

NAVAL AVIATION

NEWS



Navy Aircrewmen
Jap Camouflage
Survival Hints

Apr. 15, 1944



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JAP CAMOUFLAGE

THE ART of camouflage, more properly labeled a *science*, has given the Jap passion for subterfuge many outlets of expression. In cold terms of defense, it has been the means, at least for limited times, of his protecting planes and ground equipment from detection and bombardment by the Allies. But prying lenses of Navy cameramen, bringing back evidence on film, and sharp analyses by photo interpreters, today form working teams that single out targets from their cover and make them vulnerable to attack.

Jap methods of camouflage, on the whole, have been simple but extremely well executed. Basically, the Japs believe that the secret of successful camouflage lies in harmonizing it with the natural conditions of the terrain,

as a U. S. Army *Intelligence Bulletin* points out. No detail is too slight to consider: shadows and color are important, and any change from the usual is warily avoided.

The devices the Japs use in camouflaging fall into four categories: 1. NATURAL OVERGROWTH, one of the simplest yet most effective sources. 2. NETTING, which breaks up geometrical outlines, such as those created by a plane. 3. PAINT, including razzle-dazzle, fake silhouettes, etc., and 4. DECEPTIVE INSTALLATIONS, usually built out in the open to divert attention from targets that may lie concealed nearby.

Wiliness and native ingenuity characterize the Japanese use of camouflage, and Navy bombers, to strike successfully, must follow trails blazed by photo interpreters.



PRACTICE OF JAPS IS TO HIDE BARGES CLOSE TO SHORE BY COVERING WITH TREE BRANCHES. ALLIES DETECTED, BOMBED AND STRAFED THESE

NATURAL OVERGROWTH GIVES JAPS NEAREST SOURCE OF CAMOUFLAGE

THE SIMPLEST CAMOUFLAGE procedure used by the Japs consists in covering objects with branches of trees and various types of overgrowth. This also is the quickest and most economical method, as nature insures an abundance of disguising material within easy reach. The important principle emphasized is that the illusion of reality from the air must be preserved. Thus, barges close to shore may be covered with branches of trees to make them resemble a continuation of the tree-fringed shore, as in the picture above.

Natural camouflage is made to conform in size and texture to its surroundings. A hillside position taken by Jap soldiers may be shielded by pussywillow branches, draped with moss and grass to hide openings. Narrow slits left in revetments for observation and firing are hidden with tufts of grass. Whenever the Japs dig into ground, grasses and weeds dug up are stored for future camouflage use.

The Japs usually build their cooking, storage and bath facilities by cutting into the sides of hills and banks. These are blended with their surroundings by coverings of grass, branches and turf. Office buildings, barracks, officer quarters, radio installations, hospitals, built into the ground with only the roof visible, are systematically covered with grass sod which, besides helping to camouflage, acts also to shed rain and to cushion shocks from Allied shell fragments.



Overgrowth strung across Jap plane aids combustion as Allied bombers kindle pyre



Low oblique taken by Navy cameraman shows details of camouflage entwining Jap plane



Grass sod covering plane revetment helps to blend it with immediate surroundings

NETTING EVENS JAGGED SHAPE OF PLANES PARKED ON GROUND

A NATION so determined upon war as the Japanese, possessed the fertile mind in which ideas for developing military tactics, including defensive use of camouflage, naturally would flourish. Drafting the blueprint for war, the enemy pressed forward in his plans for military expansion, probing and polishing smallest details that at the time, in pacifist circles, would provoke indulgent smiles. How careful the Jap has been to exploit and add to every natural advantage comes to light in a study of his camouflage techniques used in areas captured by the Yanks.

Wherever possible, the Jap employs the camouflage afforded by nature to protect planes and equipment from detection by the Allies. Under trees and dense foliage, for example, he will park planes and build huts, barracks and installations. But when planes and construction have to be in the open, man-made forms of camouflage and deceptive devices are employed to blend the target with surroundings.

The Japs frequently have used netting interwoven with strips of cloth to break up geometrical outlines, such as a plane's, and throw confusing shadows, making the object less conspicuous from the air. In jungle areas, the Japs use netting extensively to disguise personnel, weapons, installations, horses and mules. Meticulous care is taken to arrange nets to conform with contour of land, thus divert suspicion.



Netting strewn over plane and adjacent hut soften irregular feature of objects, harmonizing them with nearby overgrowth



EFFECT OF NETTING INTERWOVEN WITH STRIPS OF CLOTH IS TO BREAK UP GEOMETRICAL OUTLINE, MAKING OBJECT LESS CONSPICUOUS FROM AIR



Paint on rooftops, used in open positions such as this, breaks solid masses into lights and darks to resemble natural objects



Silhouettes of planes have been painted on runway to confuse Allied bombers and divert their attacks from genuine targets

FAKE GUNS AND DUMMY PLANES ARE HOLLOW JAPANESE JOKES

FAKE gun installations made of a palm tree trunk and a few sandbags is an effort to mislead Allied attacking forces, and is reminiscent of similar measures taken by the Nazis. These positions sometimes are built out in the open, begging for attention, while concealing actual gun positions situated nearby. Also in vogue with the enemy are complete emplacements, strewn wire, wooden guns and straw men made by stuffing dry grass into uniforms. Just as typical is the dummy plane, or the useless damaged plane, situated in an exposed position to attract aerial bombing in order to divert aerial attacks from actual planes hidden nearby.

Combining artificial with natural camouflage devices, the Jap was able to gain a certain initial advantage in warding off attacks from the air. But that his precautions have not been sufficient to stave off the inevitable American advance into the Japanese bailiwick has been proved, and is being proved, in operations of the combined Pacific forces. Photo interpreters take the lead in estimating Jap defenses.

PAINT IS DECEPTIVE, BUT NOT TO NAVY'S AERIAL CAMERAMEN

USE OF DIFFERENT colored paints to deceive the eye by breaking up the contour of geometrical shapes is sometimes wholly effective as far as the observer is concerned, but Navy's aerial cameras have successfully penetrated these camouflage devices. Shadows of buildings remain intact, and from these the actual shape of the disguised object can be gauged. In the case of plane silhouettes painted on parking strips (*see picture*), absence of shadow betrays the fact that no actual planes are present on the runway.

In using paint to camouflage objects, the Jap attempts to approximate as nearly as possible the predominant colors of the terrain, then paint objects somewhat darker.

To help in the task of unmasking the enemy's targets by photography, the photo interpreter can get a three-dimensional picture of the ground area by viewing stereo pairs of prints through a stereoscope. Thus he separates the object from the illusion. The ingenuity of the Navy's photographers and interpreters counters Jap camouflage efforts.



Japs were painstaking in efforts to deceive invader with log set up to resemble gun emplacement. Note encircling revetment



Ignoring no detail, Japs had painted this fake gun gray and bored end, angling its position to resemble gun emplacement

GRAMPAW PETTIBONE

Do It Right


While coming in for a normal landing in an SNV-1, a student allowed his air speed to become dangerously slow and the instructor took over. A hard but safe landing resulted, after which the instructor told the student through the gosport system to take over the controls. The student did not hear the order. With no one at the controls, the airplane suddenly ground-looped, doing damage to the center section.

 *Grampaw Pettibone says:*

The Trouble Board considered the instructor 100 percent to blame (carelessness and poor judgment), and I agree. Of all people, an instructor should certainly know better than to attempt a transfer of controls without receiving proper acknowledgment.

Tower Responsibilities

During night flying operations an F6F on the way out to the take-off position got stalled on the taxi-way with a broken tail wheel. The tower sent out a general warning to all planes stating the F6F's position. At this time, however, a TBF was warming up with the radio not yet turned on. After checking his mags, the TBF pilot began taxiing out to take off. The tower neglected to call him about the F6F and he received no warning of any kind. Due to the darkness of the night and the confusing, flickering light from the smudge pots, he did not see the F6F in time to avoid a collision. One plane received major damage and the other requires replacement of a major part.

 *Grampaw Pettibone says:*

This and other similar reports show that tower operators are not yet doing all they can in the way of flight safety. In this instance, the tower certainly should have seen the danger of a collision when the TBF started taxiing and realized that the TBF had not received the first warning. Tower operators are no exception to the



rule in aviation that no one can afford to take anything for granted. Tower personnel should be continually reminded of their responsibility for avoiding accidents. They are in an excellent spot to see actual and potential hazards to personnel and aircraft and must be on the ball all the time in order to take immediate action to forestall them.

There is no intent here to whitewash the TBF pilot; his neck was out a mile. In fact, had he followed the instructions in *Standard Airport Traffic Control Procedures*, no accident would have occurred. This procedure requires a pilot to receive taxi instructions from the tower *before* leaving the line. Had he done this, he would have got a check on his radio and, at the same time, a warning on the stalled F6F.

Air Discipline

In response to the current drive for stricter enforcement of air discipline in basic and intermediate squadrons, the Naval Auxiliary Air Station, Saufley Field, Pensacola, is using a new method for handling course-rule violators and potential Dilberts.

Supplementing the disciplinary action, all offenders are now grounded, placed on several days of tower duty where they must stand watch and record all course rule violations about the field. At the end of each period, they personally report these violations to the Chief Flight Instructor's office.

Whether through pride or ignorance, basic students are all reluctant to go around again after starting an approach. They seem to feel that no matter what they're told, once begun, an approach must be finished in spite of results. On the landing mat where 200 SNV trainers are landing in 20 minutes, one every

six seconds, minor infractions of discipline such as S-turning to a runway, landing long, landing close behind another plane or cutting other planes out, though seemingly insignificant, can form bad habits and cause serious accidents.

Telling a student this before, during, and after flights has never proved sufficient. Now, together, with disciplinary action, the "Tower Watch" seems to completely subdue the violators.

Radio Altimeter

After having been in the air approximately one-half hour on a night low-level bombing practice flight, a TBF pilot flew into the water while making a run on the target. Investigation disclosed that the radio altimeter evidently had not been turned on at any time during the flight.



► *COMMENT*—If the radio altimeter had been used during the flight, the pilot would have known his absolute altitude and would have been able to avoid flying into the water. The radio altimeter should always be used in all low-level flying operations between 0 and 4,000 feet, as the barometric (Kollsman Sensitive Altimeter) may be several hundred feet in error.

Who Wakes the Bugler?

Have you heard the story about the naval air station that developed an *almost* perfect solution for preventing wheels-up landings? A man was stationed at each field not operated under radio control. He was equipped with signal flags and had orders to give a "wave-off" to any plane attempting to land with wheels up.

The only trouble was that the system wouldn't work until the signalman got there and he had to be flown in. You guessed it!—The instructor who flew in the first signalman didn't have anyone to warn him, so he landed wheels up.



A&R SHOPS

LET NANNEWS
HEAR
FROM YOU!

Downdrafts to Leeward!

While flying at 800 feet in the lee of a 3,800-foot peak on Chyginadok Island, Alaska, the pilot of an OS2N-I suddenly noticed a rapid loss of altitude. He immediately turned away from the cliff and applied full throttle,



but continued to lose altitude and finally mushed into the ground in a climbing attitude. Wind force in the clear was approximately 20 knots.

Grampaw Pettibone says:

While the natural phenomenon of downdrafts to leeward of obstructions isn't limited to Alaska, downdrafts are particularly vicious in that area and so Alaskan pilots soon learn to stay away from the lee side of all hills, cliffs, peaks, etc.

Maybe this pilot was new up there and didn't quite believe downdrafts were as dangerous as he had been told. Of course he knows better now, but you can't afford to expend a plane every time to convince a pilot that a certain flight maneuver is dangerous. Another reason you can't use the personal test method on flight hazards of this sort is that too often the pilot doesn't live to profit by his experience. Some things you have got to learn synthetically—from the unfortunate experiences of others.

Ejected Cartridge Cases

Cartridge cases ejected from the plane ahead recently caused a forced landing in an F3A-1. A cartridge case ruptured the oil cooler, resulting in loss of oil and subsequent piston seizure and complete engine failure.

► **COMMENT**—This type of accident may occur to planes which follow too closely behind and below aircraft which are firing. Damage varies from cracked windshields and damaged wings or fairing surfaces to complete engine or propeller failures. Damage increases with higher caliber guns.

Projects are now under way to collect empty cartridge cases in flight from all except fixed gun installations.

Careless Pedestrians

An instructor was recently walking diagonally across a taxi strip in such a manner that his back was toward planes taxiing out to the take-off position. An N2S, with an instructor and student aboard, taxied down the strip at a moderate speed making prescribed S turns. Neither occupant of the plane saw the pedestrian at any time since his direction and path across the strip coincided

with the airplane's right swing during an S turn. The pedestrian remained in the plane's blind spot and apparently was not aware of any danger until struck by the propeller and killed.

Grampaw Pettibone says:

This accident was due mainly to carelessness of the pedestrian. Propeller casualties such as this will continue to occur until everyone learns to respect a taxiing plane. It makes no difference what your rank may be or what you rate around the station, everybody rates the same around a moving propeller.

The following technique may save you from a similar accident, but it isn't guaranteed unless you also keep your eyes open and look around:

ALWAYS CROSS A TAXIWAY AT RIGHT ANGLES SO YOUR BACK IS NEVER TURNED TOWARD A TAXIING AIRCRAFT.

Err on the Safe Side

During primary night flying, a student, upon receipt of the proper light, came in for a normal landing just inside the port line of flare pots. His left wing narrowly missed the floodlight officer and struck a crewman who was picking up used Very's ammunition. The investigating board was of the opinion that the student pilot obeyed all the instructions and signals and that the responsibility for the accident was entirely that of the floodlight officer and his assistants in being too close to the runway in use.

► **COMMENT**—The Trouble Board recommended stricter compliance with existing CNAPT directives regarding location of personnel and equipment during night flying operations. This case is cited in order that other night flight duty officers may avoid similar errors.

Two Ways to Do Everything

An experienced pilot, recently returned from the Fleet, took off in an F6F as leader of a two-plane section. At about 150 feet altitude he suddenly



entered a thin overcast. He immediately tried to get back down, but in so doing, he either lost control or broke out of the overcast with insufficient altitude to recover, and crashed.

The wingman took off 25 seconds after the leader, flew into the same



overcast and immediately went on instruments. He broke out on top at 400 feet and later landed at another airport.

Grampaw Pettibone says:

In aviation, the difference between doing a thing right or doing it wrong often ends up like this.

With regard to your instrument flying ability, remember that little instrument qualification card in your pocket won't fly the plane for you when you find yourself in the soup. You do the flying, so you gotta keep in practice. Another thing—when visibility is low and you are operating from a field with no obstructions ahead, don't try to maneuver immediately after take-off. Go "on instruments" and keep everything steady. Climb straight ahead until you break out on top, or until you reach a safe altitude. See *Flight Safety Bulletin No. 3-44*.

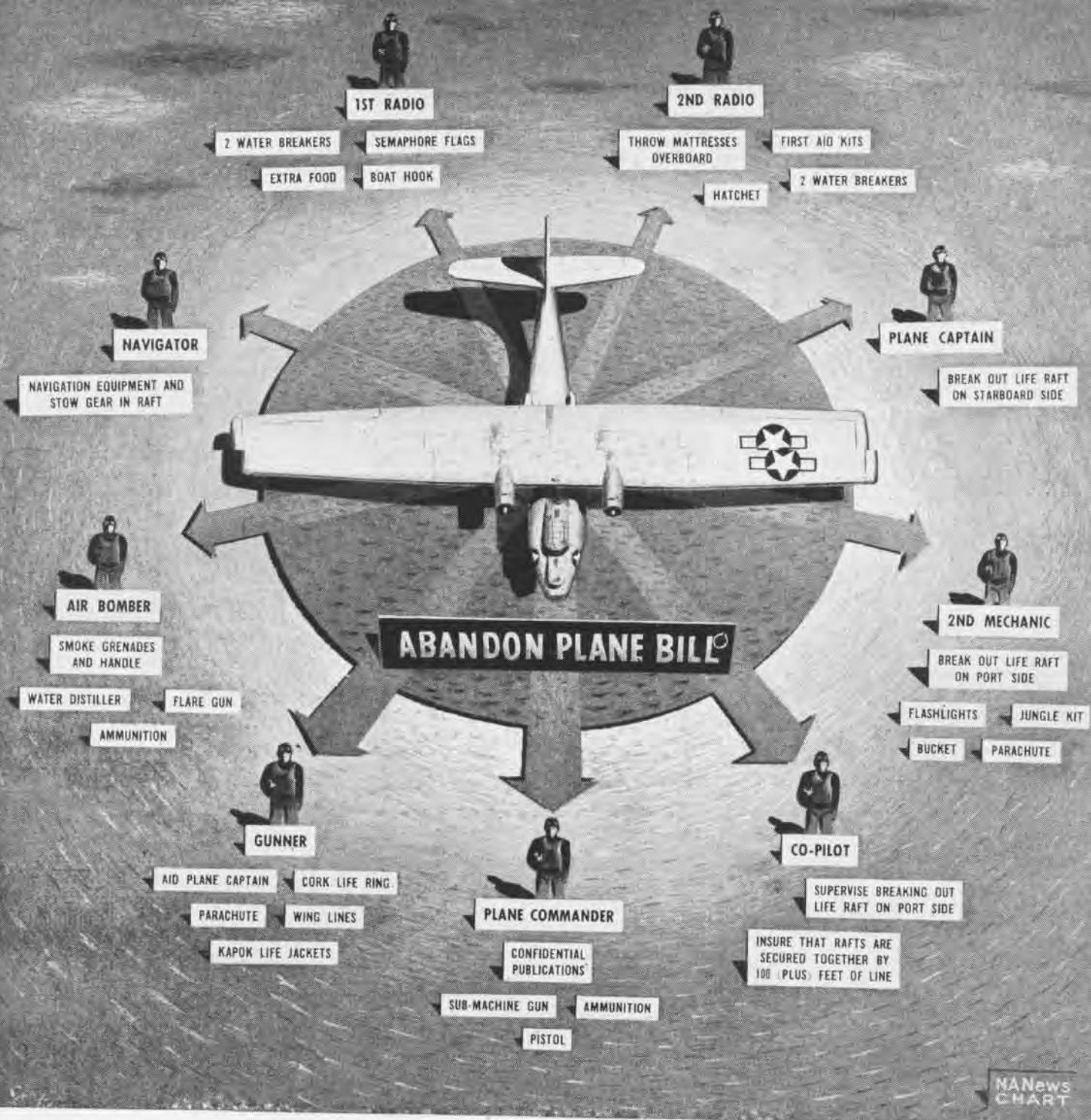
Gremlins Plus Dilbert

Some folks say Gremlins were responsible—others are not so sure—but it is certain that whoever or whatever was to blame, the accidents involving a certain Marine group's R50 were serious enough to put the transport out of commission for nearly half a month.

Here's what happened. First, the R50 was in the middle of a 30-hour check. Standing nearby in the hangar was a 30-foot scaffolding. Outside the hangar was a TBF. Rube Goldberg himself couldn't have designed a more perfect setup for trouble. The TBF was warmed up. The slip stream swept through the hangar doors and toppled the scaffolding onto the transport plane's wing.

Finally back in commission, the R50 landed at an outlying field. A truck went by. One of the wheels of the truck came off, rolled into the plane and tore a gaping hole in the fuselage. Then, while the plane was being pushed into the A&R shop, Dilbert came along. Possibly a Gremlin suggested to Dilbert that he help the boys in their work. He pushed on the radio antenna. It snapped.

Gremlins or no Gremlins—Dilbert or no Dilbert—the R50 was a big problem to this HedRon for several weeks.



ABANDON PLANE BILL

ALL PATROL UNITS have need for a well-organized abandon plane procedure, varied according to the type and mission but planned in advance so that it may be carried out in an orderly and meticulous manner, should the emergency arise. Impressed with this necessity, a patrol squadron commander issued these recommendations:

1. Devise and maintain an up-to-date, workable abandon plane bill.
2. Standardize stowage of all abandon plane gear in most accessible place in plane.

3. Know your own duties as well as those of other crew members.

4. Know contents of raft, emergency, jungle and first aid kits and have a working knowledge of all gear.

5. Wear a complete uniform, including hat, and life jacket.

6. Stow a 100-ft. coil of 18 thread manila line in raft; also a coil of smaller line to be used in securing loose gear.

7. After manning raft, inventory gear, restow and secure it.

8. Prepare an emergency navigation kit consisting of an air almanac, small navigation book and protractor in a watertight packet as part of gear. (Charts, tables, octant, chronometer, binoculars, compass should be assembled if time permits.)

9. Learn how to rig and sail a life raft.

10. Attempt to reach a definite goal, regardless of distance, to boost morale.

With this advice in mind, the above abandon plane bill was suggested for the *Catalinas* in the squadron. It appears to be complete except for specific ditching stations for landing impact.

WHEN TIME PERMITS, the air bomber and first radioman, under the plane commander's supervision, should destroy all confidential and secret plane equipment including bomb-sight, IFF, radar, bombing data, other radio equipment, frequency charts, etc. Near combat areas, if the plane must be abandoned, be sure that it sinks.

NA News
CHART

DID YOU KNOW?

War Bond Record Is Lauded Seven Stations Lead in Buying

The seven major naval air stations, when the final returns for February in the Navy War Bond program came in, led all other groups with an outstanding 96.5 percent participation of civilian personnel. The Assistant Secretary of the Navy for Air dispatched a congratulatory letter to the commanding officer of each of the stations. His letter follows, in part:

"The over-all Navy bond program is a grand success and is a leader throughout the Nation. The aeronautic organization, on top of this, tops the Navy.

"The February report shows that the air stations have an average percentage of participation figure for civilian personnel of 96.5 and that they are investing 10.7 percent of their pay regularly through the Navy Payroll Savings Plan. The approximate average for these same stations in the bond allotment program is 80 percent of naval personnel.

"It is with a great deal of sincerity that I extend to you and to all personnel at your command my hearty congratulations on the splendid results shown to date."

Pensacola led the air stations with 97 percent of civilian personnel investing

22.6 percent of payroll. Jacksonville was second, with 97.1 percent participation for 18.5 percent of payroll.

Wave Gunnery Instructors Teaching Airmen How to Shoot



WAVES TEACH GUNNERY AT NAVAL AIR STATION

NAS HUTCHINSON—Rating as a full-fledged air gunnery instructor, the first enlisted WAVE has reported at this station to teach airmen how to shoot.

Graduating from NATCEN Pensacola, WAVES are rated as specialists (G) and qualified to shoot pistols, revolvers, and machine guns on the range as well as teach gunnery theory in classrooms and accuracy on synthetic gunnery devices.

During the Pensacola training period, WAVES study ballistics, recognition, sighting, learn to tear down and reassemble machine guns and other subjects relating to aerial gunnery. This knowledge accumulated in gunnery is not to be used in combat but will be passed along to airmen. WAVE instructors will be used principally on synthetic gunnery devices. Outstanding gunnery ability has overcome any reluctance men have had about learning to shoot from women instructors.

New Hospital Ship Afloat Is Navy's Largest Mercy Vessel

The U.S.S. *Refuge*, the Navy's newest, largest and most modern hospital ship, was recently placed in commission at the Maryland Drydock Company. The one-time cargo vessel, luxury liner and troop transport has fixed berths for 630 patients and carries a mobile field hospital comprising 72 cots, a laboratory, x-ray and other equipment.



25 Years ago this month, in April, 1919, the NC-3 and NC-4 were completed. Each was equipped with four high-compression Liberty engines, but the arrangement was slightly different. Two engines were arranged on a center line as a tandem pair, while the other two were mounted on the wings as tractors. A further change was made by omitting the center nacelle—the pilots being placed in cockpits in the hull. With instruments, cooling water and accessories, these planes weighed just under 16,000 lbs., but when fully loaded for a flight of 1,400 miles, weighed 28,000 lbs.



They cruised at 85 mph with capacity load, but increased cruising speed to 95 mph with an average load of 24,000 lbs. Crew members of the NC-3, left, above, were Machinist E. H. Howard, Lt. Brenton Rhodes, Comdr. J. H. Towers, Comdr. H. C. Richardson, Lt. D. H. McCulloch and Lt. Comdr. R. A. Lavender. NC-4 crew members were Lt. Comdr. P. N. L. Bellinger, Lt. Comdr. M. A. Mitscher, Lt. L. T. Barin, Lt. (jg) H. Sadenwater and Chief Machinist C. I. Kesler, all shown from left to right in photos above. Both later made the transatlantic flight.

Wrecked Blimp Is Repaired Fuel Lack Forces Airship Down

The K-68, forced down and wrecked on a waterless, barren Caribbean island while assisting in sinking of a German submarine, is back in service again patrolling for U-boats.

A 10-knot wind threatened to destroy the blimp after it came down for lack of fuel, so it was deflated by releasing the 400,000 cubic feet of gas. A few hours later a salvage party started out to bring it back to its base piecemeal, using a jeep as automotive power.

After numerous trips bringing out smaller equipment, the blimp's car was



WRECKED BLIMP CAR SET TO ROLL TO BEACH

counterbalanced and attached to the jeep so that it could roll toward the salvage beach on its own wheel. There the airship was loaded aboard a net tender and returned to its base for re-assembling.

Rockets Smash Jap Vessel Torpedo Squadron Uses Weapon

First reports of the use of airborne rockets to attack shipping have been received from a Marine torpedo plane squadron in the Rabaul area.

The attackers, flying at 300 mph, dropped into Rabaul harbor from 12,000 feet and made a low broadside approach on a 450-foot cargo ship. Flying through heavy anti-aircraft fire, the pilots fired their wing rockets at the ship, some of them exploding in the water a few feet short. Other rockets and bombs smashed home into the ship.

One pilot reported that coming out of the dive he fired his rockets at the target. "There was a boom, then a swishing sound I could hear over the

engine. A second later I pulled the bomb lever. The rockets and bombs smacked the ship like the old one-two in boxing. The delay on the bombs gave me time to get out of range."

U-Boat Sunk After 27 Hrs. 200 Depth Bombs Are Dropped

Some German submarines die hard, one recently battling several destroyers and escort carrier aircraft in an off-and-on, 27-hour skirmish in which 200 depth charges were dropped before it was destroyed.

Running battle occurred in the Atlantic after sub was sighted by two



SUB BEFORE LAST DIVE, REVEALS MANY GUNS

carrier planes. First depth-charge attack apparently damaged the U-boat but it continued to play hide-and-seek with destroyers and planes until the next day.

Just before it sank, submarine surfaced and crew strafed one destroyer with deck guns while overhead aircraft strafed U-boat. Gunfire from the destroyer finally sank it.

Waves to Be ACI Officers Will Release Men for Sea Duty

WAVES will be trained to replace Air Combat Information officers for sea duty, according to an announcement revealing they would enter at least two classes at the ACI training school at Quonset Point for a two months' course.

Women who complete the training may be assigned to one of the seven ACI centers in the United States. Most of the candidates will come from officers already on duty. A few billets may be available to certain selected new officers after finishing their indoctrination.

BEST ANSWERS

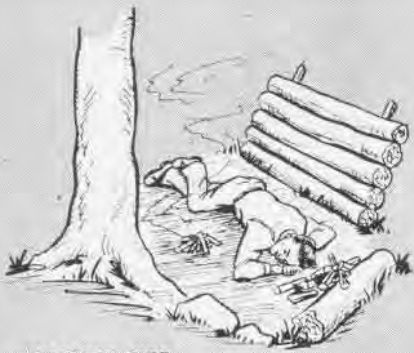
Flying the Weather

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

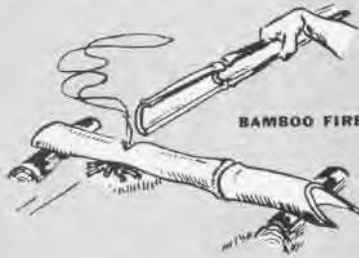
- At low temperatures (0° to 10° F.) in a stratus cloud, the type of ice most likely to form on a plane is—
 - a—glaze (heavy)
 - b—glaze (moderate)
 - c—rime
 - d—frost
- A rapid accumulation of dangerous wing ice is most likely to be formed from—
 - a—large drops of water at about 25° F.
 - b—small droplets at about 20° F.
 - c—supercooled water vapor
 - d—large drops of water at about 35° F.
- The thick fogs frequently encountered by pilots flying near the Grand Banks off the coast of Newfoundland are usually formed—
 - a—on clear, calm nights
 - b—when mT air blows from the south
 - c—when cP air from the continent blows over the Gulf Stream
 - d—when warm moist air is forced aloft
- A pilot is forced to land during early afternoon of a warm summer day on a field in a mountain valley. If winds aloft are very weak, he will be most likely to land into the wind if he approaches the field headed—
 - a—from the east
 - b—up the valley
 - c—down the valley
 - d—across the valley
- If a pilot notices from his strut thermometer as he goes aloft that the rate of temperature decrease is considerably greater than normal, he should expect the air to have—
 - a—stability
 - b—conditional stability
 - c—top-heaviness and instability
 - d—an inversion
- Low ceilings are most often produced by—
 - a—stratocumulus clouds
 - b—cirrostratus clouds
 - c—stratus clouds
 - d—cumulus clouds

FIREMAKING AND COOKING

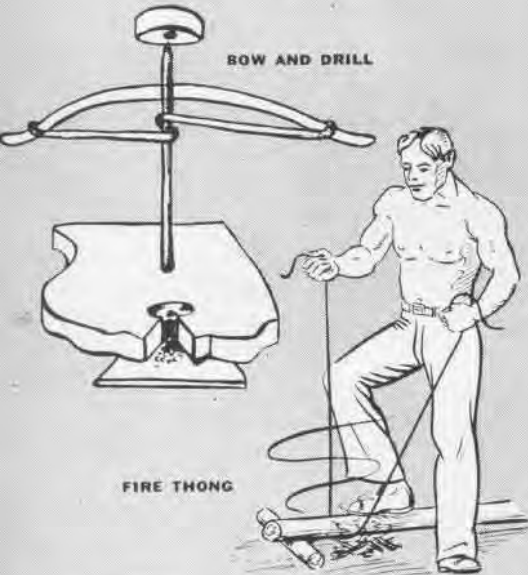
Good living is an art in the wilderness



REFLECTOR FIRE

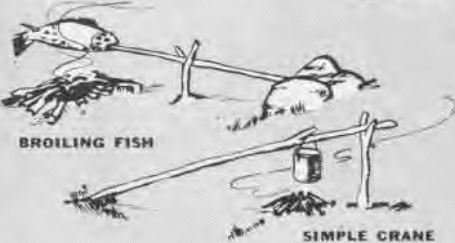


BAMBOO FIRE SAW



BOW AND DRILL

FIRE THONG



BROILING FISH

SIMPLE CRANE



KEEPING WARM

FIRE will enable you to keep warm, cook food and destroy any harmful germs in food and water. With matches you should be able to build a fire under all weather conditions. No one who may have to shift for himself in a remote area should ever be without matches in a waterproof case. If you practice a few basic rules you can always make a fire.

1. Select a dry spot out of the wind and where your fire won't spread
2. Use only the driest tinder to start the fire
3. Have a good supply of kindling on hand before striking a match
4. Start with a tiny fire and add fuel as the flame grows
5. Add fuel sparingly—fire needs air—and blow lightly on the burning wood to help the flame along
6. Use dry dead wood

Tinder may consist of dry grasses or plant stems, dry bark, or dry leaves. The most available tinder in dry weather is the tiny branchlets from dry dead limbs. Twigs not much thicker than a straw should be broken in lengths of several inches and arranged in a wigwam pile 3" to 4" high. Touch a match to these and add kindling as the flames grow. Shaving clusters may be used in place of twigs. Select dry branches the diameter of your finger and shave them halfway through for most of their length to form a cluster of shavings.

In the arctic, dried lichens, moss, heather, scrub willow and driftwood all make good fuel. Seal blubber is the best natural fuel. It can be burned in a shallow stone lamp or tin can with a wick of dry powdered moss, grass or decayed wood. Or soak a small piece of cloth in seal grease. Then place a small pile of dried bones or other non-combustible material on top of the rag. Lay strips of blubber on top of the bones and light the rag which will burn like a wick and start the blubber frying. The blubber oil will trickle down on the bones and flare up as they get hot.

Lubricating oil will not light with a match unless first vaporized by dripping on a piece of hot rock or metal. It can be burned in a container with a wick of rope, cloth, dried bark or moss. If you come down with your plane in the arctic cold, drain your oil before it congeals, mix it with gasoline, pour it into a container and burn it with an improvised wick.

BANK a fire properly if you expect to have it burning the next morning or the next week. Use green logs or the butt of a decayed, punky log for a slow-burning fire. Eliminate as much draft as possible. The coals of the charred backlogs can be blown into a flame when needed. It requires less work to keep a fire going than to start a new one.

The trick of making a fire in wet weather is to find enough dry tinder and wood to get it started. Look for dry wood under overhanging rocks, in caves, on the under side of leaning trees and logs and in hollow trees. Cut away the wet exterior of dead limbs to get dry wood.

A fire can be started with certain tinders even when damp. The resinous pitch in pine knots or dried stumps burns like an oil torch. Slivers of pitchy pine make good tinder and kindling. The bark from birch trees also contains a resinous oil which lights easily and burns fiercely.

Sunlight focused on a pile of tinder through a lens from a flashlight, binoculars, telescope sight or camera, will produce coals that can be fanned into flame. Sparks struck from a piece of flint, quartz or pyrite into a pile of tinder can be used to start a fire. Use the back of your knife blade or any piece of hard steel to strike the sparks. Let them fall on a spark-catcher of shredded cloth, charred rags, dry moss, bird and seed down, dead fungi, punk or pulverized bark. Once the spark catches, blow it gently until it flames.

CHOOSE DRY, well-seasoned wood to make a fire by friction. The bow and drill is the easiest method of making fire by friction. When a dry, soft shaft of wood is spun in a block of the same wood, a black powder will form and eventually catch a spark. To make a fire with these materials, draw the bow back and forth, causing the drill to spin in the block. Start slowly with long strokes and work faster. When a volume of smoke begins to rise, you have a spark sufficient to start a fire. Lift the block, add tinder and blow gently until you get a flame. Fire has been made with a bow and drill in less than seven seconds. The right kind of wood makes a fine carbon dust with the formation of an ember. If you get a coarse, gritty powder, discard the wood and try another.

Fire also can be made by drawing a dry rattan thong back and forth on a soft, dry piece of wood. Wedge timber into a split in the hearth log to catch the embers. The fire-saw, commonly used in the jungle, consists of two pieces of wood and requires plenty of elbow grease. Split bamboo or a soft wood will serve as a rub stick, and the dry sheath of the coconut flower makes an effective base wood. These methods,

SURVIVAL HINTS—NO. 7

This is the seventh in a series of articles condensed from How to Survive on Land and Sea, new U. S. Naval Institute textbook issued by Aviation Training Division of CNO. Individual copies may be purchased from the U. S. Naval Institute, Annapolis, Md.—Ed.

however, should be tried only as a last resort. Fire with matches is infinitely easier.

A small fire is better than a large one for nearly all purposes. A very small fire will warm you if you sit or kneel over it, draping your coat, blanket or parachute so as to direct the heat upward.

A reflector fire will keep you warm while you sleep. The base of a tree, a large rock or a log are ready-made reflectors. Lie or sit between the fire and reflector.

When fuel is scarce, make a hobo stove out of an empty tin can. Such a stove will conserve heat and fuel.

The criss-cross fire is the best all around cooking fire as it burns down to a uniform bed of coals in a short time. The simplest fireplace consists of two rocks, two logs, or a narrow trench on which a vessel can rest with the fire below. If the fire does not draw well, elevate one edge of the log or stone to give the fire more air and a draft.



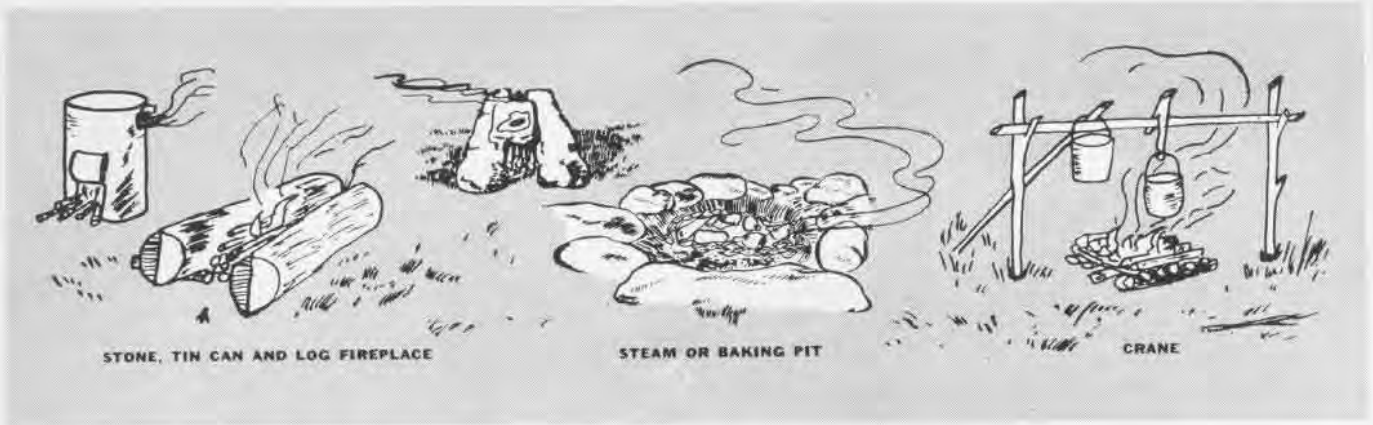
ONE WAY TO LIGHT A FIRE IS WITH A CAMERA LENS. BUT IT IS INFINITELY EASIER WITH MATCHES



COOK FOOD OR BOIL DRINKING WATER IN BAMBOO JOINT. IT WILL NOT BURN UP BEFORE WATER BOILS



COVER CONTAINER AND STAND IN FIRE. HALF A GREEN COCONUT SHELL CAN BE USED IN THE SAME WAY



USING A FEW INGREDIENTS, THE WILDERNESS CHEF PERFORMS WONDERS WITH WILD CHOW

COOK OVER COALS, not flames. Boiling is the easiest method in the arctic. Don't boil food at altitudes above 12,000 ft.; it takes too much time.

To roast or broil food, run a stick through the piece to be cooked and hold it over the coals. Bake food in a pit, closed vessel or a wrapping of clay or leaves. To bake in a pit, get a good bed of coals, drop in a covered vessel containing food. Cover with coals and add a few inches of earth.

Steaming is slower than boiling, but can be done without a container. Dig a hole and fill it with stones. Build a fire to heat the stones. Cover stones and coals with leaves and put in food. Cover this with leaves and dirt. Punch a hole to the food and pour in some water.

Close the hole and the food will steam.

- ▶ *Fruits*—Usually best boiled.
- ▶ *Herbs*—Boil; changes of water will help remove bad tastes.
- ▶ *Roots*—Can be boiled, but are easier to bake or roast.
- ▶ *Nuts*—Most nuts can be eaten raw. Some, such as acorns, are better cooked. Break up acorns, boil with ashes from the fire to remove tannin, mould into cakes and bake.
- ▶ *Grains and seeds*—Parch to make them more digestible and tasty.
- ▶ *Sap*—If sugary boil to a syrup.
- ▶ *Game*—Hang head down and slit the throat. Remove entrails and glands. Animals the size of a domestic cat or larger should be boiled first, then roasted or broiled.

▶ *Reptiles and amphibians*—If small they can be roasted on a stick. Large ones are better if boiled first. Boil turtles until the shell comes off; then cut up the meat and cook with tubers and greens.

▶ *Crustaceans and mollusks*—Steam, boil, roast or bake. They spoil quickly; it is safest to cook them alive.

▶ *Insects*—Fry, boil or roast. They are generally more palatable if disguised in a stew.

▶ *Eggs*—Can be hardboiled and carried for days. Turtle eggs don't get hard with boiling. Fresh eggs are edible at any stage of embryo development.

▶ *Salt*—Obtain by boiling sea water. The ashes of nipa palm, hickory and some other plants contain salt. Dissolve out in water; then evaporate the water.

FRESH papaya leaves contain papain that renders meat soft and tender. Citrus fruits also can be used to pickle fish and meat to make them palatable.



Variety of wild food collected in two hours' time along a river shows what ingenuity will do to help you survive in the wilds



The same food cooked and ready to eat. It will provide for all nutritional needs and taste good. Who would want anything more?

COOKING AND DRYING ARE WAYS TO PRESERVE FOOD FOR FUTURE USE

WHenever you can get more food than you need immediately, preserve it. Meat will keep indefinitely when frozen. Drying food preserves it and decreases its weight without loss of calories. In hot, dry climates sun and air are sufficient to dry food. In humid climates fire must be used and the dried food kept dry.

Build a stick grate 3' to 4' above a slow-burning fire and lay strips of lean meat $\frac{1}{4}$ " thick on this lattice. Do not let the fire cook the meat or draw the juices. Continue the smoking until the meat is brittle. It will keep for long periods and can be eaten raw or cooked.

Cut fish in strips or split them. Leave heads on small ones and hang them over the fire by threading a stick through the gills. Small birds may be gutted and dried whole. Most fruits also can be dried. Cut them into fine slices.

Two of the best concentrated foods are pemmican and pinole. These keep indefinitely and contain a maximum of calories for weight. A man can live on either one for long periods. Pemmican can be made by pouring hot fat over shredded dried meat. Keep in a waterproof container. Cook or eat raw.

Pinole is prepared by parching corn in hot ashes, on heated rocks or in an oven. The browned kernels are then ready to eat or can be pounded into a fine meal. A small handful in cold water will keep all day.

Animals poisonous to eat are so few that they are a slight danger. Spoiled meats and fish are a greater danger. Fish should be gutted at once to prevent spoiling. Meat and fresh water fish should be cooked whenever possible for they may contain parasites. Salt water fish are generally free of harmful parasites.

In the tropics, cholera, typhoid fever and dysenteries can be contracted from eating raw foods. Protect your food from flies. Sterilize it by cooking.

IF DIET is restricted over a period of a month or more, vitamin deficiency diseases are likely to develop. Under extreme conditions there is nothing to do but grin and bear it. Although these diseases are painful and appear serious, they disappear almost miraculously when you get fresh fruits and vegetables.

If symptoms of vitamin deficiency appear, get busy and experiment with new foods. Green grass, for example, contains vitamins A, B, C. Try it.

IN THE NEXT ISSUE: SHELTER IN THE WILDS



Breadfruit, one of the best foods obtainable in the tropics, being cooked directly over coals. Note small fire and its location in the hollow of a rock. Firemaking skill is always an asset

FOGGING IMPAIRS VISIBILITY

Heat with sealed cockpit prevents windshield from fogging in long dives even under humid conditions

WHEN WINDSHIELDS fog over in combat, the pilot is in a precarious position. With visibility gone, he must shift instantly to instrument flight but that is the least of his worries. Evasive action is hard to undertake when the pilot can't see

what he is trying to get away from. A swarm of Zeros could be on his tail without him even suspecting it. But tests reveal that fogging can be prevented by the use of the plane heater, keeping cockpit sealed. NANews tells the story of this important test.

Heat and Ventilation Potent Factors

PILOTS have reported numerous instances where the windshields, bullet-resisting glass and gunsights of combat airplanes have fogged badly during rapid dives. This condition occurs most often in warm, humid climates when rapid descents are made from high altitudes and has caused dangerous loss of vision at a critical time in combat.

Comfair South has conducted tests on the present heater installed in F4U-1 planes, these tests indicating that the proper use of heater will prevent fogging. Tests consisted of diving four Corsairs at 300 knots indicated from 30,000 ft. to 1,000 ft. at which altitude the planes opened their hoods. Manifold pressure was kept at 30 in. during descent. Atmospheric conditions at the time of test were conducive to fogging, dew point 79° F., temperature 82° F.

Comfair South Conducts F4U Tests

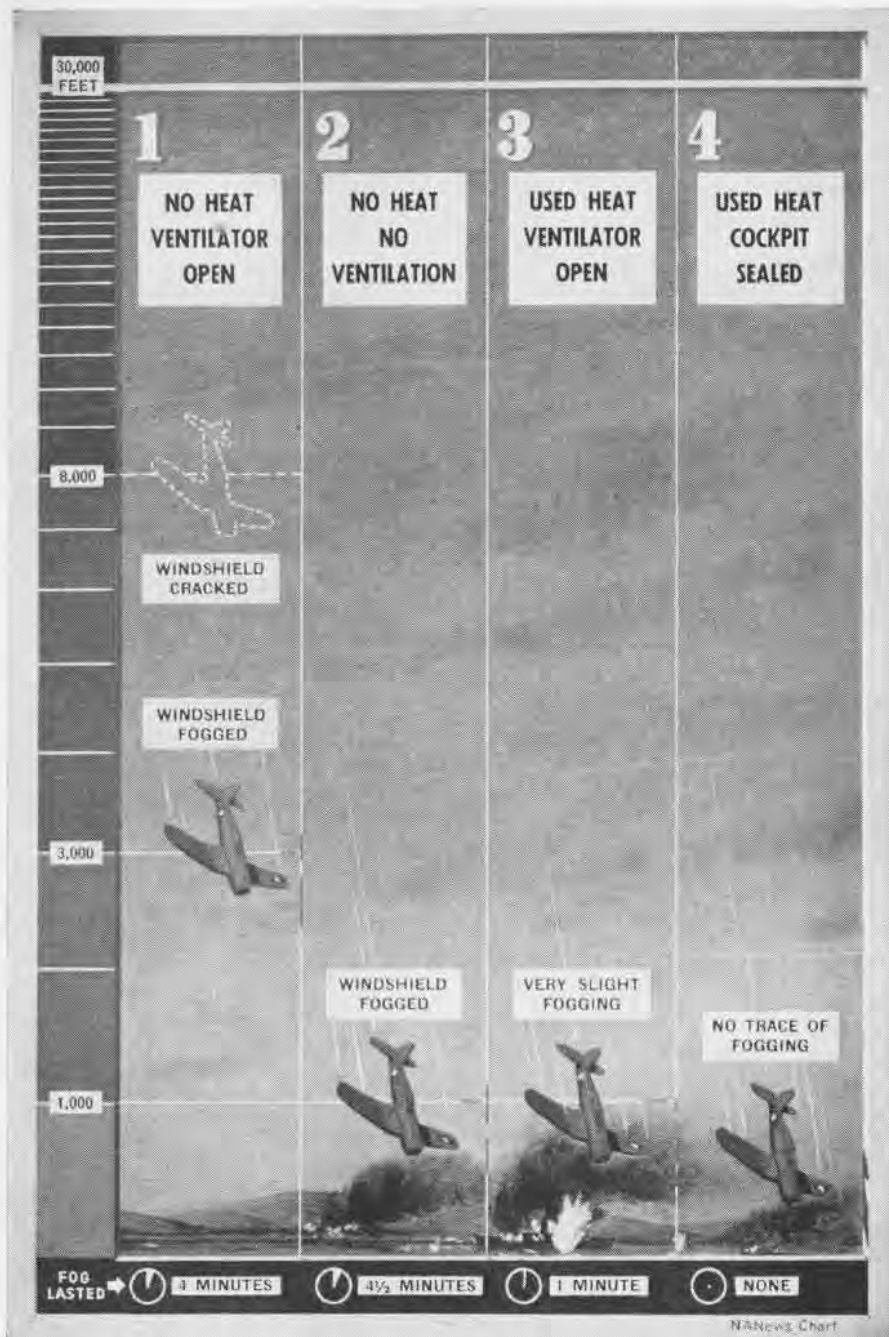
► *Plane 1* used no heat and cockpit ventilator was left open during entire flight. RESULT: windshield in front of armor cracked from contraction at 8,000 ft., armor glass, windshield and sight reflector fogged at 3,000 ft., visibility ahead was impossible for four minutes.

► *Plane 2* used no heat and cockpit was closed with no ventilation. RESULT: at 1,000 ft. armor glass, windshield and sight reflector fogged for 4½ minutes.

► *Plane 3* used heat but left cockpit ventilator open and hatch open to first notch to give the greatest ventilation. RESULT: when the hatch was opened at 1,000 ft. a slight mist occurred on armor glass lasting for one minute; however, it hardly hampered the forward view.

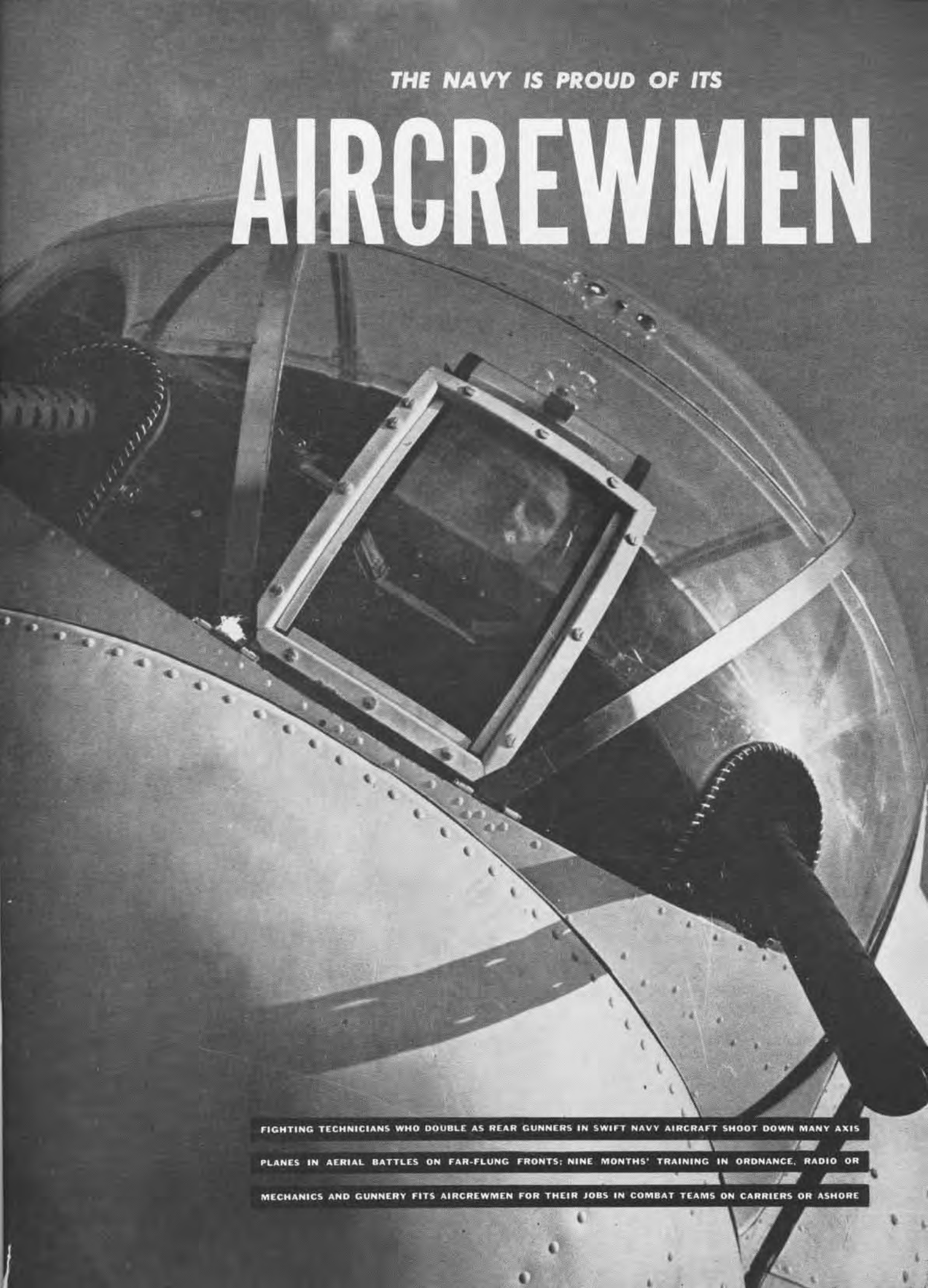
► *Plane 4* used windshield heat with a sealed cockpit. RESULT: There was no trace of fogging during test. The only change to windshield heaters on planes 3 and 4 prior to test was to plug the fuel lines to gun heaters.

THESE TESTS demonstrate the value of keeping windshield heaters in good operating condition and using them whenever flying at high altitudes, particularly in tropical climates where conditions at low altitude are conducive to fogging. It is believed similar satisfactory results will be obtained on airplanes other than the F4U-1 Corsair.



THE NAVY IS PROUD OF ITS

AIRCREWMEN



FIGHTING TECHNICIANS WHO DOUBLE AS REAR GUNNERS IN SWIFT NAVY AIRCRAFT SHOOT DOWN MANY AXIS
PLANES IN AERIAL BATTLES ON FAR-FLUNG FRONTS; NINE MONTHS' TRAINING IN ORDNANCE, RADIO OR
MECHANICS AND GUNNERY FITS AIRCREWMEN FOR THEIR JOBS IN COMBAT TEAMS ON CARRIERS OR ASHORE



FIVE RUGGED AIRCREWMEN, BACK FROM BATTLE FRONTS WITH MANY CAMPAIGN RIBBONS, TYPIFY THE FIGHTING REAR GUNNERS OF THE NAVY

Aircrewmen Have What It Takes

THE NAVY SPOTLIGHT is focused on its AIRCREWMEN, the men who fire the guns and keep the planes flying—the best fighting men that America's vast resources and technical knowledge can produce.

They are the men in the rear turrets and cockpits of Navy aircraft—torpedo bombers, dive bombers and big multi-engined planes. In battle they are distinguishing themselves with the Nation's topflight heroes. They are helping win the fight—combat reports of enemy aircraft shot down in a five-to-one ratio are convincing proof of that.

The AIRCREWMAN is more than just a gunner. He has two separate and distinct jobs. He fires his guns during the short minutes of battle. Before and after that there are other vitally important things that must be done. So the AIRCREWMAN is first a skillful technician. He may be the radioman of the plane, the ordnanceman or its mechanic.

If he is a machinist's mate, he knows airplanes inside out and how to keep them flying—he does his job well because he flies in the plane he repairs. If he is a radioman, he learns to operate radio and detection devices. Or he may

be an ordnanceman, specialist in guns. All three ratings are trained to be expert gunners, to defend planes during attack.

The finest training in the world is given the AIRCREWMAN, much of it training which will earn him a living after the war in radio, electronics, automotive or aviation businesses.

AIRCREWMEN now win their silver Navy wings as soon as they graduate from operational training and are ready for combat. For a 12-month probationary period they may wear the wings and during this time they can qualify to keep them permanently. Formerly, wings were awarded only to men who had three months' experience with a combat unit.

The new plan for AIRCREWMEN puts them in a class with pilots, who win their wings before they go into action against the enemy.

Greater importance is being attached to AIRCREWMEN daily as reports of encounters with the enemy come in from various theaters. The stories are full of the bravery and skill of these rear gunners whose accuracy with the twin .30's and .50's is helping to make the enemy's airplanes more scarce. Many medals have been awarded AIRCREWMEN for their exploits during this war.



OPERATIONAL TRAINING GRADUATES NOW MAY WEAR SILVER WINGS OF NAVY AIRCREWMAN



Aircrewmen talk over battle experiences on return to their carrier, discussing tactics used to shoot down Japanese attackers; some wear guns, shells for defense if forced down on Jap islands



Aerial gunner must be able to do more than shoot; trained as technician, he spends most of time as radioman, machinist's mate or ordnanceman, keeping his aircraft ready to fight at all times

AIRCREW MEN FILL DOUBLE JOB AS TECHNICIAN AND AERIAL GUNNER

WHEN THE AIRCREWMAN'S wings are pinned on his chest, he is not a prima donna whose job it is to shoot down enemy planes. That takes only one percent of his time, even if he is on the fighting front. The other 99 percent of the time he performs the work of his rate—radioman, machinist's mate or ordnanceman. Half of his Navy training, up to the time he pins on his wings, is spent in learning duties of one of those three technicians' jobs.

A defective tube, plugged oil line, fouled fuse setting can be just as disastrous as several Jap slugs in the gas tank,

engine, pilot or gunner. The Navy trains its men to be specialists and the job of gunner is an added ability which the AIRCREWMAN must know to make him an asset instead of a partial liability aboard a fighting plane.

A combat report from the South Pacific illustrates in a few words how valuable good gunners are to their planes—why it is important that they get hits. One Jap Zero attacked the plane from above and promptly was shot down in flames by the turret gunner. Half a dozen planes attacked from various angles but were chased off by heavy defensive fire before they could get close enough to do much damage.

Three more Japs came in from the rear and were repelled by accurate fire. A lone Zero bored in and was shot down, closely followed by a second who came too close to the deadly gunners who were AIRCREWMEN on the American airplane. Several additional attacks were beaten off later.



Navy Aircrewmen spend little time in gunnery classrooms, learn to fire their .50 cal. and .30 cal. machine guns on ranges such as the one above at Yellow Water, Fla. Often stripped to the waist,

the men fire thousands of rounds at moving targets to accustom them to shooting at Axis planes; they must be able to diagnose malfunctions and to dismantle and repair their guns quickly

ED ADAMS,

TYPICAL RECRUIT, TRAINS TO BE AIRCREWMAN





Raw recruit Adams reports in to the Officer of the Day at boot camp, his first stop in the nine months' training the Navy gives him to prepare him to be an AIRCREWMAN. He learns drill and other fundamentals of Navy life during eight weeks at boot camp



Dot-dash signaling with telegraph key and headphones teaches the student fundamentals of communications. In combat, the AIRCREWMAN must handle communications, reporting enemy concentrations while his pilot concentrates on the job of flying the plane



Semaphore signaling is one of several forms of communication to be taught AIRCREWMEN in the technical training phase of schooling. Here Adams copies down signals which a teammate reads from the flagman. Later they switch places and Adams interprets them



In an old SNJ cockpit, the student in technical training radio school gets his first chance to operate under regular conditions of flight, using the type of gear customary for the plane. Students learn various signaling systems. (Career continued next page)

NAVY TRAINS AIRCREWMEN NINE MONTHS FOR GUNNER'S BILLET

BEFORE Ed Adams, a typical Navy man, takes his seat behind the machine guns of a Navy aircraft, he gets one of the most thorough nine months' training courses in the service. It is double-barreled training, fitting him for a specialist's job as radioman, ordnanceman or machinist's mate, followed by eight weeks to become an aerial gunner.

He has to know a lot of things, how to fix jammed guns, how to operate radio and detection equipment, how to read messages flashed to him by blinker lights, semaphore, radio code, or direct-reading signal flags. If he is going to shoot down any enemy planes, he has to know gunnery so he can estimate their range, angle of flight and speed so as to know how far and in what angle ahead he must aim his guns.

Deflection shooting, as this is called, is not easy to master. He fires thousands of rounds of .50 cal. and .30 cal. machine gun bullets on stationary ranges, from moving trucks and

turrets and from planes in flight, to learn this marksmanship.

Ed Adams spends six to eight weeks at boot camp, where he learns rudiments of military life. Here he is selected for technical training school, where he gets complete and valuable training in radio, ordnance or plane mechanics. Four and a half months of this specialized work and his next step is the air gunner's school, of which the Navy has three—Yellow Water and Hollywood, Fla., and Purcell, Okla.

In these schools the technician learns to assemble, take apart and fire every type of aircraft gun used by the Navy, standing still or moving. Five weeks later he earns the distinctive air gunner's sleeve insignia, a badge not of rating but a mark of proficiency with aircraft weapons.

THE LAST LAP of the AIRCREWMAN'S training is two months with an actual operational squadron somewhere in Florida. There he learns the tricks of flying and fighting the same types of airplanes used on the battle fronts. At this time the pilot and aircrew are welded together as a combat team and go through the rest of their training together. On graduation, AIRCREWMEN are awarded distinctive silver and gold wings, a 3d class rating and draw 50 percent flight pay.



Shotgun firing at clay pigeons, tossed at him from various angles, gives Student Adams his first initiation into shooting while he still is in technical training school. Such firing enables him to practice leading a flying target to get his share of hits at any angle



Stripping a .50 cal. machine gun and assembling it in short order is one of the things Adams learns at the Jacksonville technical training center along with his radio work. An aerial gunner must be able to fix a jammed gun quickly if a battle is being fought



Range estimation is an important thing for aerial gunners to be able to do—shots fired at enemy aircraft out of range would be a total waste. Here a training plane swoops over gunnery students who practice sighting and estimating when to begin their firing



All work and no play would make Adams a dull youth, so plenty of "Happy Hours" are thrown in when he can play touch football, box, punch the bag, swim or indulge in almost any form of physical exercise. Here he outruns the opposition in touch football



Machine gun firing from bucket seats, turrets and swivel mounts teaches the student at Yellow Water gunnery ranges how to follow swiftly moving targets, hitting them from every conceivable angle and range; most gunnery training takes place on firing line



Aircrewman must be first a technician—ordnanceman, radioman or machinist's mate—and second an aerial gunner. Here Ed Adams communicates with his pilot over the aircraft's phone system to exchange information. Teamwork in plane crew is important



His technical training completed and with his air gunner's wings on his sleeve, Ed Adams' last lap toward becoming an AIRCREWMAN comes in operational training. Here he flies in regular fighting plane at Cecil Field, Fla., with the pilot to whom he is assigned



Waves play many parts in naval aviation, some of them assisting in training aerial gunners by operating training devices, instructing in gunnery. Many work in the hangars and repair shops so that the planes will keep flying. Navy life also has lighter side



Pilots and Aircrewmen examine a silk tow target to see how many hits they made in their gunnery runs. Colored paints on the nose of the bullets enable them to compile their score. Combat teams go through operational training together to learn cooperation



With wide smile, AIRCREWMAN Ed Adams dons the silver wings as he finishes his nine months' training and takes his place with the other fighting men of the Navy. The wings are awarded as soon as he graduates from operational training somewhere in Florida



In the rear cockpit of one of Navy's new dive-bombers, the Helldiver, the aircrewman reaches the peak of his career aboard an aircraft carrier; finest fighting tools in the world help run up heavy toll of foes



PILOT AND HIS REAR GUNNER TALK OVER STRATEGY OF ATTACK; TEAMWORK OF PLANE CREW IS HIGHLY IMPORTANT WHEN ENEMY PLANES APPEAR

PILOTS AND AIRCREWMEN JOIN TO FORM HARD-HITTING COMBAT TEAMS

FIGHTING a modern war is not a one-man job, and in no place is the need for teamwork more necessary than in a Navy aircraft. Any of them is capable of sinking big Japanese ships, provided the pilot and his AIRCREWMEN do their jobs. That is why the combat team is all-star.

It takes teamwork all through the mission, from take-off to landing. Pilots and AIRCREWMEN must know each other's capabilities. They learn them through the two months of

operational training as a combat team, flying together day after day to learn the ability, habits, personalities, idiosyncrasies of the teammates. Long before they go into battle, they have learned how to do their jobs in such a way that the other members of the team best can do theirs. The final score is the only one that counts.

ATREMENDOUS AMOUNT of responsibility for "bringing them back alive" on a combat mission rests on the shoulders of the aircrew gunners. Teamed with the finest pilots the Navy can produce, flying the best planes, the aerial gunner has a unique opportunity to play an outstanding personal rôle in the war. The long list of AIRCREWMEN who have won medals for bravery in action is indisputable evidence of how important they are to their Navy teammates.



Waves and enlisted men work closely together to improve training as AIRCREWMEN; teamwork is keynote throughout global war



While the captain and other leaders look on, William J. Hisler, rear gunner, tells his carrier how he shot down Jap in Mili battle



SMILES MIRROR HIGH SPIRITS OF GRADUATES OF JACKSONVILLE OPERATIONAL TRAINING AS THEY RECEIVE THEIR COVETED AIRCREWMAN WINGS

150 OPERATIONAL TRAINING GRADS WIN SILVER AIRCREWMEN'S WINGS

FIRST FORMAL presentation of silver wings to AIRCREWMEN upon graduation from operational training was held at NAS Jacksonville, with 150 men receiving their new emblems from Rear Admiral Andrew C. McFall, chief of Naval Air Operational Training.

The presentation marked inauguration of the Navy's new policy of awarding wings to AIRCREWMEN the same way pilots get them—at completion of a rigorous training pro-

gram. Admiral McFall, Pacific combat veteran, told the graduates:

"Your predecessors have performed nobly in action; their courage and toughness is unsurpassed. The Navy depends on you to carry on their fine record. . . . You, as a fighting American, efficiently trained as you are, and flying in a plane of which there is no equal, are part of one of the most powerful attacking forces on earth."

DURING THE graduation ceremonies, which were broadcast coast-to-coast, Bob Hope, radio comedian, was made an honorary AIRCREWMAN by Cdr. John S. Thach, staff training officer of NAOTC. Hope told the graduating class they could "crowd a lifetime of service to your country in 30 seconds." He advised the men "to make it hot for the enemy."



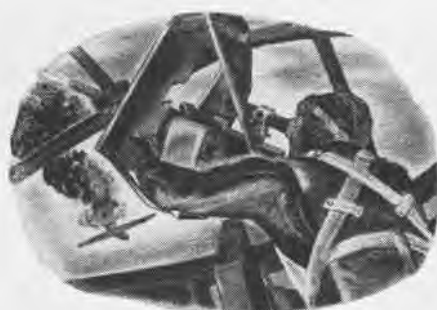
Cdr. John S. Thach, naval air hero now training officer at Jacksonville, pins honorary AIRCREWMAN wings on Bob Hope, radio star



Rear Admiral Andrew C. McFall, chief of air operational training, presents AIRCREWMAN wings to class of 150 graduates at Jacksonville

THEY SET THE PACE

► **JAMES C. LANDRY, ACRM**—Amassed more than 2,100 hours of time in three years, most of it on combat flights. On Christmas night of 1942 the PBY in which he was riding crashed in the water in the Solomons between three Jap destroyers and a cruiser. The crewmen started to abandon the plane under



heavy gunfire which failed miraculously to explode the full load of torpedoes it was carrying. The pilot got the plane in the air again and soon after that the electrical system caught fire from water shipped during the water landing. The PBY made it back to its home field.

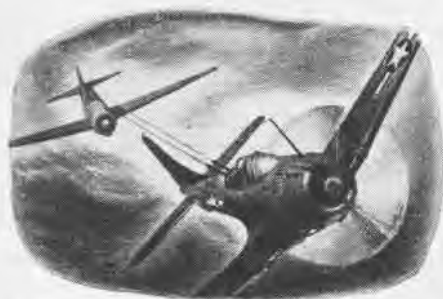
► **HARRY H. FERRIER, ARMLC**—Received the Distinguished Flying Cross, Air Medal and two Presidential Citations during his three years of action, participating in almost every major Pacific battle. He was one of three airmen of famous Torpedo Squadron 8 to survive at Midway out of 48 who went out to attack the carriers *Kaga* and *Akagi*. His plane made a crash-landing at Midway after being crippled in the action. He won the Air Medal over the Solomons and Presidential Unit Citation for action at Marcus, Wake and the Gilberts.

► **KENNETH W. SHERMAN, AOMLC**—SBD gunner aboard the *Lexington*, *Yorktown* and *Saratoga* and was on the *Lex* when it was sunk. His tour of duty took him into action at Salamaua, Lae,



Marshalls, Gilberts, Midway, Solomons and the Aleutians. He shot down a *Zero* at Midway, returning with 36 bullet holes in his plane. Later, in the Russells, he lived for three weeks on coconuts when a convoy bearing food supplies was sunk on the way to his base.

SCORES OF JAPANESE fighter planes and bombers have been shot out of the South and Central Pacific skies by the marksmanship of Navy AIRCREWMEN. American planes have been downing the enemy at ratio of five planes for the loss of each of their aircraft; in later campaigns of the Central Pacific the Jap losses have mounted to the impressive ratio of 13 to 1, including the hundreds destroyed on the ground. Some AIRCREWMEN heroes whose deeds have won official recognition in earlier phases of the war are:



► **WAYNE COLLEY, ACRM**—One of the leading AIRCREWMAN heroes, with four Jap planes to his credit, two of them shot down during the battle of Coral Sea and the other two off Guadalcanal. In the Coral Sea action, four *Zeros* jumped the *Dauntless* dive-bomber in which he was rear-seat gunner. In the resultant melee Colley shot down two of the attackers and the other two fled. Formerly attached to a *Lex* squadron, Colley now is on the *Enterprise*.

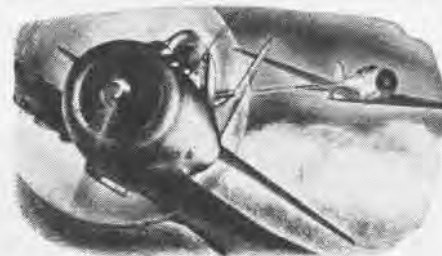
► **JOHN LISKA, ARM3C**—One of the first of America's AIRCREWMAN heroes, Liska also has four Jap planes to his credit. In action in the Coral Sea on two successive days, Liska and his pilot shot down seven *Zeros* after they had sighted a Jap fleet and carrier and dropped a bomb close to the flattop. Two *Zeros* were on their tail after the pull-out and Liska shot down one before his gun jammed. Next day he bagged two more, adding his fourth in the battle of Santa Cruz. He holds the Air Medal, three commendations and two Presidential Unit Citations.

► **JOSEPH DeLUCA, ACRM**—First winner of the Navy AIRCREWMAN's silver wings. DeLuca fought Jap bombers at Pearl Harbor, operating in a plane off the *Enterprise*. He participated in the

battles of Midway, Wake, Marcus, and the Marshalls. DeLuca was AIRCREWMAN for the late Lt. Dickinson when he dropped a bomb on the deck of the Japanese carrier *Akagi*. Later while bombing Japanese shipping he shot down a *Zero*. He was awarded the Distinguished Flying Cross and a personal citation by Admiral Halsey.

► **ANTHONY M. MITCHELL, ARMLC**—Another experienced rear gunner who fought the Japs from the Aleutians through the Dutch East Indies. He participated in action at Paramushiro, Australia, Northeast Borneo, Macassar Straits, New Celebes, Kiska and Attu. During them he took part in numerous bombing attacks on Japanese ships, submarines and shore facilities, downing a Jap float plane in the Alaskan theater and sinking an enemy sampan spying off Hawaii shortly after Pearl Harbor. Mitchell has had some 2,200 hours in the air, much of it on a PBY.

► **LLOYD F. CHILDERS, ARM3C**—On June 4, 1942, Childers was in a flight of 12 TBD's from the *Yorktown* which attacked the Jap carrier *Akagi*. The torpedo from his plane hit the carrier. Childers hit



four *Zeros* during the intense battle surrounding the action but was too busy to watch whether or not they crashed. His gun jammed, so rather than reveal it was useless, he laid his .45 side arm along the barrel of the machine gun and emptied it at the *Zeros*. Crash-landed in the water near his carrier when the engine went out. Childers holds the Distinguished Flying Cross.

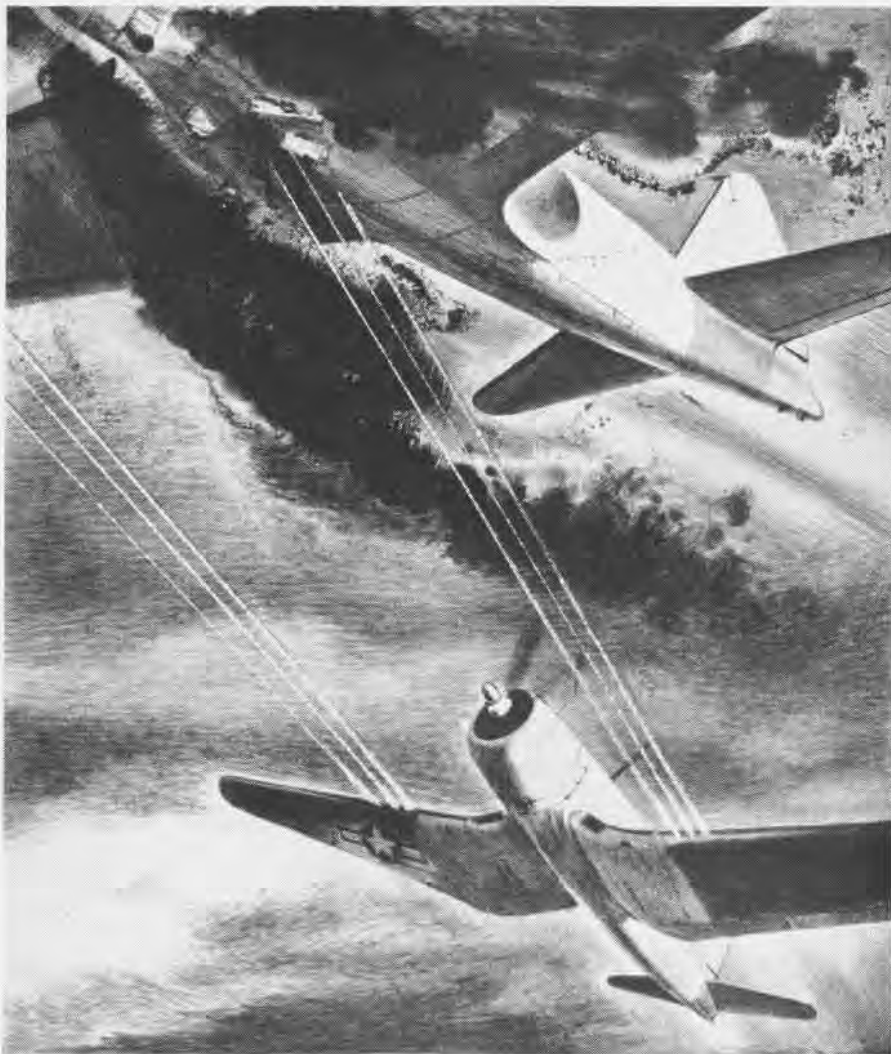
► **WILLIAM J. HISLER, ARM3C**—Participated in the Marshalls and Gilberts campaigns. While on a routine patrol over Mili, his SBD met a Jap *Betty* and chased it 125 miles before getting into firing position. The pilot's guns jammed and he maneuvered the dive-bomber so that Hisler was able to shoot it down.



Navy Avenger torpedo bomber, carrying both a turret and tunnel gunner, flies over Wake Island during one of many strikes by Navy against Jap-held bastion; torpedo planes must defend themselves as they attack shipping

Tremendous firepower of modern aircraft is graphically shown by this striking photo of a Japanese freighter taking a terrific pasting from aerial gunners; plane's guns can sink many small surface craft such as Japanese use





MONDAY—SOMEWHERE IN PACIFIC

0500—Division took off for dawn patrol. Landed 0700. No contact.

0745—Major P's division took off to act as bait on fighter sweep.

0755—Lt. S. and 4 divisions took off on sweep.

STATEMENT BY MAJOR P.

WE WENT IN OVER target at 18,000 feet, circled once and a half before the *Zeros* started taking off. Planes were parked on both sides of the runway, *Zeros* on one side, while the planes on other side were much larger—took them to be bombers and would estimate about ten.

When the *Zeros* took off, they flew straight out over the water and formed up—climbing. At this point, we jumped 'em and made a pass down through them. I got one from overhead going straight down. As I pulled up, I saw I had one on my tail. Somebody—I don't know who it was—shot him off.

I then checked my guns and found

MARINE CORPS REPORT

that none were working. Charged them a couple of times and got four working. I then went back into the fight and got another *Zero*, firing directly from behind him. He went down in flames.

After this, I had only one gun working, and two *Zeros* on my tail. They chased me all the way to X, and then left me.

STATEMENT BY LT. S.

We circled target and spotted *Zeros* taking off. I counted eight. We then dove from 20,000 feet to approximately 7,000—but did not spot the *Zeros* as they had made a sharp left turn after taking off, and had gone down along the coast to rendezvous and gain altitude.

We then climbed back up to about

18,000 feet and continued circling target, calling on the radio for the Japs to come on up 'n' fight. After making about one turn of the field and being between X and Y, we spotted from 30 to 40 *Zeros* flying in no set formation, coming up from the south at our altitude. A climbing duel ensued—both flights jockeying and circling to get above and behind the other. The *Zeros* were climbing a little faster, so Major B. turned into the middle of them. We followed shortly behind him.

As we came in, three *Zeros* turned toward us. The first one that got in front of me rolled on his back, and pulled through while still out of range. The second made a determined head-on run, rolling as he came in and pulled down through in front of us. I gave him a long burst and could see my tracers going into him. He trailed smoke, but I didn't see him go in.

I then nosed over violently and pulled out of the flight and circled to gain altitude. As we reached the altitude of the fight, we (my wingman and I) spotted three *Zeros* on a parallel course. They seemed reluctant to attack. We turned into them and, rather than turn head-on-two, started a right-hand spiral down. Number three climbed above and, as I started my run on number two, I could see three roll over. I pressed home the attack on two and figured that number three couldn't get to me before my attack. At 30 degrees deflection from the rear, I opened up on him from about 200 yards, holding fire until very close. I knew I was hitting him. I then nosed over violently to get away from number three. My wingman, who was slightly behind and who had pulled up, saw number two belch smoke, go into a steep spiral dive, and finally hit the water.

I made a violent right-hand turn in the dive, leveled off, held level flight for a short time, and then started climbing. When I had climbed about 1,000 feet and still had a lot of speed, I spotted a *Zero* to my left, with his belly to me (probably number three, who turned back when he could not follow me in the extreme speed of the dive). I had 50" and 2700 rpm and had been going straight down.

I pulled up and took a long burst at his belly at 60 degrees deflection. I could see large pieces flying from his plane. He seemed to float aimlessly for a short period, smoking badly, then went into a spiral dive. I then looked around for friendly planes to form up on. As I circled, I kept glancing down at him, and finally saw him hit the water. No parachute was seen. I saw no other planes after that, so I put my nose down and then headed for home.

SHORE STATIONS

► **NAS DALLAS**—The use of light-reflecting paint has eliminated the need for additional lighting in some areas on this station. The A&R engine overhaul shop registered complaints, asking for more lighting. The problem was solved by lowering the present lights and concentrating them where fine work is required and by painting all bulkheads to a height of eight feet with a light-reflecting paint. A requisition for 12 more lights was thus eliminated, saving \$253 for new fixtures.

► **NATTC MEMPHIS**—The hand-to-hand combat program here handles more than 1,000 men a day. Mech students spend five weeks under the program, radiomen four and ordnance-men three. By the time they complete these courses, they are well able to take care of themselves under almost any condition involving hand-to-hand tactics. They know all the tricks



of the dirty-fighting Jap's trade. A feature of the course is the gun-fight competition. A pistol is thrown on the deck between two competitors. Each goes after the gun with the objective of getting that gun into a position to kill his opponent.

Each man is taught how to defend himself, while unarmed, against all types of firearms, knives, swords, clubs, blackjacks, as well as improvised weapons such as chairs, rocks, and bottles. He also learns to use these weapons offensively.

► **NAS CLINTON**—To combat soil erosion the following program is under way at this station:

a. Planting of 1,000 Chinese elm trees. The soil conservation officer is trying to locate 19,000 additional trees to act as wind breaks.

b. Bermuda grass is being planted in the immediate vicinity of buildings and athletic areas in an effort to keep down the dust. About 200 acres are being planted by the sprigging method of planting roots. The remaining area is being planted in native grass seed drill method, using about 60,000 pounds of seed. Dust is the main problem here along with some water erosion. The Bermuda grass is being dug in nearby fields and replanted by hand, rolled and fertilized.

► **NAS DALLAS**—The Gunnery Department now uses fabric removed from damaged aircraft wings for backing targets. Mounted on frames, the fabric also serves for windbreaks on the outdoor pistol range and for

windbreaks in the salvage yard for crews working outside salvaging lumber and other items. This fabric, impregnated with paint and dope, was formerly useless.

► **NAS LIVERMORE**—Speedier maintenance and repair of airplanes and a reduction in "out-of-commission" time has resulted from establishment in A&R of a new maintenance engineering line crew. This crew, with a chief in charge, is a part of the maintenance section of A&R and consists of 15 men selected for their mechanical and troubleshooting abilities. Their work is facilitated by use of a specially equipped truck which continually patrols the lines carrying a limited stock of materials, including ailerons, tires, a prop, high-pressure air bottles equipped with pressure-reducing valves for inflating tires and special tools required for quick repairs.

► **NAS NORMAN**—The Naval Air Navigation School is being transferred from Hollywood to Shawnee. The Shawnee project was constructed originally as an auxiliary facility of this station, but was not commissioned as such owing to its uncompleted runways. The decision to convert the \$3,000,000 Shawnee base into a specialized training station was reached following the inspection tour of the Chief of NATC.

► **NAS LIVERMORE**—Conservation of buses, trucks and station wagons is the keynote of the transportation department's control plan here. By careful logging of time of departure, load, destination and number of passengers, data have been obtained making it possible to reduce the number of trips and eliminate others altogether. It is estimated that the revised schedules have effected savings of 23,000 miles per month.

► **NAS MEMPHIS**—Shortly after this activity was commissioned, the supply officer was confronted with the question of payment of the Tennessee state gasoline tax. After much study and inquiry on this question, it was determined that gasoline contracted for outside the State of Tennessee was not subject to the state gasoline tax. BuSandA was informed that a saving of maintenance funds could be made if the contract in force at the time could be amended to allow this activity to purchase gasoline outside the state. BuSandA com-

plied with this request and commended the station for bringing this fact to its attention. On this basis, all gasoline purchases possible were made outside the state, resulting in a saving for the fiscal year 1943 of approximately \$200,000.

► **NAS St. Louis**—Numerous letters of thanks have been received from various organizations concerning the work of the "Shipmates of Rhythm," a volunteer orchestra of enlisted men. Made up of musicians from departments on the station, this organization has practiced on the members' own time and has made numerous appearances before war bond and other patriotic rallies and meetings. Officials of the Treasury Department and war plants in the area have been generous in their praise of the group which has been a credit to the station and to the Navy.

► **MCAS EL CENTRO**—Tripoli, canine member of the guard detachment, has been promoted from corporal to sergeant. Tripoli recently did an outstanding job in acquainting new members of the guard detachment in the routine job of walking their newly assigned posts on station.



► **MCAS EL TORO**—Acquisition of a bombing target area within eight miles of this station will speed up the training program of dive bombing, masthead bombing and skip bombing. A site of approximately 1,800 acres has been acquired on Trabuco Mesa and the erection of targets has begun.

► **NAS DALLAS**—The A&R Department recently was visited by representatives of BuAer and of the Marlin Rockwell Corporation. These representatives instructed A&R inspection division personnel in making proper inspection of bearings used on Continental engines. Bearings which had been previously rejected and reported unserviceable were cleaned and reinspected by the representatives. Inspection personnel were thus provided first-hand information on the proper methods of bearing inspection.

Many bearings previously rejected were accepted by the specialists. Recommendations as set forth by the representatives relative to bearing inspection are already in effect and paying dividends. Reinspection of one month's accumulation of rejections, comprising 108 bearings, resulted in 55 of them being returned to service.

► **NATC CORPUS CHRISTI**—Operated by the Chaplain's department, a new reception center has been opened at the South Gate.



to provide cadets and enlisted men with a place to meet their families and friends.

Built by Public Works, the center has game rooms, a large fountain and snack bar operated by Ship's Service, a record-playing machine as well as a recording device, two pianos and other recreational facilities. The center has its own separate gate house and visitors are admitted by telling the guard whom they wish to visit.

► **NATC CORPUS CHRISTI**—The third anniversary of the commissioning of *NAS* was observed during March without formal ceremony as naval and civilian personnel continued their program of turning out the "world's finest aviators."

Since its commissioning on March 12, 1941, the station has grown from sand dune wastes and mesquite brush to a Naval Air Training Center with auxiliary fields at Rodd, Cabaniss, Cuddihy, Kingsville, Chase and Waldron.

► **NAS NORFOLK**—For the convenience of air station personnel, The Chesapeake & Potomac Telephone Co. has established a telephone trailer at Gate 4. An automobile house-trailer was converted to serve the purpose, containing a small switchboard where an operator is on duty from 0900 to 2200 to handle long distance and local calls. Private booths and a lounging room where reading material and cigarettes are furnished to those awaiting calls also are provided in the trailer for the service men.

TOKYO TALKS

—TO EAST ASIA

Japanese children, ranging in age "from about 7 and 8 up to 11 and 12 years," are now making house-to-house visits in Japan urging the householders to watch out for fires and save electricity for "the destruction of the United States and Britain," it was revealed by an official of the Japan Broadcasting Corporation, Shin-jo Sawada.

—TO JAPAN

The Imperial Rule Assistance Association, Japan's mass totalitarian party, has begun a campaign to round up all telephones now being used for "non-essential" purposes. "In this movement persons who do not have any actual need for telephones in their homes will be asked to turn them in voluntarily, and more telephones will be installed in important factories, shipyards and other such necessary places."

—TO JAPANESE AREAS

A flight first lieutenant who had just recently returned from Rabaul has "emphasized strongly that the only way to respond to the strenuous fighting of the officers and men on the front lines is to

send as many planes as possible, even one more plane, as quickly as possible." The officer was also said to have insisted that it was not enough for Japanese leaders "merely to tell others to do their best" but to "emphasize that it is necessary to respond with materials in order to cope with the enemy planes."

—TO ASIA

Sotaro Ishiwata, newly appointed Japanese finance minister, declared at a press conference that "the tax burden is a great one, but I believe that in order to win this war the people gladly should bear this tax burden, even if they should have to go naked." He said that, "in the lowering of the living standard is found the real substance of war." Ishiwata then made a plea that every Japanese "plan new savings" and declared that "increased savings are absolutely necessary to absorb bonds in order to meet the colossal budget" of 51 billion yen.

—TO THE UNITED STATES

With Japan pushing her campaign to increase aircraft production under the slogan "even one more plane," the Tokyo radio recently broadcast a letter by a Japanese mother apologizing to the nation because her son had crashed a "precious plane" in an action in which he was killed "in the Southern skies." The woman, 54-year-old Akino Sasaki of Kyoto, sent a 1,000-yen contribution to the Japanese authorities to help build another plane. She said, "I have no words to apologize to my nation that a precious plane has been lost due to my child."

—TO ASIA

The recent padlocking of places of amusement, including restaurants, cabarets and Geisha houses, has helped to alleviate the acute housing shortage in Japanese war-production centers and to provide additional office space for wartime government "control" agencies. "The nation's famous restaurants are being converted to the war effort one by one in rapid succession." Many have been turned into "public mess halls." In Tokyo alone 9,800 "high-class entertainment" places have been closed. Domei also says that the closing order released 35,000 employes for "mobilization in munitions factories and other wartime industrial plants."

—TO INDONESIA

Japanese occupation authorities in central Java have ordered school teachers to stop wearing sarongs. As "another step to make the Indonesians fit in with the far-reaching changes in their daily life," the men hereafter must wear "pants or shorts" and the women skirts.

—TO JAPAN

Viscount Nagakage Okabe, Japanese Education Minister, has announced government plans to extend its "thought control" program by stepping up the activities of local "Thought Measure Research Societies" and by giving "thought training" to business leaders as well as to students.

SNOW ME THE WAY TO GO HOME



WHERE'S THAT JAP?

Required: Mk III Board

Mid-Lat. 24° N, Mid-Long. 163° W

PT. ABLE: Lat. 25 00' N, Long. 164 00' W

U.S.S. SARATOGA: 0900 position, Lat. 23° 43' N, Long. 164° 13' W, on Cus 105°, speed 20 k

ORDERS: Depart PT. ABLE at 0900 Scout Cus 086° to maximum distance, returning to Saratoga at 1130. Flight level 2,000 ft. IAS 120 k.

AT FLIGHT ALTITUDE: Wind from 060° force 22 k. Var 12° E, T (+) 17°

What is the position of the point of turn in?

(Answers on page 39)

Fictitious Ship

Cus

Speed

Scouting Course

PGS

TTT

To intercept Saratoga

MH

PGS

Position of Turn

Lat.

Long.

TWISTERS



May, June Are Worst Months for Tornadoes—Most Violent, Least Extensive and Most Sharply Defined of all Storms

THE TORNADO SEASON is here, with the worst period yet to come. January is a dull month for the twisters, but they begin to occur with greater frequency as the year wears on, hitting the peak in May and June and then tapering off as the mid-year develops.

OF ALL ATMOSPHERIC disturbances, tornadoes are the most violent, yet they are so small in their diameter and influence that they never appear on the synoptic weather map. Because of their highly localized nature, it is impossible to forecast their exact point of origin or their precise path of movement.

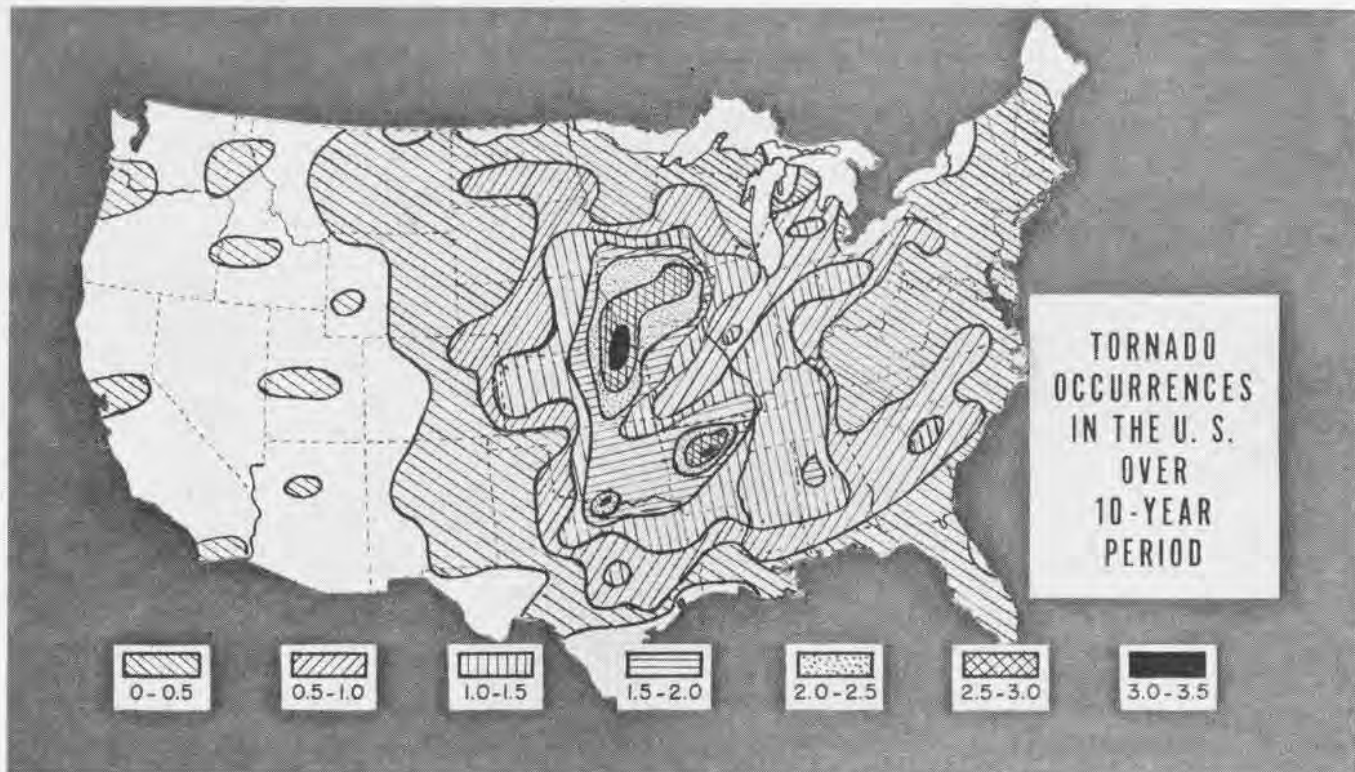
The tornado or "twister" of the American prairies is defined as a slightly

funnel-shaped, hollow, circular column of upward-spiraling winds of destructive velocity. It is the most violent, least extensive, and most sharply defined of all storms. Although the funnel-shaped cloud is the most well-known characteristic of the tornado, other less funnel-like shapes are often assumed. However, in all cases, whatever the shape, the tornado appears to hang from the bottom of a much greater cloud mass.

Little is known about the cause of tornadoes or their mode of formation. It is assumed that they are the result of excessive instability. Meteorologically, they usually occur in the southern quadrant of an advancing low-pressure area, and seem to be formed at the

cloud level by the passing of a cold northerly current by a warm current from some southerly direction.

IN OTHER WORDS, with certain pressure distributions prevailing over the interior of the United States, warm, moist tropical air from the south and southwest moves inland and encounters the cold polar air masses descending over the broad expanse of comparatively level valleys and plains and moving southward from higher latitudes. The meeting of these opposing air masses gives rise to atmospheric phenomena of varying intensity, which may, particularly during late spring and early summer, produce tornadoes.



DUST AND DEBRIS CARRIED ALOFT BY STORM CONTRIBUTE TO ITS AWESOME APPEARANCE

A RAPIDLY MOVING cold front often moves faster aloft than it does on the surface because of frictional drag. The potentially colder air aloft moves out over the potentially warmer air, giving rise to a critical situation. In almost all such cases, the slightest convection or updraft along the upper portion of the front will give rise to huge cumulonimbus clouds and thunderstorms. In the same way, if the contrast between the air masses is great enough, the convection will start a cyclonic-counter-clockwise in the Northern Hemisphere—circulation that results in the formation of the vortex of a tor-

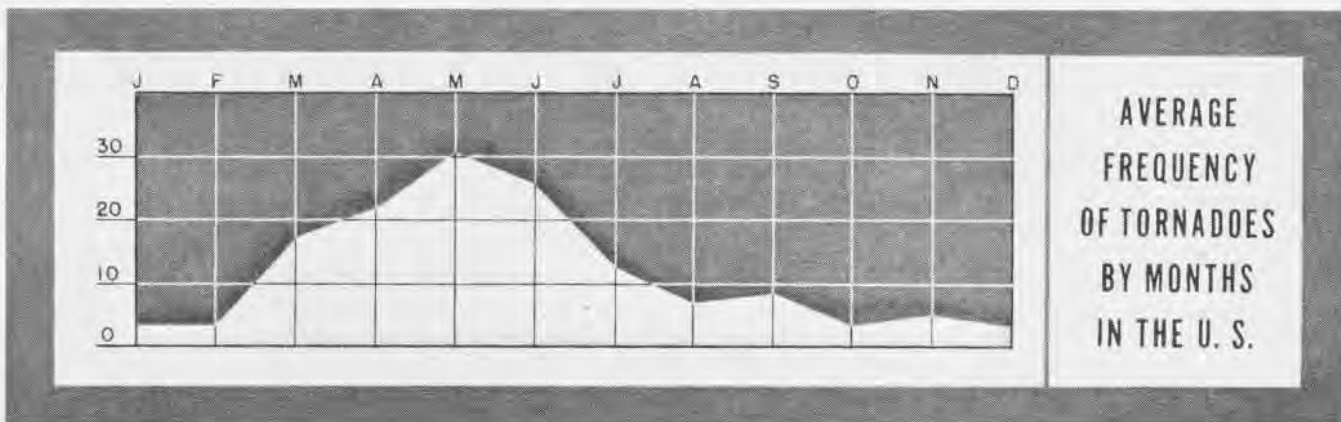
nado. For this reason, tornadoes are usually accompanied by severe thunderstorms, moderate rain, lightning and often hail. For the same reason, the base of a tornado funnel is the same as the ceiling under the thundercloud base—1,000 to 3,000 ft.

The vortex, after a certain period, develops very low pressure in the center. This decreased pressure causes expansional cooling of the air that results in the formation of cloud particles which make the funnel visible. The visible funnel may be seen to grow downward from the parent cloud above, and where it touches the earth, there

is destruction. Dust and debris carried aloft by the ascending currents contribute to its foreboding appearance.

The average tornado moves from the west to southwest, along a relatively straight path, toward the east or northeast at a speed of about 20 to 40 mph.

AT TIMES when the surface winds are lighter than the winds aloft, the upper portion of the tornado may be carried ahead, lifting the tornado from the ground or destroying it completely. Consequently, winds aloft of about the same velocity as those near the ground will cause tornadoes of longest duration and intensity. Tornadoes have occasionally moved along the ground as far as 200 to 300 miles, but the average path is usually much less—about 20 to 40 miles in length. Any distance greater than this may be considered unusual.



WINDS IN VORTEX CAUSE GREATEST DESTRUCTION

THE PATH of a tornado is usually about 1,000 ft. wide and never more than a mile. By far the greatest destruction is caused within the vortex. Actual velocities are unmeasured, but it has been estimated that horizontal velocities increase rapidly toward the center from about 40 to 50 mph around the edges to 200 to 500 mph near the center. Vertical winds in the central part of the vortex reach velocities estimated at 100 to 300 mph.

There are two types of tornadoes: 1. Conventional cold-front type—caused by the interaction of cold polar air and warm tropical air masses, and 2. Precipitation-induced type which occurs in conjunction with cold fronts—caused by the interaction of a precipitation-cooled mass of air with a warm tropical air mass. Type 1. almost always assumes the characteristic funnel-shaped cloud, with a 2,000 to 3,000-ft. base, which can ordinarily be seen for great distances. This type usually occurs in groups or families, numbering from 2 or 3 to as many as 12 or 15 in connection with a single front. Type 2. forms on the base of very low clouds with a ceiling of 1,000 ft. or less, and more than likely assumes some other shape than the typical funnel cloud. These twisters usually are experienced singly or occasionally in pairs. They are the most dreaded for they may appear without any advance visual warning. For the U. S. as a whole, tornadoes are most frequent between 1500 and 1800 and least frequent between 0700 and 0800.

ATORNADO is so easily recognized and its extent so small that in daytime its path may be avoided by aircraft without difficulty. Since it moves with the prevailing winds, its path may be forecasted roughly. A pilot should never get caught in a tornado except possibly at night, and even then the accompanying lightning should be ample warning.

If a tornado is seen approaching or reported traveling in the direction of a station, the following precautions should be taken immediately: 1. If at all possible, aircraft should be flown out of the danger area; 2. if it is not practicable to fly out all planes, as many as possible should be placed in hangars and the others tied down securely; 3. grounds around the station should be policed for all rocks, lumber, gasoline or oil drums, and all other such objects that may be picked up by the winds of the tornado and blown against planes, hangars or other buildings in the area.



THIS TYPE OF TORNADO FORMS ON THE BASE OF CLOUDS WITH A CEILING OF 1,000 FEET OR LESS

TECHNICALLY SPEAKING

Frame Protects Operators

Change Made in Finger Lift Truck

NAS PEARL HARBOR—A simple but effective device to protect finger lift operators from danger of falling objects has been originated and placed in use by this station's safety engineers. In lifting piles of objects which exceed height of the lift frame, there always is the possibility of the topmost objects falling on the operator.

The open ends of the U are secured to the lift frame top and additionally



FRAME PROTECTS WORKER ON FORK TRUCK LIFT

secured by horizontal braces. Steel 1-in. mesh screen has been placed across the protector frame to guard the operator against small articles which cannot be caught by the frame channels. Tests showed this device could sustain weights of more than 2,000 lbs.

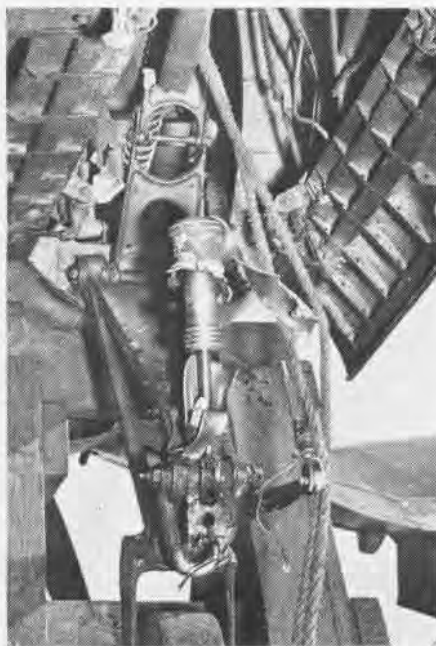
► **BuAER COMMENT**—Safety in operation of fork trucks under unusual grade and surface conditions where two pallets are being handled cannot be overstressed,

especially when a number of smaller boxes make up the pallet load. An optional method of protecting the operator where conditions warrant additional safety consists of a rack placed on the heel of the lifting forks between the load and the upright frame. This rack is all that is necessary and conserves critical materials which would be needed for an overhead steel frame.

Oleo Shock Strut Explodes

Oxygen Is Used to Fill Struts

After an hour of flight, a pilot in an F4U-1 made a normal approach and a



CORSAIR SHOCK STRUT EXPLODES ON LANDING

rather hard landing. The plane bounced once and when it hit the second time the tail wheel oleo shock strut exploded.

The explosion was quite loud and a sheet of flame and smoke issued from the tail section. The resulting investigation revealed that maintenance personnel had been using breathing oxygen to inflate struts on airplanes attached to the squadron.

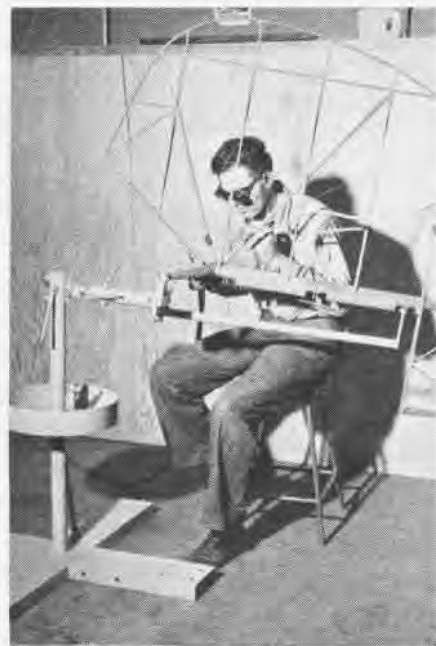
► **BuAER COMMENT**—The hydraulic fluid used in shock struts and hydraulic systems is inflammable. When hydraulic fluid vapors are mixed with pure oxygen, an explosive mixture results. The heat build-up due to compression of air in a shock strut during a hard landing is sufficient to cause the mixture to ignite. Use of oxygen for inflating shock struts and hydraulic accumulator is prohibited, and

all maintenance personnel should be warned of danger resulting from unauthorized use in the hydraulic systems of naval aircraft.

New Aid for Welding Work

Positioning Stand Saves Time

NAS MINNEAPOLIS—A supporting and positioning stand for welding work has been developed at this station. The stand is equipped with a positioning table, to which work may be secured and adjusted so the most advantageous working angle may then be attained. For



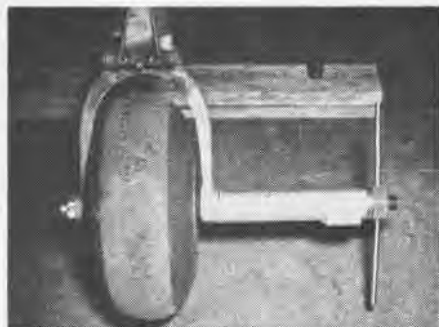
WELDING STAND SECURES WORK AT BEST ANGLE

special work, such as changes on rudders and exhaust stacks, the positioning table may be removed and specially designed jigs mounted on the stand. Work may then be firmly clamped in place and easily handled. The time required for rudder changes has been reduced 50 percent. Warping of exhaust stacks has been eliminated by clamping them in place and preheating prior to cutting the shield with a slightly oxidizing flame, using a medium tip. Blueprints and specifications may be obtained from this station upon request.

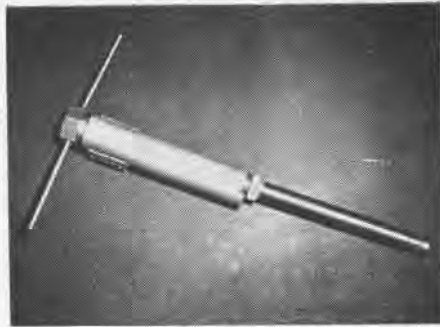
[DEVELOPED BY D. W. SCHEER, AM2C]

► **BuAER COMMENT**—The welding positioner has a definite use in all stations; however, there are numerous types for special adaptations available on the market.





AXLE PULLER IN POSITION ON PV-1 AIRCRAFT



AXLE PULLER CONSISTS OF FOUR SIMPLE PARTS

Tool Draws Out Tail Axle PV-1 Tool Proves Successful

NAS LAKE CITY—Because of difficulty experienced in finding a suitable drawing tool for removing PV-1 airplane tail wheel axles, this unit devised one of its own. The puller consists of a mandrel to be inserted through a hollow axle and sleeve.

A draw nut was then provided for tightening down on the drawing mandrel, pulling axle out of fork into sleeve. Difficulty was encountered in finding cylindrical stock heavy enough to provide the sleeve into which axle was drawn.

It was discovered that PV-1 main gear jacking pad, part No. S-80200, could be used as a sleeve for this tool. It required only the notching of one end to allow for axle retaining lip on tail wheel fork and insertion of a bushing and set screw. The jack pad may be used for jacking by removing the threaded mandrel.

Design Deck Pendant Hook Is Quick Release Advantageous?

A cross-deck pendant hook has been designed and constructed on the U.S.S. *Bunker Hill*. The hook has proved to be of great value on the flight deck for securing cross-deck pendants to securing track which have been stretched back for one purpose or another, whether for lubrication, inspection, or to clear deck space for elevator operation. Partial pressure on pendants can be restored after being fastened to hook

and, when released, immediately resume their taut position.

Hook in photograph has two claws to engage securing track on flight deck. This has since been modified to just one claw, thereby enabling hook to swing at any angle from securing track.

Cross-deck pendant can be released from hook with minimum effort by withdrawing pin which holds hinged part of hook down to the base. Once withdrawn, hook proper swings upwards and allows cross-deck pendant to spill out from bite of the hook.

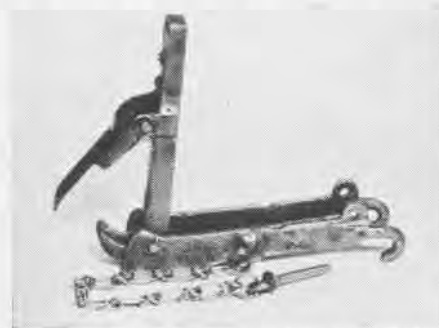
[DESIGNED BY VINCENT PREVITI, CMM, USN]

► **BuAER COMMENT**—From information available, need for quick release has not been felt in the past as most ships have solved the problem with a simple device, made of steel plate with one end bent down to engage track and other bent up and rounded to retain pendant. Should other carriers consider it warranted, BuAer requests recommendations to that effect be forwarded.

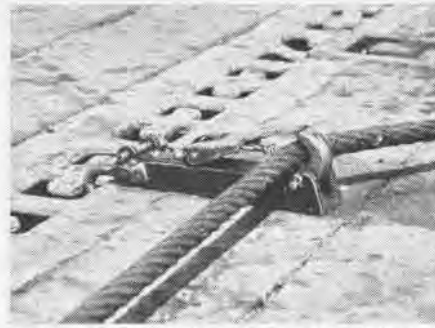
Study Instruction Booklets Should Be Available on Carriers

Arresting gear officers aboard aircraft carriers should take steps to obtain publication NAVAER 19-81, *Operating Instructions for Mark IV Arresting Gear* (Confidential), as it contains vital information on the operation of such gear.

These books are sometimes placed in the custody of the communications officer with other confidential pamphlets and their existence aboard may be unknown to the arresting gear officer, who should take the necessary steps to secure the publication from proper source.



PENDANT IS RELEASED BY WITHDRAWING PIN



HOOK SECURELY HOLDS CROSS DECK PENDANTS

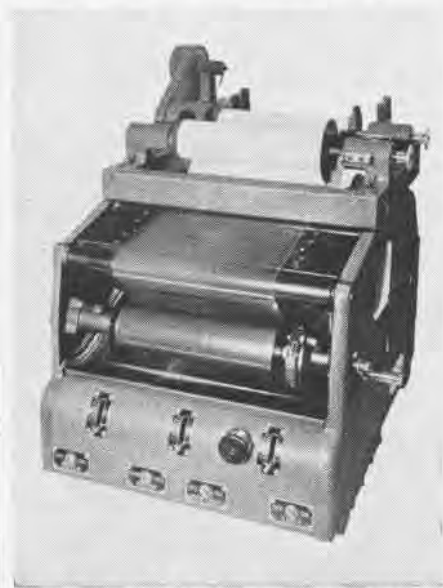
PHOTOGRAPHY

Number and Caption All Photographs

Proper numbering and captioning of prints is important. Points to remember are:

- a. Always include unit, number, date, location and all essential subject matter
- b. Where applicable, include full names and ranks of personnel, together with home town when available
- c. It is easy to eliminate non-essential information from a caption, but it is impossible to supply any information not given in the original entry
- d. Accuracy is the prime requirement
- e. Completeness is vital
- f. Date the photograph for day it is made—not for some subsequent time when the print is made
- g. Be sure caption answers questions of what, why, who, when, where, how
- h. Each member of a photographic unit is responsible for proper captioning.

► A technical bulletin dealing with the use of the Sonne continuous strip contact printer should be of interest to photographers using this equipment. The printer



SONNE PRINTER THREADED FOR DIAPOSITIVES

was designed to print aerial roll film on either paper or roll film in widths up to 9½ in. and 250 ft. long. Its practical uses in reconnaissance laboratories are:

1. A fast method to print aerial roll film on single weight waterproof paper which for speed work can be swabbed and delivered wet
2. The Sonne printer is ideal for making diapositives and dupe negatives
3. It can also be used to make a satisfactory dupe black and white negative from Kodacolor. Attempts to duplicate Kodacolor with other color films have not been successful from a practical standpoint.

Develop Compact-O-Hangar Is Portable Shelter for Planes

To ease the problem of airplane engine maintenance, BuAer has developed a portable engine maintenance shelter for use as substitute for hangar known as a Compact-O-Hangar.

The shelter has a framework of waterproofed laminated wood sections, giving a strong rigid construction. By tapering and arching sections, material and weight are distributed at the specific points where stresses occur. It has

a built-in trolley rail extending 10 feet beyond the front opening and is equipped with a one-ton gear type hoist to be used to mount engines. Dimensions are 14' wide x 8' deep x 16' high.

The shelter is covered with a treated canvas duck with plastic glass windows, heater duct opening, a telescoped canvas sock easily fitted to various types of planes, and zippers to close openings. The shelter comes complete with a wood floor and guy wires. It is crated in four wooden boxes and has a total weight of 1,790 lbs.

Shelters have been procured on Con-



CANVAS DUCK COVERS FRAMEWORK OF SHELTER

tract N288s-16150 and are being distributed for service. Since operations are conducted at many outlying fields where hangar and shelter facilities are limited, BuAer believes the Compact-O-Hangar will be useful.

Trim Flanges With Cutter Clips Metal at Correct Height

NAS ALAMEDA—A mechanical sheet metal flange cutter has been developed here as a result of the beneficial suggestion program to eliminate the bottleneck which occurs in all plants where the material to be formed cannot be blanked out exactly to size before forming operations take place.

Trimming of flanges and heads in various types of ribs, fittings, brackets, stringers, capstrips, etc., was formerly done by hand or sawed, filed and then emery-clothed. This adapter eliminates all these operations by means of a table that keeps the material to be cut at the correct height, and by making a clean cut that requires no further operation.

The job is accomplished by use of a table to lay the work on, this table being adjustable up or down, and two



OSCILLATING CUTTER ON INSIDE TRIMS METAL

(Succeeds list of February 16, 1944)

LATEST NUMBERS OF ENGINE, AUXILIARY POWER PLANT, PROPELLER AND ACCESSORY BULLETINS

March 18, 1944

Engine	Bulletin	Date	Auxiliary Power Plant Bulletin	Date
Pratt & Whitney				
R-985	none		12	2-10-44
R-1340	198	3-2-44		
R-1535	none		Propeller Bulletin	
R-1690	none		Hamilton Standard	
R-1830	348	2-1-44	none	
R-1830	349	1-12-44	Curtiss	
R-1830	350	1-6-44	13	Being issued
R-1830	351	2-10-44	14	2-22-44
R-2000	58	Being issued	2	Supplement
R-2000	59	Being issued	No. 1 dated	
R-2000	60	Being issued	8	1-1-44
R-2000	61	Being issued	Supplement	
R-2000	62	2-12-44	No. 1 dated	
R-2000	63	Being issued	1-21-44	
R-2000	64	2-15-44		
R-2800	117	Being issued	General Propeller Bulletin	
R-2800	118	2-8-44		
Wright				
R-760	none		1	8-2-43
R-975	none		2	9-2-43
R-1820	349	Being issued	3	10-5-43
R-1820	350	2-12-44	4	12-1-43
R-1820	351	Being issued	5	10-13-43
R-1820	352	3-1-44	6	10-27-43
R-1820	353	2-24-44	7	1-16-44
R-2600	112	1-6-44		
R-2600	113	1-4-44	Power Plant Accessories Bulletin	
R-2600	114	1-21-44		
R-2600	115	2-5-44	1-44	1-24-44
R-2600	116	3-1-44	2-44	2-16-44
R-2600	117	Being issued	3-44	2-3-44
R-2600	118	2-21-44	4-44	1-31-44
R-2600	119	2-24-44	5-44	2-8-44
R-3350	21	Being issued	6-44	2-11-44
R-3350	22	3-1-44	7-44	2-16-44
Continental				
none				
General Engine Bulletin		Date		
5	Revision			
	No. 1 dated			
	3-3-44			
30	Being issued			
31	Being issued			
32	2-15-44			
33	2-23-44			
34	Being issued			
35	2-24-44			
39	3-3-44			



TABLE-TOP ADJUSTMENT SETS FLANGE HEIGHT

cutters. One cutter oscillates back and forth, the other being stationary. As work is passed through the cutter, it is held against table to insure correct height. Oscillating cutter is adjustable for wear by means of two set screws. Front cutter is adjustable up and down to allow for clearance for metals used.

Advantages of this equipment are:

1. Eliminates need of scribing each job before trimming
2. Makes a true cut
3. Needs no further handling
4. Eliminates hand snips on this work
5. Speeds production with safety

The machine was built by taking a conventional Van Dorn Lectro Shear Motor, removing the cutting head and its driving mechanism and installing the newly designed assembly in its place.

[DESIGNED BY SAM GRATCHI]

Save Empty Cartridge Cases Brass on Firing Line Salvaged

NAS HUTCHINSON—A specially devised cartridge rake, produced by the gunnery department, has proved to be a time-saving implement and has in-



MULTI-PRONGED RAKE SCOOPS UP EMPTY BRASS

creased the salvage of cartridge cases on the firing line.

The rake is 16½" wide with 6½" prongs made from condemned wing brace wire, and a 56" handle. One man can rake up the cases which formerly were picked from the sand by five men. The percentage of recovery is also greater, as the job is done more thoroughly with this tool.

Prevents Damage to Stems Cork Removed Easily by Boiling

NAS PENSACOLA—A new procedure for removing cork plug stem assemblies of fuel valves has been proposed in the

beneficial suggestion program to speed up production, prevent damage to stems.

The stem is placed on the hydraulic press and keeper ring depressed on cork until lock wire is exposed. Lock wire and keeper ring are removed. The cork assembly is then placed in hot water, 212° F, for a period of 30 minutes. The shellac binding the cork to stem will dissolve and cork will swell enough to permit easy removal of the cork from the stem.

This procedure eliminates cutting and scraping the cork off the stem, cleaning and reanodizing the metal stem, as was previously done.

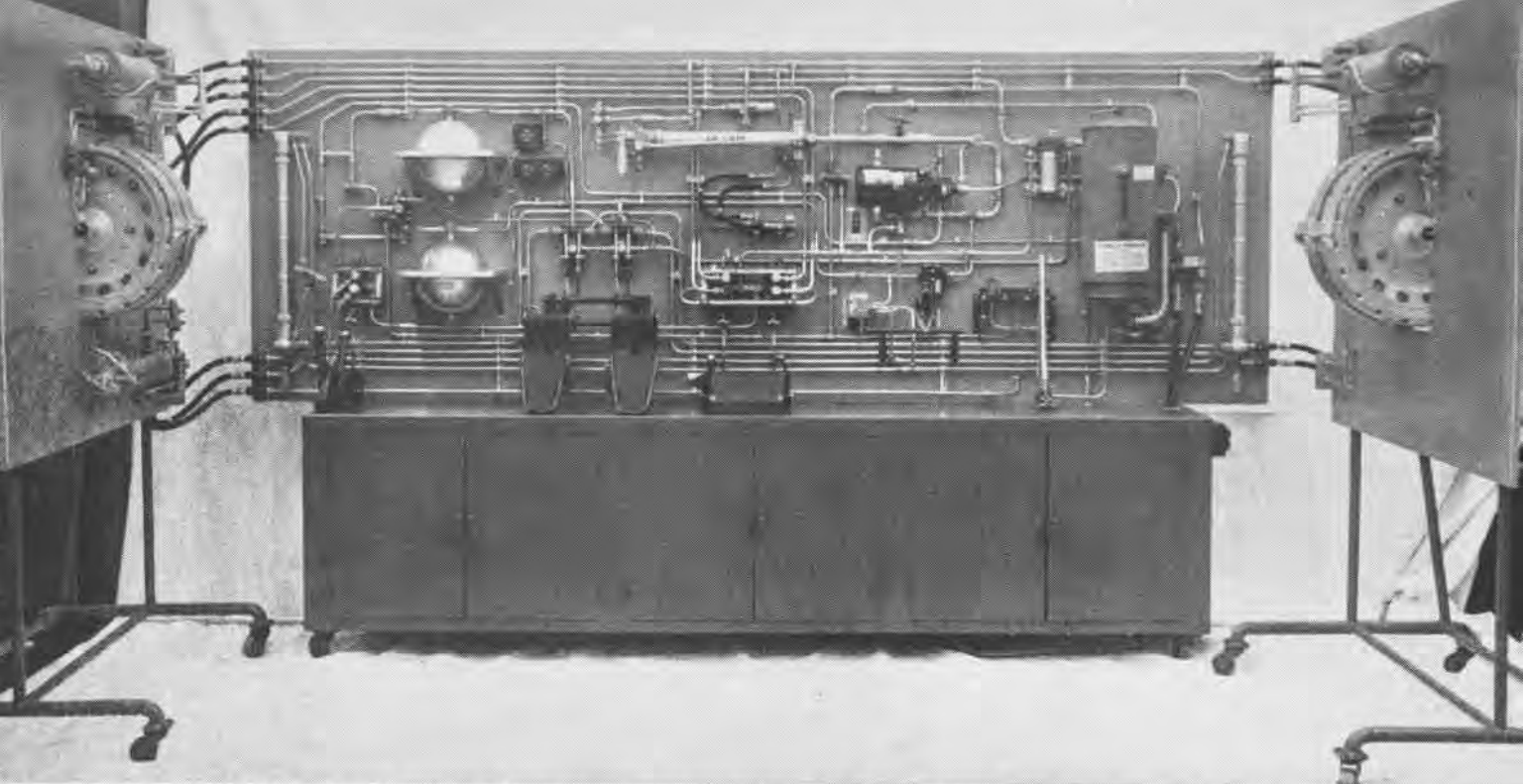
[SUGGESTED BY GEO. FOLBER, AMM2/0]

(Succeeds list of 19 February 1944)

20 March 1944

THE FOLLOWING SHOWS THE NUMBER AND DATE OF ISSUE OF THE LAST SERVICE AND OBSOLESCEMENT AIRPLANE BULLETINS AND CHANGES (CONTRACT CHANGES ARE NOT INCLUDED)

Airplane	Bulletin	Date	Change	Date
F6F-3	32	2-29-44	53	1-23-44
FM-1	22	11-29-43	46	3-3-44
FM-2	2	12-21-43	3	3-3-44
F4U-F3A-FG	39	2-27-44	105	2-28-44
GH-1	7	11-15-43	18	2-18-44
J2F-5	13	8-17-43	15	2-16-44
J2F-6	1	2-25-44	1	2-16-44
NH-1	0		8	3-1-44
N2S-3	20	3-6-44	27	2-22-44
N2S-4	11	12-8-43	8	2-22-44
N2S-5	5	2-22-44	4	2-23-44
OS2N-1	30	2-16-44	33	3-3-44
OS2U-3	55	2-16-44	63	3-3-44
PV-1	36	2-29-44	105	2-16-44
PBJ-1	16	1-27-44	23	3-3-44
PBM-3	33	11-2-43	113	2-26-44
PBM-3C	33	1-21-44	67	2-26-44
PBM-3D	4	2-1-44	4	3-1-44
PBM-3R	29	1-21-44	108	2-26-44
PBM-3S	12	2-1-44	39	2-26-44
PBN-1	2	3-26-44	35	2-15-44
PBY-5	42	12-28-43	150	2-15-44
PBY-5A	50	2-28-44	139	2-12-44
PBY-5B	8	1-1-44	33	2-15-44
PB2Y-3	27	3-4-44	127	2-15-44
PB2Y-3R	26	3-4-44	112	3-1-44
PB4Y-1	38	3-3-44	68	2-12-44
R4D-1	21	2-6-44	23	2-28-44
R4D-2	8	2-6-44	3	1-6-44
R4D-3	13	2-13-44	15	2-21-44
R4D-4	9	2-6-44	3	2-21-44
R4D-5	13	2-22-44	8	2-28-44
R5C-1	11	3-3-44	40	2-24-44
R5D-1	12	2-24-44	58	2-23-44
R5O-5	5	11-19-43	10	2-14-44
RY-1	8	3-3-44	2	12-16-43
SBD-1	57	1-18-44	105	2-26-44
SBD-2	62	1-21-44	114	2-26-44
SBD-3	80	1-21-44	151	2-26-44
SBD-4	35	1-21-44	62	2-26-44
SBD-5	35	3-6-44	55	2-26-44
SBD-6	5	3-3-44	3	1-25-44
SB2A-4	13	1-23-44	92	3-3-44
SB2C-1	29	2-27-44	40	3-3-44
SB2C-1C	15	2-27-44	32	3-3-44
SNB-1	13	2-27-44	20	3-10-44
SNB-2	11	2-27-44	13	3-2-44
SNB-2C	1	2-27-44	5	3-2-44
SNJ-3	27	3-1-44	24	1-5-44
SNJ-4	21	3-1-44	24	2-18-44
SNJ-5	7	3-1-44	6	1-5-44
SNV-1	16	2-28-44	46	2-3-44
TBF-TBM	86	3-6-44	180	3-1-44



HYDRAULIC SYSTEM AND OTHER SYSTEMS OF PB4Y-1 SHOWN ON THESE PAGES WERE CONSTRUCTED UNDER SUPERVISION OF SPECIAL DEVICES DIVISION

AIRCRAFT MAINTENANCE TRAINER

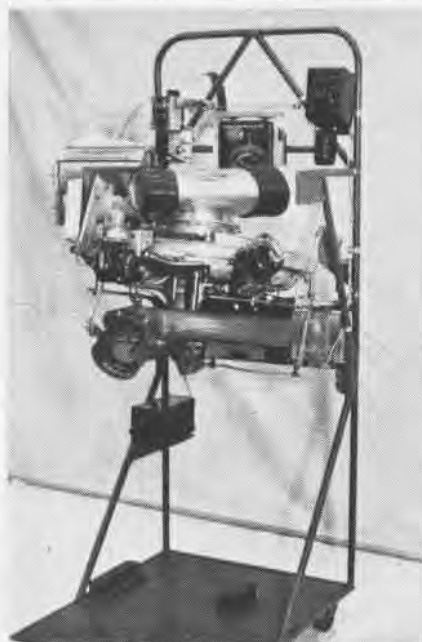
NAVAL PERSONNEL reporting to squadrons from technical schools have been trained in the theory and operation of aircraft systems generally, but in most cases require additional training before becoming sufficiently skilled to qualify as specialists on a particular system of a specific type plane. This necessary specialized training will be provided at operational activities through the AIRCRAFT MAINTENANCE TRAINER PROGRAM initiated 18 January 1944 by direction of the Chief of Naval Operations.

Under this directive, CNO determines the needs of the service in numbers and types of maintenance trainers; BuAer's Special Devices Division supervises construction of the trainers, and Advanced Base Aviation Training Unit, NAS Norfolk, has charge of administration of the trainer detachments in the field. The major commands being served by these trainers must provide personnel to serve as instructors.

Generally, a MAINTENANCE TRAINER will consist of cutaways and working presentations of such essential aircraft systems as hydraulic, lighting, bombing, propeller, instruments, heater, electrical, engine, arresting gear and turbo supercharger. Instructor crews for the trainers will include an officer and from eight to fourteen enlisted men. Each man will

be a trained instructor as well as an experienced mechanic and will specialize in at least one airplane system. Officer and crew will be assigned permanently to the trainer. Where a trainer detachment is scheduled to move from one activity to another, a trailer will be used to carry the components.

Approximately 90 MAINTENANCE

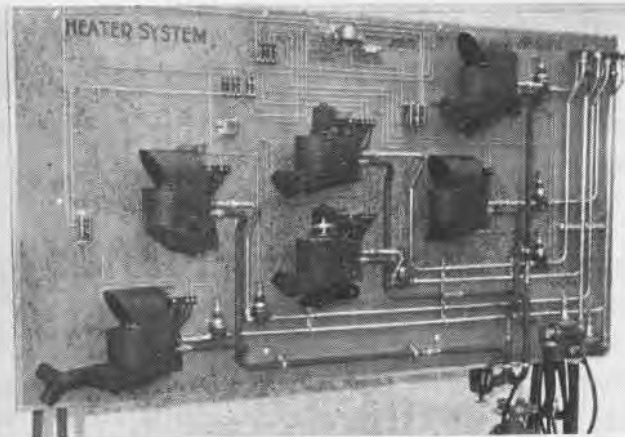


THIS IS PB4Y'S TURBO SUPERCHARGER SYSTEM

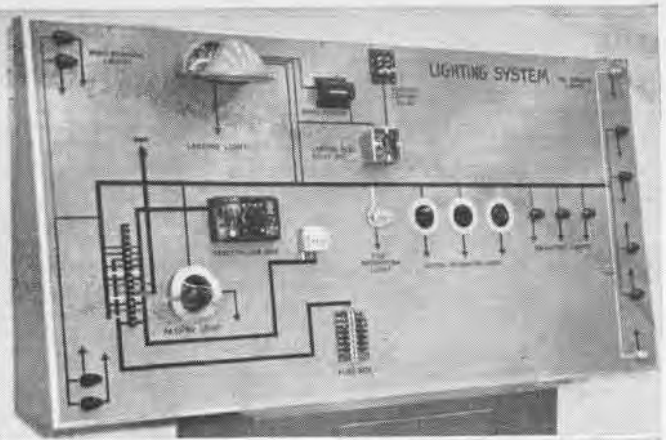
TRAINERS will be distributed throughout naval aviation activities and will include systems for PB4Y, PV, PBM, PB2Y, TBM, F6F, SB2C, F4U, SBD, PBJ, PBY, JM, FM, R5D and RB airplanes. Trainers for new type aircraft will be procured as rapidly as needs dictate. BuAer has contracted for the major number of these requirements and the actual fabrication is under way. ABATU is training instructors, planning curricula and scheduling assignments.

PHOTOGRAPHS on these pages show typical systems selected from a PB4Y-1 MAINTENANCE TRAINER constructed by the Ford Motor Company under the supervision of BuAer's special Devices Division. Activities desiring services of MAINTENANCE TRAINER detachment should submit their requests to ABATU via official channels.

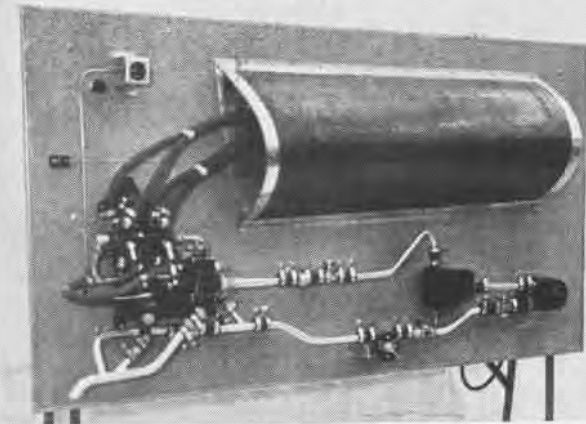
Approximately 2,800 sq. ft. of classroom space is necessary at a station for best utilization of a MAINTENANCE TRAINER. Where adequate housing is not available, the requesting activity can obtain prefabricated buildings (drawing on opposite page) by initiating the request to BuAer through official channels. Shelters will consist of two buildings, each 72' long x 20' wide x 10' to the eaves. They will be placed side by side with a 12' space between.



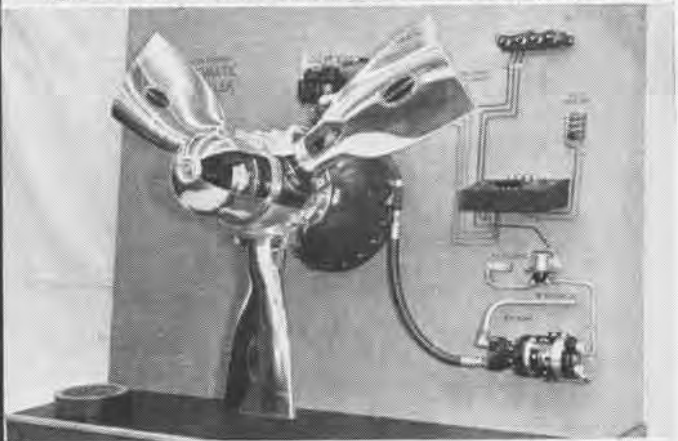
HEATER SYSTEM SPEEDS INSTRUCTION AT OPERATIONAL ACTIVITIES



TRAINER'S PANEL SHOWS ALL PARTS OF EXTERIOR LIGHTING SYSTEM



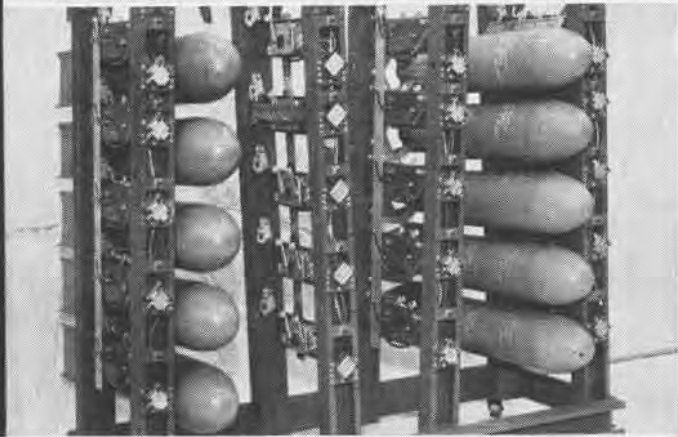
PRESENTATION DEMONSTRATES FUNCTIONS OF PB4Y'S DE-ICER SYSTEM



WITH THIS PANEL MECHS GET CLEAR PICTURE OF PROPELLER SYSTEM



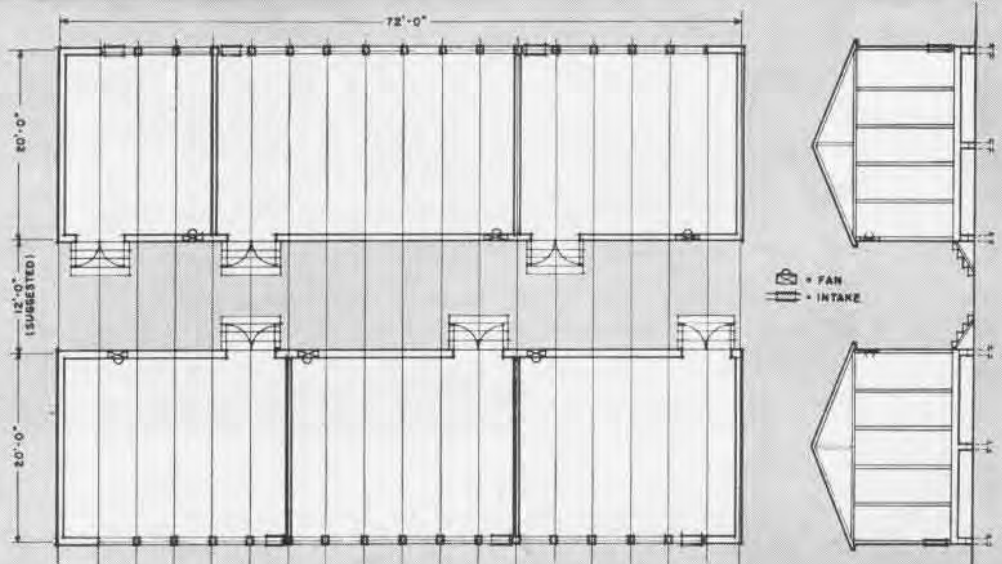
D.C. POWER SYSTEM CONSTITUTES ANOTHER VITAL UNIT OF TRAINER



OPERATION OF BOMB RELEASE SYSTEM DEMANDS SKILLED SPECIALISTS

PREFABRICATED AND DEMOUNTABLE SHELTER

Activities which do not have adequate classroom space for Aircraft Maintenance Trainers should make request for prefabricated shelters to BuAer through official channels



POWER PLANTS

Exercise the Supercharger Clutch

The recent epidemic of engine failures at one activity has been attributed to restricted use of and failure to exercise supercharger clutches in conformance with TN 87-42. Centrifuged sludge causes clutch dragging. This generates heat which aids the accumulation of sludge throughout the clutch assembly and in turn abets dragging. Cumulative result is a heavy deposit of sludge throughout clutch assembly. Deposits break from clutch assembly, enter oil system, and clog sump strainers.

With strainers clogged, oil is breathed overboard, with resultant oil starvation. Deposits in accelerator of Pratt & Whitney engines have become engaged between blades and resulted in complete mutilation of accelerator. Clutches must receive regular exercising to prevent excessive sludge accumulation. TN 87-42 is being revised and reissued as a Technical Order. Revision will contain a note applicable to Pratt & Whitney engines establishing the shift time between positions as one minute, the exercising to be done prior to flight, when it is not practicable to do it at the conclusion of each flight.

RPM Limits for Landing Approaches

The following recommendation has been received from VF-31, originating with VF-23, concerning the RPM to be used for carrier landing approaches in the F6F-3 instead of the full low pitch setting formerly used.

"When set at 2450 RPM, the propeller of the F6F-3 is placed in a positive governing position, so when full power is suddenly applied, the engine does not overspeed. By contrast, full low pitch, with a power setting for the approach at 25-30 inches of manifold pressure, usually gives about 2300 RPM and when full power is suddenly applied, the engine may overspeed as high as 2800 RPM. (Maximum allowable RPM is 2700.)

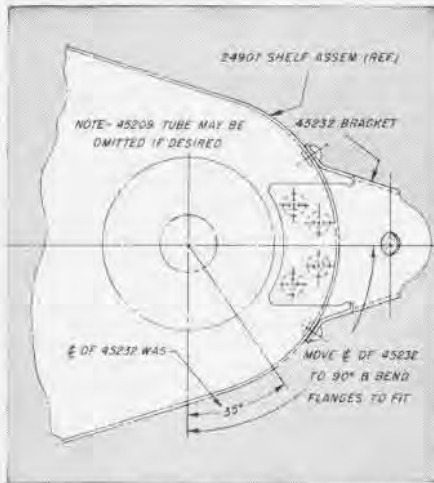
"This overspeeding in full low pitch results in ragged approaches, unnecessary wave-offs, and dangerous settling at the ramp whenever full throttle is applied too quickly, due to overloading of the cylinders and improper combustion. The use of 2450 RPM results in much smoother approaches, fewer wave-offs, and quicker power in emergencies.

"In view of the improved results noted by all squadrons using this method, it is recommended that all carrier squadrons and Carrier Training Qualification Units be notified of the advantages of using propeller RPM in the positive governing range (2450 RPM in the case of the F6F-3) and that they be urged to make a thorough test for possible application of this recommendation to their particular requirements."

The Power Plant Design Branch of BuAer would be interested in receiving further information from activities.

Release Control Relocated Change Authorized in F6F Plane

Service reports reveal that interference exists between the torpedo mechanical release handle and the elevator tab wheel in the F6F-3 airplane. To avoid this interference, the bracket for



BRACKET RELOCATION REMOVES INTERFERENCE

the manual release control has been relocated in BuAer No. 41638, 42014 and subsequent airplanes. The drawing is intended to assist service personnel in making this relocation in delivered airplanes.

Aerological Books Available Should Order Direct From CNO

The following aerological publications recently have been made available for distribution. They may be obtained from the Chief of Naval Operations.

NAVAER No.	TITLE
50-1R-98	<i>Extended Weather Forecasting by Weather Type Methods</i> by Lt. (jg) Robert D. Elliot, USNR, U. S. Weather Bureau, Washington, D. C. February 1944.
50-10R-120	<i>General Climatic Information Guide No. 120, Climate of Biarritz (France)</i> , Restricted, Headquarters, Army Air Forces.
50-1R-99	<i>Meteorological Report on Southern England</i> , Restricted, British Air Ministry, 1942. Reprinted 1943.
50-1R-101	<i>Normal Pressures and Tendencies for the United States</i> , Technical Paper No. 1, U. S. Weather Bureau.
50-1R-102	<i>Some Notes on Forecasting for Atlanta and Miami Districts (North and South Carolina, Georgia and Florida)</i> , U. S. Weather Bureau.
50-1R-100	<i>Summaries of Local Weather Conditions at Barbados, Jamaica, Bermuda and Trinidad</i> , Restricted.
50-1T-10	<i>The Weather Factor in Bombing</i>



50-15R-8	<i>Japanese Targets, Report No. 665</i> , Confidential, Headquarters, Army Air Forces.
NONE	<i>Weather Guide for Long Range Planning—Port Blair, Andaman Islands</i> , Restricted.
	<i>River Conditions in Southern France, Report No. 342</i> , Restricted, Headquarters, Army Air Forces.

ARMY AIR FORCES LOCAL FORECASTING STUDIES

AAF No.	TITLE
600-2	<i>Houston, Tex.</i>
600-4	<i>Miami, Fla.</i>
600-6	<i>Pittsburgh, Penna.</i>
600-23	<i>Walnut Ridge, Ark.</i> Restricted.
600-24	<i>Kingman, Ariz.</i> Restricted.
600-25	<i>Williams Field, Chandler, Ariz.</i> Restricted.
600-26	<i>Stuttgart Army Air Field, Stuttgart, Ark.</i> Restricted.
600-28	<i>Bryan, Tex.</i>
600-29	<i>Abilene Base Weather Station, Abilene, Tex.</i> Restricted.
600-32	<i>Laughlin Field, Del Rio, Tex.</i> Restricted.
600-33	<i>Childress, Tex.</i> Restricted.
600-35	<i>Biggs Field, El Paso, Tex.</i>
600-36	<i>Dalhart, Tex.</i> Restricted.
600-41	<i>Harmon Field, Stephenville, Nfld.</i> NAVAER No. 50-857-1, Confidential.
600-42	<i>Torbay Airport, Nfld.</i>
600-43	<i>Crystal One, Que.</i>
600-44	<i>Dow Field, Bangor, Me.</i> Restricted.

IFF Detonators Dangerous Are Safe When Properly Handled

When IFF destructors are not handled properly, they are a potential source of accidents to both personnel and equipment. Recent accident reports reveal the necessity for exercising greater care in handling and servicing such installations.

When the following precautions are taken these destructors are perfectly safe:

1. Electrical connections should be made to the destructors only after they are locked in position in the equipment.
2. To avoid unnecessary destruction of equipment, the destructor firing circuit wiring should be carefully maintained. The plug pin associated with the firing circuit should be frequently checked for voltage. If more than 0.1 volt appears on this pin, the plug should not be inserted. Leakage across the impact switch has been reported to have caused the destructor to fire under conditions of extreme moisture.
3. The equipment covers should be kept secure with all screws tight whenever the equipment carries a destructor. The sets are built adequately to retain the explosion, provided this precaution is taken.
4. To avoid possible minor injury, personnel should avoid immediate contact with the equipment when the destructor circuit is connected.
5. Destructors should be handled gently. They can be exploded by a severe shock, but are perfectly safe when handled with reasonable care.

The following practices are very dangerous and may result in injury or death:

- a. Making electrical connections to destructor while still holding it in the hand

AVIATION ORDNANCE

INQUIRIES SHOULD BE ADDRESSED TO THE CHIEF OF BUREAU OF ORDNANCE

- b. Removing destructors from equipment without first removing firing circuit
- c. Disassembling the destructor
- d. Testing destructors for electrical continuity
- e. Dropping or roughly handling destructor
- f. Servicing equipment without first removing destructor

IFF destructors are subject to the same rules for handling, shipping and storage as electrically fired blasting caps. They may not be stored afloat with any explosives except other detonators nor in proximity to TNT or other high explosive charges. Ashore they may be stored only with other detonators, detonating fuses or blasting caps. More detailed instructions on the handling of destructors may be found in Bureau of Ordnance Circular Letter No. AV4-44.

This circular letter deals with the problem completely. If a copy is not available, it will be sent upon request.

3 Circuits in Throttle Switch New Mikes Use an Extra Circuit

A new throttle switch, NAF 1124-17, has been designed to provide three-circuit operation. It will replace NAF 1124-11 two-circuit throttle switch. Production tooling has been completed and deliveries are to start in April.

The introduction of new microphones for Fleet use which do not have switches built into them or in the extension cord, requires three-circuit operation to prevent one microphone from energizing another and thus picking up additional noise.

NAF 1124-17 provides a ground circuit. The button and control circuits cannot be energized until the push switch connects ground to these circuits. Other remotely located switches now being furnished provide the same type of operation. A technical note is in preparation describing general wiring for NAF 1124-17 switches. This TN will also describe modifications that may be made to the NAF 1124-11 switch to provide it with three circuits.

ANSWERS TO NAVIGATION PROBLEM on page 28

Cus	157.5°
Speed	39 k
MH	069.5°
PGS	99.5 k
TTT	1027.5
MH	213°
PGS	142 k
Position of turn	Lat. 25° 10' N Long. 161° 22' W

(Tolerances of 2 or 3 miles or 2 or 3 degrees from the answers are considered correct)

Yoke Permits Testing Bomb Release

BuOrd has accepted a locking yoke developed by the Fleet to make the bomb shackle, Mark 5 type, safe to allow testing of the airplane bomb release system without necessity of removing the bombs.

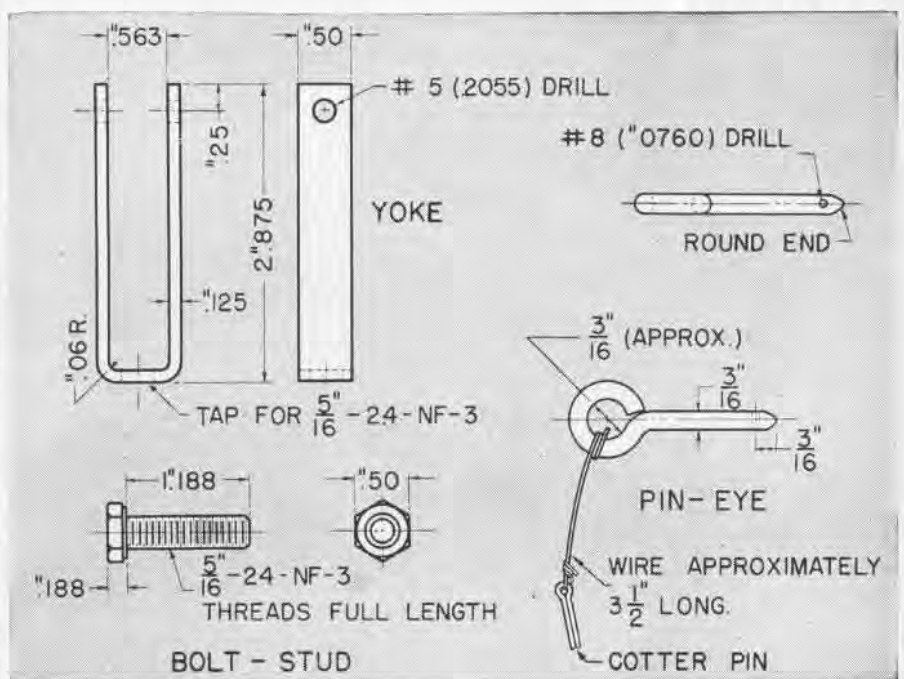
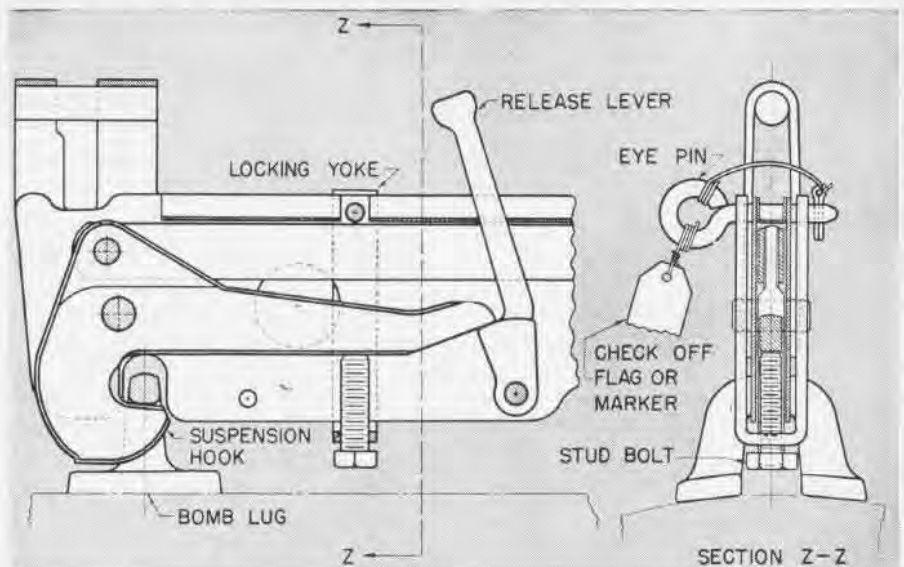
The yoke is simple, easily fabricated, and is readily attached and removed from the shackle. An eye-pin inserted through holes already drilled in the top side of the shackle sideplates just forward of the releasing lever secures the U-shaped channel to the shackle.

The stud bolt threaded through the closed end of channel bears against under side of extension of forward suspension

hook, holding it above the latching or contact area of release lever. This permits operation of the bomb release mechanism and shackle without dropping the bomb.

A red streamer or similar marker should always be attached to the loop of eye-pin to warn operating personnel concerned that shackle is locked. This is an important precaution required to prevent take-offs with shackles in the locked condition.

Future production bomb shackles, Mark 5 type, will have a safety hole drilled through the shackle sideplates, so located that insertion of a tapered pin will lift suspension hook off contact area of release lever. A NavOrd OMI-v, to be issued shortly, will authorize making this change.



LETTERS

PUBLICATIONS

VICE ADMIRAL McCAIN, Deputy Chief of Naval Operations (Air) and Rear Admiral Ramsey, Chief of Bureau of Aeronautics, recently received the following letters from General H. H. Arnold, Commanding General of Army Air Forces:

MY DEAR ADMIRAL McCAIN:

I deeply appreciate your message on the second anniversary of the Army Air Forces, whose members join with me in thanking you and those who serve in Naval Aviation for your cordial remembrance and for the spirit of cooperation you have all consistently maintained towards the AAF. It was most pleasant to receive these greetings from representatives of an arm of the Service whose own record is so brilliant and distinguished.

Very sincerely,
H. H. ARNOLD



MY DEAR ADMIRAL RAMSEY:

I deeply appreciate the telegram of congratulations from you and the personnel of the Bureau of Aeronautics on the second anniversary of the Army Air Forces. The members of my command join me in thanking you for your pleasing remembrance and for the most valuable and cordial assistance you have all given the AAF during these years.

Sincerely yours,
H. H. ARNOLD

¶ The views of the writer of this letter are considered so appropriate that his remarks are reproduced here.

SIRS:

The well-worn phrase "Eternal Vigilance Is the Price of Liberty" is restated here to emphasize for everyone the vital importance of the Navy's policy of security. The conviction of certain victory possesses in itself backfiring qualities. One involves dangerous relaxation of security consciousness—that would lead to a weakening of the safeguards that we threw around us when the prospects were blackest.

Every ship and every station has copies of directives that prescribe the limitations of what can be said and done. These directives are available for the information

of all hands and, what is more important, for their guidance.

The work of months can be undone through loose talk and writing, to say nothing of the consequent needless loss of life and the peril to our war effort. Those of you who have been on the firing line appreciate the fact that you are up against a tough and resourceful enemy whose scientific approach to the manifold problems of warfare compares favorably with ours. When you come home on leave, do not let the sense of distance from the enemy or your desire for acclaim lull your sharp perspective on security matters. The ear of the enemy is everywhere.

Remember, if you feel that your literary urge must be given expression, do so only after consultation with your senior officers and those officers specifically charged with the duty of carrying out the security policy. To do otherwise endangers not only yourself but your shipmates and your country. Moreover, do not write or discuss operations, the use of equipment that you well know falls in a classified category, the methods employed in combating the submarine or the ground defenses against aircraft. Do not assume that because you use this equipment the enemy is aware of its presence or its efficiency.

For you in shore billets, bear in mind that the high command is fully aware of the work being accomplished in your department or bureau and that any public exploitation is usually unwise and dangerous. The Navy has established a public relations bureau expressly for the purpose of telling the Nation what is going on, consistent, of course, with security.

In conclusion, leave the telling of things to those authorized to do so. Your first duty is to the Navy.

CAPTAIN, USN

Navy Department

SIRS:

Bureau of Naval Personnel Circular Letter No. 28-43, paragraph 3, stated that "Personnel of any rating other than aviation branch attached to and serving in the air department of carriers for a period of not less than three months under operating conditions shall wear the aviation general utility specialty mark as a distinguishing mark."

Has the above ever been modified to include personnel of ratings other than the aviation branch serving with patrol squadrons?

YEOMAN 1c

VP 209

¶ NavPers CL 28-43 has not been modified and it is necessary for personnel to be attached to and serving in the air department of carriers before being entitled to wear aviation specialty mark.

Revisions Give Handbooks New Life

In March, BuAer distributed a pilots' handbook and an erection and maintenance manual for the PV-2 airplane. This was the first time BuAer was able to distribute technical handbooks to the field in advance of delivery of the first airplane.

Until the day the PV-2 has become obsolete and is discarded, the airplane will be subject to constant changes as a result of flight tests, combat experience and design improvements. In the same manner, PV-2 handbooks will be subject to constant changes to keep pace with the airplane.

Handbooks distributed in March contained all information available at the time the books went to press. However, the day after the books went to the printer and on every day thereafter, additional information became available. This information was, and will continue to be, distributed to the field in the form of revision pages.

A handbook is only as up-to-date as its most recent revision. It is important, therefore, that books be carefully checked to determine whether they contain all the latest revisions. The status of a handbook can be determined by checking the *NavAer Index of Publications*, the title page of the handbook and revision list on second page.

Reproduced here is the title page of the original handbook. It carries only one date in the lower right-hand corner, and no revisions are listed on the second page. Revision pages are issued to be inserted in the original handbook. One of



the revision pages is a new title page, as shown in the accompanying illustration.

After the revision pages have been inserted, the handbook is a revised book with a new title page, on which both the original date and revision date appear in the lower right-hand corner. When several revisions have been incorporated into the original handbook, the second page lists the pages revised.

By comparing each revision date listed with date at bottom of page, it can be determined whether book is complete. If not, revised handbook should be ordered.

From time to time, BuAer will reissue the handbook, incorporating all revisions, re-numbering pages, etc. This handbook will carry only one date, will supersede all previously issued handbooks and revisions, and will be subject to revisions in the same manner as the original handbook.



BEST ANSWERS

to questions on page 9

1.c 2.a 3.b 4.c 5.c 6.c

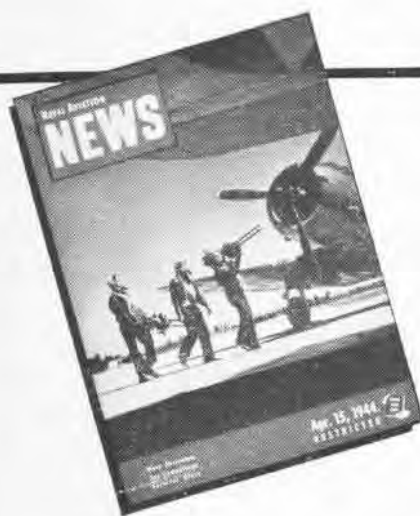
IF YOU HAVE IDEAS . . .



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Methods and techniques that have proved their worth in actual practice. Others want to know.

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Ways and means of keeping down accidents, thus saving lives, avoiding damage to equipment.

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Actual experiences that contain helpful hints to other pilots and crews flying Navy planes.

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If you have developed something workable in safety, survival and technical procedure, let NAVAL AVIATION NEWS get it out to other naval air activities. NAVAL AVIATION NEWS comes out twice a month and reaches the entire aeronautical organization all over the world. It also publishes developments at naval air activities and information about the enemy falling within a RESTRICTED classification.

So if those ideas you've been hoarding are informative and of interest to other squadrons, send them to NAVAL AVIATION NEWS direct. Also send photographs that are fully captioned and ready for publication. See, above, how to address envelope direct to NAVAL AVIATION NEWS.

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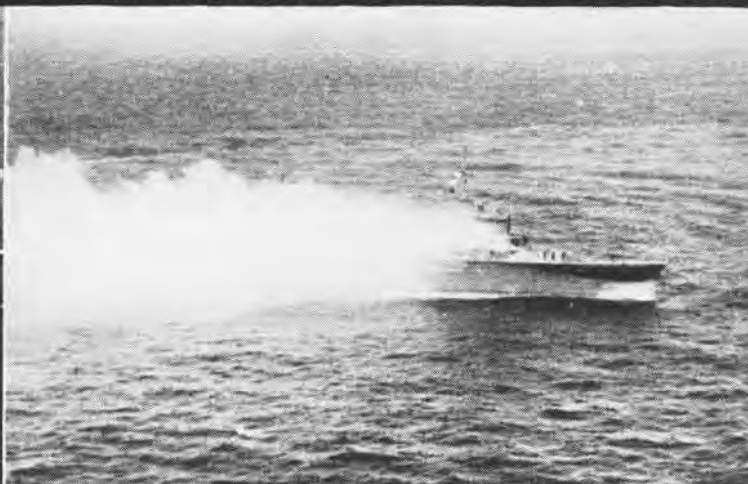
NAVAL AIR OVER TRUK

After the Navy stabbed into the Marshalls and disarmed Kwajalein on February 1, its tremendous fighting might was hurled against the unsuspecting Japs at Truk, Caroline stronghold. Carrier-based planes diving out of the skies sprayed loss and destruction on warships, merchantmen, harbor installations. The Navy's bold and decisive action was acknowledged by Tokyo, where Jap army and navy chiefs were promptly relieved of their responsibilities.

JAP SHIPS OFF EATEN ISLAND ATTEMPT FLIGHT FROM TRUK HARBOR



BLAZING JAP CRUISER LISTS FOLLOWING DIRECT HIT BY NAVY PLANE



SEAPLANE BASE ON DUBLON ISLAND DRAWS WRATH OF NAVY PLANE BOMBING. NUMEROUS JAP PLANES ARE DESTROYED ON GROUND AS ENEMY IS CAUGHT

