Breezy Point hangar under an autumn moon. Although the hangar doors are open, the lights are shaded so that they shine in, instead of out. To the naked eye, the lights aren't as prominent as they are in the picture, for Spicer used a time exposure.

ENSIGN, *USNR*

NAS, Norfolk



SIRS:

In regard to the suggested construction of templates for the diagram of the star of the new insignia, as illustrated in the October 15 issue of NANEWS, we offer the following method for forming any size star that may be required on various airplanes:

Cut out of a piece of cardboard an angle of 72 degrees, which can be done readily with the aid of a protractor. Place the apex of the angle at the center of the circle with one side of the cardboard passing through the top point of the star. The point of intersection between the other side of the cardboard and the circle is the next point of the star. By moving the angle around, and using the new point and the center of the circle, you are able to find the third point on the circle. After locating all five points, the star is formed in the conventional manner. The diagram illustrates the method.

Our paint shop has used this method with pronounced success.

MARINE SERVICE SQUADRON

MCAS, Mojave

CONTENTS

PUBLISHED TWICE MONTHLY BY AVIATION TRAINING DIVISION, OFFICE OF CHIEF OF NAVAL OPERATIONS AND BUREAU OF AERONAUTICS, NAVY DEPARTMENT—NO. 205