NAVAL AVIATION

NEWS

Jap Barricades • CASU
Technically Speaking
Pettibone • Ditching

Sept. 1, 1944

RESTRICTED

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Three Japs jumped them...

WILLIAM J. MOAK, AMM2c, was turret gunner of a TBF during the February 16 raid on Truk. The *Avenger*, piloted by Ens. L. E. B., had damaged a cruiser, later sunk by our battleships, and after bombing a cargo ship was jumped by three Jap fighters.

The Japs made between 12 and 15 passes at the lone, slow torpedo plane. On the second pass, a burst of gunfire struck the side of Moak's turret, showering him with glass and metal splinters, wounding his right arm and side of his face and temporarily blinding his right eye. The radioman was mortally wounded by the blast.

The pilot dived to water level and jinked violently, throwing Moak's ammunition out of its boxes. Moak gathered the shells in by hand and kept his gun firing by holding the ammunition with his good arm and firing with the wounded one. Three times he had to descend to the radioman's compartment to put out a fire which wind rushing through the hole in the fuselage kept re-igniting. He pulled the wounded man out of the flames and returned to fire bursts at a Jap fighter, which he learned later from the pilot went into the ocean. The other fled from his fire.

Once the .30 cal. ammunition from the radioman's guns began to explode from the heat and Moak pulled out the bullets with his hands, pushing all burning material out the hole in the fuselage.

The pilot finally shook off the pursuers and brought the torpedo plane back for a crash landing on the carrier. Both men were flying again when Air Group Five hit Palau. Moak's feat in keeping his guns firing against such difficult odds was one of the outstanding aircrewmen stories told to date.

Aircrewmen have what it takes!

No. 7 of a series

PHOTO INTERPRETATION

JAP BARRICADES

When the American forces landed on Betio Island, Tarawa, they were forced to overcome all the varied types of water and land barriers the Japanese had conceived to protect themselves on the "island carrier." The Japs had hoped to completely surround their fortress with water and under-water hazards to make it as difficult as possible for landing troops to approach from any direction. Carefully relating their barrier defense to natural barriers such as coral heads, sand bars and reef fringes which already existed in the surrounding waters, they used materials at hand to construct their outer defense, constructing barriers of coconut logs, coral rocks, masses of floating rags which can stop the screws of a landing barge, and floating booms sometimes anchored, sometimes merely loosely bound together. Next came the rows of concrete anti-tank obstacles which directed amphibious tanks to certain "open" areas, which were heavily mined with anti-tank mines. Zig-zag rows of barbed wire led assaulting troops toward spots which were heavily protected by machine gun fire from the beaches still to be crossed.

The Japs could count on having the invaders run the gamut of these defenses, because of the reef fringe ranging from 2,000 to 5,700 feet off shore and a gradually sloping sand beach averaging fifty feet. At high tide half this beach is under water, and hazards were partly or entirely covered, making it doubly dangerous.

Close-up of seaward side of antiboat barrier made of logs in the shallow water of Betio beach. High tide raises water three feet

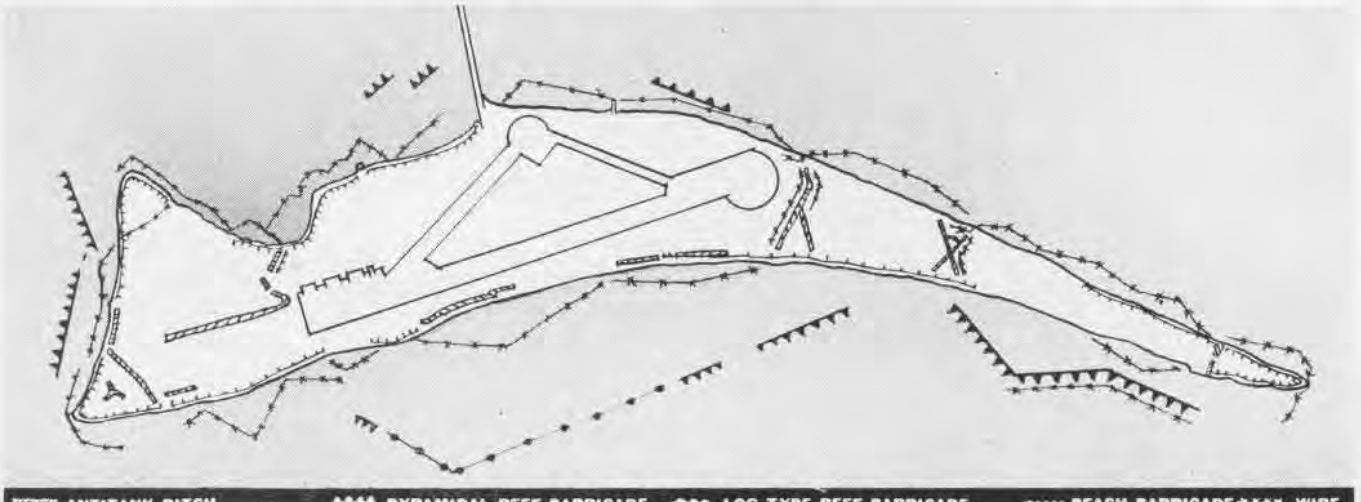
Antiboat mine of a type used by the Japs in combination with concrete pyramidal and log barricades to slow up approach to beaches

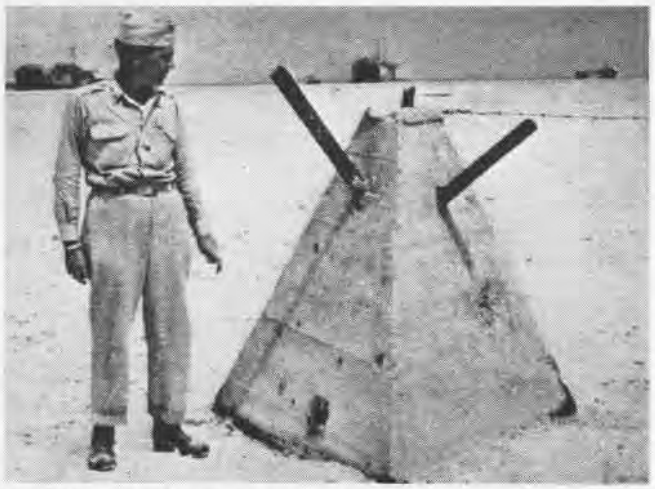
WATER BARRICADES ARE DESIGNED TO PREVENT OR IMPEDE LANDINGS ON ENEMY HELD ISLANDS AND BEACHES

ALL WATER OBSTACLES used by the Japanese are not premeditated. In recent raids, effective barriers have been sunken ships, native rock fish traps, rock jetties, coral heads, and sand bars. Even fish nets have acted as under-water entanglements, impeding landing forces. Other types of barricades, such as antiboat mines, require more long range planning, but the Japanese realize the effectiveness of these barriers, even though they are not as tactically perfect as those which can be made of materials at hand.

Unique to Betio Island was the coconut log type of boat barrier. It is seven to eight feet high and of very sturdy construction. Wave action had no effect on it. In shallow water it was often flanked by concrete pyramids from four and a half to five feet high. These simple barriers are cheap to produce, and are cast in molds on shore. They are not fixed, but left loose on the coral, where their weight holds them in place. If the invasion had not stopped the work, the entire island would have been circled by this type barrier.

The Japanese also made very effective use of antiboat mines, and in some cases these were placed between the concrete pyramids, and heaps of coral boulders were piled between these barriers as additional snares. It was probably their intention to carry out this pattern all around Betio Island. The sketch at the bottom of the page shows the scheme of barrier defenses the Japs worked out on Betio Island, and the way in which these barriers were related to one another around the entire perimeter of the island. Below the sketch are ground views of four typical types, the antitank ditch, pyramidal reef barricade, log type reef barricade, and barbed wire barrier, used by the Japanese in the Pacific.





Pyramidal barricades have a triangular arrangement of steel beams set in concrete. These barriers form the outer defenses of islands

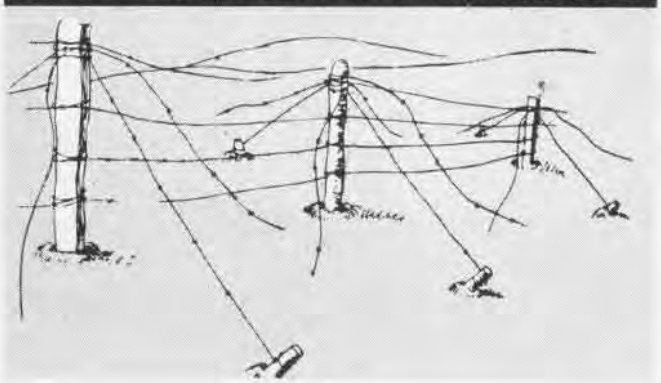
BARRIERS TRAP TANKS, PERSONNEL

THE ABOVE close-up view of one of the antitank barricades used by the Japs at Betio shows the marks of the wooden forms used in pouring these concrete pyramids. The three steel beams set into the concrete in a triangular arrangement projected above the water level and acted as hazards for tanks and landing craft approaching the shore. Anchoring posts at various intervals stretched strands of barbed wire across the tops of these pyramids, which were arranged in zig-zag lines in groups of three with a slight space between the groups. These spaces were filled either with piles of coral boulders cemented together into jagged under-water obstacles, or by antitank mines.

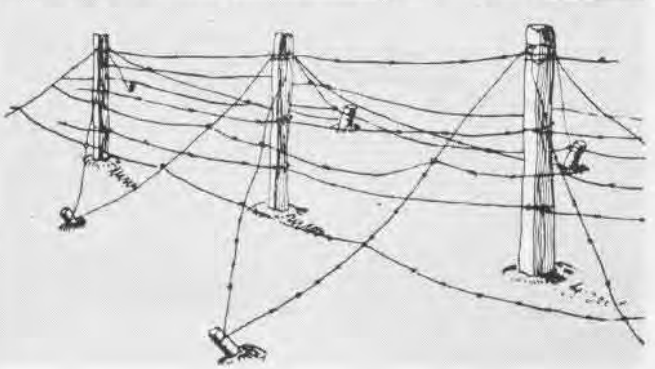
The four-strand barbed wire fence running in jagged lines at the edge of the beach was the last line of under-water defense at Betio. This was designed to slow up the speed of invading troops coming ashore from landing craft, and to direct these troops toward certain spots on the beach which were heavily protected by gun positions manned by the Japs, and so placed as to have fields of fire parallel to the wire. This particular type of barbed wire fence is usually from two and a half to three feet high and has no appreciable width. The fence pictured above had lateral guy wires, but in other locations, the same type of fence has been found without these supporting wires. These loose wires dangling from the supporting poles are typical, and add to the effectiveness of the fence as a personnel barrier. In this instance there was only one fence off the beach, but at Mili four parallel fences about fifteen to twenty feet apart formed a strong defensive belt. However, four strand fence is commonly used only when there is a scarcity of materials or time prevents the erection of double apron fence or high wire entanglements. All types are used by the defenders.

THE LOWER photograph at right, taken from the beach at Betio, looking seaward, shows the location of double apron wire between antitank pyramids and the shore. This type of wire fence is usually two and a half to four feet high and ten feet wide. On Tarawa it was used in single fences, but it has also been found in multiple arrangements with fences five to fifteen feet apart. It is generally used between the skullies or boat barriers and the shore, in zig-zag lines in the water just off the beach, in positions flanking tank traps arranged so that the wire forms an extension of the trap, and in rings around coastal batteries, for extra protection. These barriers are designed to trap the invaders.

LOW TIDE AT TARAWA REVEALS BARBED WIRE IN A ZIC-ZAG PATTERN



DOUBLE APRON WIRE IS PLACED BETWEEN PYRAMIDS AND SHORE LINE

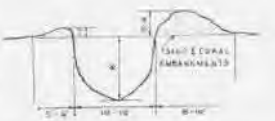


LAND OBSTACLES AND BARRIERS PROTECT GUN EMPLACEMENTS, RETARD THE PROGRESS OF INVADING TROOPS AND TANKS

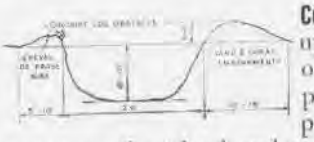
ACROSS THE BOTTOM of this and the following page are photos of some of the most common types of barricades which the Japanese construct on land: wire entanglements, antitank ditches, coconut log barriers, and sea walls. Usually these are closely related to one another to form a close-knit system of hazards. The construction of some of these Jap barriers is analyzed here, in the accompanying sketches.

High double apron wire is one of the four principal types used by the Japs. It shows up in vertical photos as a hazy band having considerable width. Posts are braced either with guy wires or with oblique struts of wood. This type of wire fence is often used as an extension to antitank ditching, sometimes arranged in a zig-zag pattern, and is found both in the water and on land. The Japs often use this type of fence in multiple arrangements of several rows.

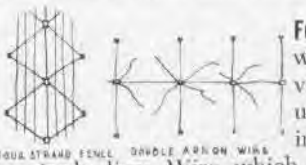
Low wire entanglement is another principal type of wire barrier. It is usually one to one and a half feet high, with posts about six to ten feet apart, forming a band twelve to thirty feet wide which borders on tank traps or surrounds pillboxes. Posts of low wire entanglements cast such small shadows, it can seldom be seen in aerial photos, but ground studies reveal it often is used near important installations.



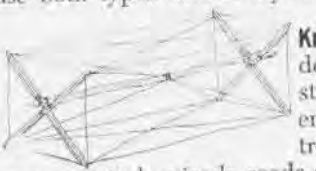
Antitank ditch shown in cross-section by sketch was found on Ocean Island. The area between the ocean and antitank ditch was fortified with pile-post obstacles and bands of low wire thirty feet wide. Sand and coral were piled up to form embankments on either side of the eight foot deep ditch, to throw the tank at a steeper angle, making it more difficult to extricate itself after being lodged there. On Betio Island, tank ditches crossed open spaces not protected by log barricades. Because of a water table existing some eight to ten feet below the surface of the sand, the tank ditches at Betio were of a shallow design, ranging from five to seven feet deep, as much as twelve to fourteen feet wide.



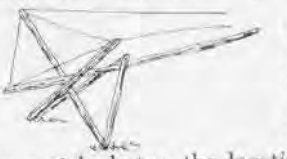
Coconut log barriers are used to back up antitank ditches such as the ones found at Makin. The pattern across open cleared pattern across open cleared spaces on the island and were well protected by machine gun installations. The cross-section shown at left is an antitank ditch found on Nauru Island, in the Gilberts. This ditch, which more or less paralleled the beach, had an embankment of sand and coral with protruding coconut logs.



Four strand fence and double apron wire barriers are shown in plan view. The four strand is often used without supporting wires, in which case it appears in plan as single line. Wire which appears in vertical photos as broad band may be either high wire entanglement or series of double apron fences, more probably the former. The Japs use both types extensively in constructing strong defenses.



Knife edge wire barricade or cheval-de-frise is frequently used to stop temporary gaps in wire entanglements, to barricade trenches leading toward the enemy, and to barricade roads and streets. They may also be used as an under-water obstacle in beach defense, and to blockade landing strips to prevent planes from landing. These are usually the portable type cheval-de-frise, constructed out of trees, logs. Barbed wire adds extra hazard.



Cheval-de-frise of simple type with cross supports and barbed wire is incorporated in beach defenses at Betio Island, effective in directing the movement of troops. In aerial photos, the location of wire with respect to other installations usually gives the best clue as to construction.

Tank ditch is located just inshore from the beach at Betio Island. Just beyond, barbed wire fences protect beach from invading troops

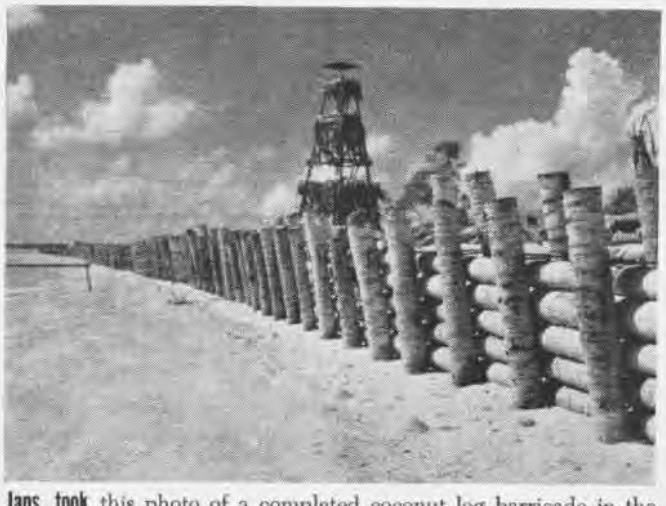
Low wire entanglement on Makin Atoll lies parallel to the antitank barrier in background. It usually forms a band 12 to 30 feet wide

CAPTURED JAPANESE PHOTOGRAPH SHOWS WORKMEN BUSY PREPARING CONSTRUCTION MATERIALS FOR THEIR ISLAND FORTIFICATIONS AND DEFENSES

OBSTACLES CIRCLE JAP ISLANDS

JAP WORKMEN prepare the materials for fortifying one of their island strongholds, in the captured photograph above. Modern equipment simplifies the task of building adequate defenses. Another captured Jap photo, below, shows a completed sea wall of coconut logs before it was stormed and captured. Amphibious forces in the Pacific are becoming familiar with the entanglements of barbed wire, antiboat, tank and personnel obstacles through which they have had to hack their way while ships and planes shell the enemy in foxholes, trenches and well defended shelters.

Sometimes it has been possible, through heavy aerial bombardment preceding an attack, to destroy many of the enemy's defenses, greatly lessening the number of American lives which must be sacrificed breaking through natural and man-made obstacles with which the Japanese have surrounded their island fortresses. All of the various barriers which the Japs have conceived are intended to slow down the American invaders so that Jap snipers and machine gunners can harass him from fortified positions. The forces defending an island outpost have the advantage of sheltered positions, and an interrelated system of barricades and defenses calculated to direct the movement of the invading forces toward points which are most heavily fortified or protected by machine gun fire. American forces have advanced into Jap held territory, shattering their island defenses.



Japs took this photo of a completed coconut log barricade in the form of a sea wall along beach. Shows use of materials at hand

Permanent type of sea wall construction is built by the Japanese with boulders set in concrete and barbed wire fence along the top

GRAMPAW PETTIBONE

Bow-Legged Student Is Preferred

After a student had made a cross-wind, small field shot, the instructor took over the controls for the take-off. The student relaxed in the rear seat with his feet flat on the floor and his knees bent inward. At this moment, the instructor pulled back on the stick to get into the air quickly to clear obstructions at the up-wind end of the field. The student's left knee became jammed between the stick and the seat. The harder the instructor pulled back on the stick, the more impossible it was for the student to get his knee clear.

The airplane ended up in a heap on the other side of the fence.

Grampaw Pettibone says:

Jamming the controls is a very old trick students developed for upsetting their instructors. Those with big feet jam the rudder controls and those with knock-knees jam the elevator controls, like the student above.

The only way I know to cure the rudder jamming artists is to catch them when they are young and bind their feet, as they used to do with Chinese women. I've invented a device, however, which is guaranteed to prevent knock-kneed students from jamming the stick. Hit 'em over the head with a fire extinguisher.

Cockpit Tips For Combat

After a recent strike, a carrier squadron suggested, as a defense against breathing smoke when the aircraft is on fire, and for general protection of the face, that the oxygen mask, with diluter valve turned to OFF, be worn at all times within range of enemy AA fire.

It also was pointed out that some injuries resulted from shattered glass in the cockpit enclosure. It therefore was suggested that goggles be worn on combat runs to minimize this danger.

Flight Leaders' Responsibilities

A good flight leader must have the confidence of his wingmen and he will only have that insofar as he demonstrates he is always watching out for their welfare. For one thing, the leader of any group of planes is solely responsible for insuring that his flight has adequate clearance from outside hazards. The following cases illustrate what happens when this is not done.

Case 1. Two three-plane sections took off from adjoining fields to rendezvous. One section violated local flight regulations by flying above the prescribed formation altitude and by flying in a restricted area over the other field. One section was in a climbing right turn and the other section was descending in a shallow right turn when the number three man in each section collided. One pilot was killed when he crashed out of control; the other was able to make an emergency landing.

Quite obviously, neither of these flight leaders, both of whom were instructors, was keeping proper lookout for other aircraft. Wingmen are too busy maintaining position to be able to detect and take individual action to avoid such hazards.

Case 2. A carrier air group was engaged in a training flight to develop fighter escort tactics. A section of fighters crossed in front of the formation of bombers. During this maneuver the wingman of the fighter section collided with the wingman of a section of the bombers which were being escorted. Both pilots involved in the collision were killed.

Since the bombers were not maneuvering, responsibility for this collision must rest with the fighter section. The report was not clear as to why the fighter section was flown so close to the bombers, but this again is the leader's entire responsibility. His wingman is largely occupied with maintaining his position on the leader. The wingman of a fighter escort group should also keep a sharp lookout for enemy aircraft which he cannot do unless he has absolute confidence that his flight leader will not lead him into situations similar to the one outlined above.

Brakes Freeze

Upon contacting the runway in a normal landing attitude, the right wheel of an F6F appeared to be frozen. The pilot managed to hold the airplane straight until it had slowed down; then it turned over on its back. An immediate inspection revealed the right wheel to be fully locked. Further investigation showed all except the outside brake discs to have annealed.

It was the opinion of the trouble board that the pilot in taxiing to the take-off position, a distance of about seven-eights of a mile, through use of excessive RPM and improper use of the brakes, caused the brake discs to heat to such a temperature that they froze immediately after take-off.

▶*COMMENT*—Brakes are installed primarily for controlling aircraft on landing. Abuse of brakes, such as in the above case, invariably leads to trouble.

Brakes *must* be used intelligently. Read Technical Order 49-42.

Cheating On Flight Regs

While on a familiarization flight, a pilot put his N2S plane into an intentional inverted spin at an altitude of approximately 3,000 feet. Although the pilot applied full opposite control, the plane continued its spin and at 1,000 feet, both pilot and passenger parachuted safely. The plane was completely demolished in the crash.

The trouble board assigned 100 per cent error to the pilot for starting the maneuver at an insufficient altitude to effect a complete and safe recovery.

▶*COMMENT*—Compliance with article 13-124(b) of BUAer Manual, which requires a minimum of 4,000 feet for practicing inverted spins, might have prevented this accident.

Safety regulations for airmen are based on millions of hours of flying experience.

Teamwork is as vital to the members of a plane crew as it is to these men running three-legged race as part of victory celebration staged aboard a carrier after Saipan invasion

Use Best Tank

An SBD pilot *thought* he had plenty of gasoline in the right main tank, but did not bother to check the quantity gauge when given the "check-fuel-and lower-wheels" signal prior to landing. About 400 yards short of the runway, the engine cut out and the pilot was forced to land in a swampy area, causing major damage to the airplane. Upon subsequent examination, the right main tank was found dry. Ample fuel remained in the other tanks.

▶*COMMENT*—As recommended in Flight Safety Bulletin No. 7-44, "your best tank" should always be used for landings, take-offs and other low altitude flying. That this is not being done consistently is shown by accident reports.

During a recent three-months period there were 29 accidents reported as caused by failing to shift tanks, shifting too late or using improper procedure. While no pilots were killed in these accidents, five were seriously injured and six received minor injuries. Thirteen of the airplanes involved were completely destroyed, nine required major overhaul and seven had major parts replaced. Review Flight Safety Bulletins 7-44 and 25-44.

Aviation Accident Report Forms

Reports from the field indicate that in some cases confusion exists due to the distribution section at the end of NavAer 339A. This form is just what the instructions say it is—a worksheet to assist in obtaining complete information to be transcribed on NavAer 339. The distribution section was put in Form 339A to assist the Accident Board in compiling and distributing NavAer Form 339 with proper enclosures.

On NavAer 339, space is provided to assign percentages to pilot error, other personnel, material, with miscellaneous as the immediate cause. Directly below, space is provided for a break-down of this assignment. To conserve space the entire break-down was grouped under contributing factors. For example, a 100 percent pilot error accident may be broken down into 50 percent error of judgment, and further assigned to lack of recent experience as the underlying cause, while the other 50 percent may be assigned to poor technique with undue haste as the underlying cause. Likewise, an accident attributed 75 percent material and 25 percent miscellaneous may be broken down as 50 percent structural, 50 percent landing gear (maintenance inspection) while the 25 percent miscellaneous may be further assigned to airport, terrain, etc. A break-down to this extent is necessary in order to initiate corrective measures.

Tragedy of Errors

An SBD was just about to become airborne on take-off when the engine cut out momentarily then caught again. The pilot attempted to continue the take-off, but a second or so later the engine cut out and started twice again in rapid succession with a complete failure at about 60 feet altitude. The pilot immediately commenced a steep left turn to get back into the field but stalled out and crashed in a fatal spin.

The Trouble Board said: "If the pilot had cut his engine when it first showed signs of not functioning properly he could have easily stayed on the field and avoided the accident. *His fatal mistake was in attempting a steep turn at such low airspeed.*

"An inspection of the plane after the crash disclosed two other significant pilot errors which, although not bearing directly on the cause of the accident, showed that the pilot violated other safety rules. His shoulder straps were behind his parachute back pad, showing that he had ignored them when getting into the plane. The fuel selector valve was on the right auxiliary tank, which showed that he had not followed the check-off list.

"It is the opinion of the board that a forced landing was inevitable and a minor crash probable as the result of the engine failure. It is, however, our further opinion that the pilot showed poor judgment and poor technique, which resulted in the loss of his life."

Ditching Drills Pay Off

While flying a routine inshore patrol the engine of an SBD failed, necessitating a forced landing at sea. Here is the pilot's statement:

▶"After heading my plane into the wind, I dropped the depth charges, then checked my navigation. During these few minutes, my radioman sent a 'returning to base' message and a distress MAY-DAY call with our position. I lowered my flaps and made a full stall landing. The jolt of the landing was terrific. *Orchids to shoulder straps!* During the period of approximately 45 seconds while the plane stayed afloat, I managed to open the hood which had jammed shut during the landing and joined my ARM who had already removed life raft.

"The significant factor and the success of this forced landing was the exactness

with which my radioman carried out the proper forced landing procedure in accordance with our *pre-arranged* plans. From the moment he was aware that we were having engine trouble, he had the transmitter turned on and warmed up. He had time to transmit distinctly the two messages. As we found out later, both were received. Before the plane hit the water, he was out of his 'chute ready to abandon ship. As soon as the plane stopped in the water he did not waste a second in removing the raft from the plane. Because he remembered what he had been taught regarding the operation of the raft and the use of articles stowed aboard, he was a definite asset in the life raft during our fifteen hours afloat."

Remove All Specks

The pilot (1,414 hours) of an HE-1 was attempting a landing on a roadway in order to pick up a doctor and transport him to the scene of a crash. Everything was okay until the airplane ran off the side of the road during the landing run. The pilot said that his vision was impaired by a dirty windshield and that he could not see exactly what he was doing. *The windshield had been wiped with an oily rag.*

Grampaw Pettibone says:

The trouble board assigned 100 percent carelessness to the pilot for taking off with a dirty windshield. I go along with the trouble board 99 percent. The other one percent, plus a few hours extra duty, should have been assigned to the plane captain as a reminder that when his plane is certified as ready for flight this should include a clean windshield.

I know one fighter pilot who now makes certain his windshield is absolutely spotless. One day, near the end of a combat patrol flight, he saw two planes in the distance. Knowing they could only be enemy, he signalled his wingman and gave chase. He was unable to close the range, however, and was almost out of gas before he discovered that the two enemy planes were but two dirt specks on his windshield.

DILBERT DUNKER AT TOP OF 30-FT. SLIDE, READY TO GIVE CADET PRACTICE IN GETTING OUT OF COCKPIT UNDER WATER DEVICE BUILDS CONFIDENCE

DUNKING

Dilbert Machine Gives Cadets Taste of Crash Landings in Aircraft

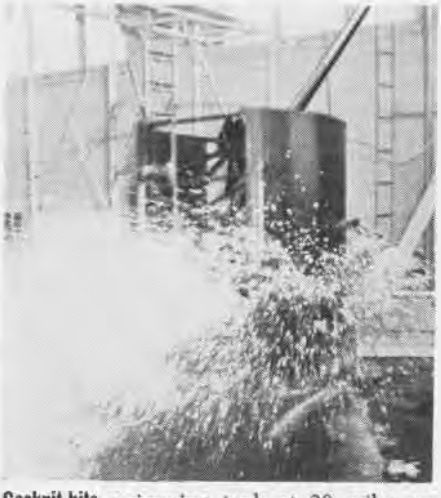
AVIATION cadets at NAS Pensacola get a taste of what it feels like to bring a plane down in the water when they ride the "Dilbert Dunker" as a part of the station's physical training, safety and survival program.

Constructed of a surveyed SNJ-3 cockpit, complete with shoulder straps and safety belt, the machine shoots 15 feet down a 45° incline. When it hits the swimming pool waters, traveling at a rate of 20 miles an hour, an automatic trip flops the cockpit over and the student goes under the water upside down.

First trippers usually register fear, but a survey of "veteran" dunkers showed recently that out of 311 riders, 306 expressed approval of the device as an aid to training them in how to get out of a cockpit. It also demonstrates vividly the value of shoulder straps in crash or water landings.

The machine is a revised version of a "Dilbert Dunker" at Corpus Christi [NANEWS, 1/15/44] and is operated mechanically to simulate actual crashes.

Just before cockpit hits water, trip flops it over and pilot climbs out upside down



Cockpit hits swimming tank at 20 miles an hour, demonstrating shoulder strap need

Pilot quickly extricates himself from chute harness. Lifeguards stand by for emergency

MARINE SCORES UNUSUAL FIRST

Fighter pilot bails out of crippled Corsair and downs first enemy plane from LST

IT'S A MOMENTOUS occasion when a fighter pilot downs his first enemy plane, but Marine Lt. J. didn't plan on chalking up his first score from a Landing Ship Tank. This unusual feat was accomplished after he was shot down in a dogfight and was returning to his base aboard an LST.

MY PLANE was hit five times. It felt like two 20 mm and three 50 calibers. One of the 20 mm exploded in my wing just aft of the landing gear and broke the gas line from the wing tank and set the wing on fire.

Realizing that I had to get out quickly, I rolled the tab to get a little more altitude and got rid of the cockpit cover by the emergency release. I was at 1,500 feet when I released my safety belt and rolled over the ship. I placed my left hand on the rip cord ring as I started out of the cockpit, but as I let go of the controls, the nose dropped. *Mistake 1.*—I had not rolled the tab forward and I was slammed back into the cockpit when the nose dropped. My left hand jerked the rip cord ring loose from the risers holder. *Mistake 2.* My hand shouldn't have been anywhere near the ring. I was afraid I had opened the chute, so I grabbed the stick and slapped it forward, catapulting me into the air.

I reached across with my right hand, jerked the dangling ring and the chute opened at once. I was traveling about 180-200 knots and about 800 feet when I bailed out. I slipped back into the risers and when a couple of hundred feet from the water, unbuckled the straps. I had no sooner done this when my feet hit the water.

I dumped the chute and swam clear of the canopy. I pulled the CO_2 rings in my Mae West but it immediately deflated. My Mae West had been punctured from the AA although I didn't notice any in the cockpit. I tried to inflate my life raft, but had difficulty in finding the CO_2 bottle. When I did, I couldn't find the pin or turn the handle. *Mistake 3.*—I had never inflated the raft before.

The raft, my clothing, and gear pulled me under water and I had to struggle to get to the surface. I was so exhausted by this time that I gave up trying to inflate the raft and released the strap from my belt. I then kicked off my shoes, pants and shoulder holster treading water and floating all the while. I had been swimming towards shore about a minute or two when I spotted a Higgins boat headed in my direction. I shouted, waved. They came by and picked me up. If I hadn't at one time played a lot of water polo and been used to treading water for long periods, I would never have been able to stay afloat until the boat reached me.

They gave me a blanket to keep warm, and I noticed I had a deep abrasion on my right arm. I dressed it with a sulfanilamide pack. When I reached shore, a Marine gunner gave me a pair of shoes and a Seabee gave me a shirt and a pair of pants. After a hot cup of coffee, I was taken to the hospital and treated for shock.

I spent three days and nights in the vicinity waiting to be evacuated. During this time, the area was under constant bombing attacks by the enemy, the majority being at night. The night bombings were really nuisance attacks. The fourth morning several LST's beached there, and I was told I might be permitted to leave on one of them.

I REPORTED to the captain, and learned they were short on experienced gunners so I offered my services. They assigned me to a 50-caliber Browning on the starboard side amidship, with a seaman as an assistant. At 1515, we were attacked by 8 Aichi-99s (*Vals*). They were first observed abeam about 2,000 yards, altitude of 2,000 ft., and diving in a scattered formation at the LST. The 40 and 20 mms opened up.

I held my fire until they were within 400 yards, and then I cut loose. My tracers were striking in the engine of the first Jap plane, and he started burning. About the same time, a 20 mm shell clipped his wing. I then swung my gun to the left and raked a second dive bomber. He also smoked. As he passed, I swung on another one—just as he dropped his bombs.

The concussion of the bombs blew my helmet off. I was struck on the head by something and knocked unconscious. When I came to, I learned no serious damage had been done to the ship. The bombs had landed on either side in shallow water, spraying her from stern to bow with coral. I also learned that four of the eight bombers attempting to skip bomb us had been shot down, one of them by me. It was a fine way for a Marine fighter pilot to get his first crack at an enemy plane!

DITCHING MUST BE PRACTISED

INITIAL REPORTS *on air/sea rescue operations indicated the need for education as to the proper procedures and use of emergency equipment. It has been emphasized that a ditching may be the result of unfamiliarity with the power plant or other operational features of the plane involved.*

MATERIAL DESKS of the Navy Department spend long hours developing and distributing the best equipment obtainable to insure recovery of personnel faced with the contingency of a forced landing at sea. Aviation Equipment Officers have been trained and sent to the operating units. Their duties include both the upkeep of this equipment and instructing personnel in its use. To use them for anything else is to court disaster. Technical orders and other instructions are promulgated to enable everyone to reap the maximum benefit from the material provided. In spite of this, reports of ditching continue to be discouraging. It is hoped that the effect of this safety and air/sea rescue educational program will soon reach the level of every individual concerned.

SITUATION

The following case history illustrates a series of recurring mistakes anyone of which could have been critical. The unfortunate plane crew was one of a section of SBD's assigned to Air/Submarine Training Exercises. The aircraft was supposedly carrying a full load of fuel; however, the gauges to the right main tank were inoperative. After about two hours, the section was reformed and returned to base. From the meager information available, it is believed that fuel was consumed from the auxiliary tanks during this period, with a "full rich" mixture setting. On returning to base, the section was ordered to continue the exercise. In the meantime, the unfortunate pilot had shifted to "right main," after having been on "left main" for a short time enroute to base. On receiving orders to continue the exercise, the mixture was shifted to "auto lean." After a few minutes, while at 500 ft., the engine cut. When this happened, the pilot shifted to "left main, full rich, booster pump on, positive low pitch" and nosed over. The engine started again but cut shortly thereafter. In the excitement, the SBD pilot failed to jettison his depth charge.

DITCHING

The landing was normal. As usual the sea was much rougher than it looked from flight altitude. Neither the pilot nor the gunner made any attempt to release the two-man life raft aboard the plane. The pilot disembarked on the port wing and inflated his life jacket preparatory to resorting to his Pararaft which would not inflate. The gunner received a small cut across his nose sustained from the cockpit enclosure on landing. It was not stated whether or not he used the safety harness or if it was defective. While disembarking, the gunner slipped and fell into the water. The buoyancy of the parachute caused the gunner to assume a face-down, tail-high position in the water. While in this awkward position, he shipped a great deal of salt water. His life jacket would not inflate because he had looped the lanyards over the bottle cylinder to prevent *accidental* release. He could not inflate his jacket orally because of his position, his exhausted condition, and the salt water in his system. The raft container and parachute had become waterlogged by this time, and he started to sink. The pilot had abandoned his futile attempt to inflate his raft by this time, and started to the assistance of his gunner.

The exhibition which ensued between these two excited survivors would have given a pre-flight life-saving instructor apoplexy, but after a struggle in which both took additional salt water aboard, they evolved a system whereby the pilot's life jacket provided buoyancy for both. The gunner put one hand on the pilot's shoulder and assisted by paddling with his free hand and kicking with his feet.

▸Twenty-two minutes after the landing, both were rescued by a crash boat, providing a happy ending to a series of sad mistakes and very costly errors.

ACTION

The action of the Accident Board is quoted below:

1. The danger of passing life jacket lanyards over the CO_2 bottle containers to prevent accidental inflation has been brought to the attention of all pilots and gunners.

2. The importance of attempting to remove the two-man raft from the plane before resorting to the seat pack rafts has been brought to the attention of all pilots and gunners.

Recommendations:

1. It is recommended that the danger of passing life jacket lanyards over the CO_2 bottle containers be brought to the attention of all flying personnel.

2. The Board does not recommend further investigation and action by the Bureau of Aeronautics and the contractor affecting redesign and procurement.

COMMENT

It is unfortunate that so many aircrewmen are oblivious to the need for accepted instructions and procedures until *after* such an incident transpires. Specific comments are provided below for those who want to avoid such fiascos as outlined above:

a. Due to the loss of the aircraft, lack of information on the Trouble Report, and the promiscuous shifting of fuel tanks, it is impossible to determine whether a power plant failure occurred or the fuel selector ended up on an empty tank while it was spinning around during the flight. It is obvious, however, that the pilot was either unfamiliar or neglected to comply with Flight Safety Bulletin 7-44.

b. The need for a ditching bill is is again re-emphasized. Only by periodic drills along a standard pattern can one hope to carry out an emergency with precision. Failure to release the two-man raft is typical of deficiency.

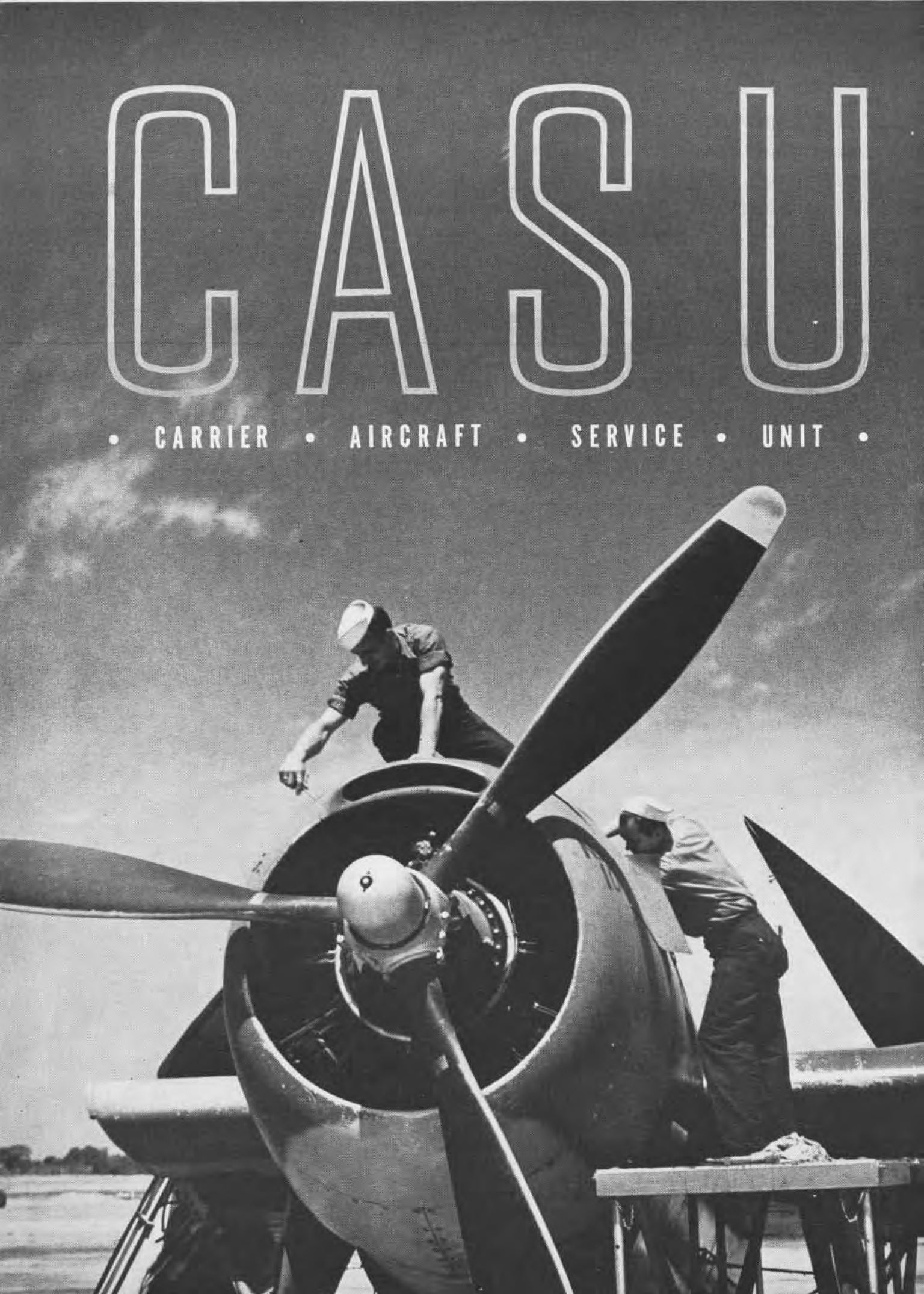
c. Emergency equipment will function if kept up properly and personnel are familiar with its operation; any condition inferior to this is unwarranted gambling with human life. Technical Order 44-44 is a specific example of efforts designed to prevent accidental inflation of the life jacket and at the same time insure immediate inflation when needed. Judging from the action of the Trouble Board, no one in the organization had ever seen this order.

d. The expeditious rescue is a tribute to the efficiency of the local air/sea rescue organization. The overall efficiency of this organization will increase in proportion to the cooperation received from flight personnel.

e. Failure to jettison the depth bomb in the "unarmed" condition could have very easily converted this accident to the "Missing-Undetermined" status.

CASU

• CARRIER • AIRCRAFT • SERVICE • UNIT •



IT MAINTAINS CARRIER-TYPE AIRCRAFT ON LAND

THE SCENE is an island airstrip in the Central Pacific. Several planes are away on strikes, some are assigned to emergency standby: others are loaded with depth charges awaiting search assignments and final grooming before release to the pilots.

Suddenly a dispatch is received. "All available planes strike—immediately!" Mechs, radiomen swarm over the planes, removing depth bombs and testing each shackle. Other bombs quickly are fused, finned and loaded. Within a short time the planes are in the air. The strike is a success. Returning pilots state that a 15-minute delay could have affected seriously the outcome.

The mechanics, radiomen and other technicians whose fast work helped make the strike a success were attached to a Carrier Aircraft Service Unit based on the island. Flight crews have come to regard these CASU men as their partners in operations. They share with the fliers the rough life, bombings and casualties.

Duties and activities of CASU's are not so well understood throughout the Fleet as some older programs because they are a war development, not perfected during peacetime days. Before Pearl Harbor, non-flying personnel accompanied their carrier air groups ashore from carriers. Such personnel now must remain ship-based to maintain the carrier in full readiness for operations, while the air group itself must remain free to base either ashore or aboard ship.

This requires that a separate unit be furnished to service the squadrons and support their shore-based operations. The situation is further complicated by the fact that, during peacetime, shore-based air group operations were conducted from well-equipped naval air stations, whereas wartime operations may be carried out from advanced or dispersed bases.

The CASU therefore must be a mobile unit ready to proceed on short notice to any point with sufficient equipment to perform satisfactory service without the close availability of complete service in A&R shops.

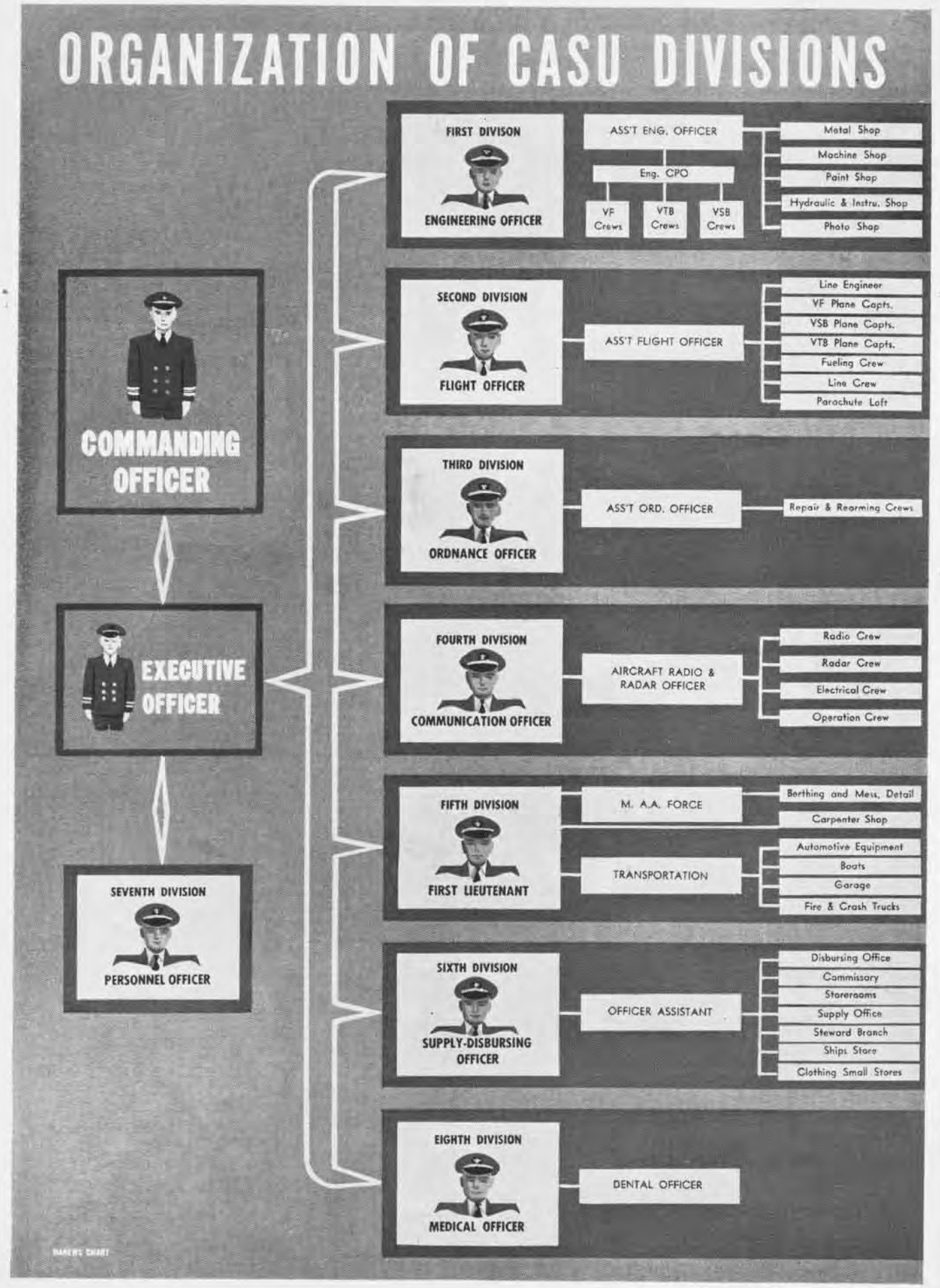
THERE are scores of CASU's today operating on islands in the Pacific and a few large units operating in continental United States. Included in the latter are those at Quonset Point, Norfolk, San Diego, Alameda and Seattle. Because they are under authority of Fleet Air Commands, continental CASU's train personnel for Carrier Aircraft Service Divisions (CASD's), which will maintain planes aboard ship. CASU's are land-based.

A CASU has many jobs. Its mechanics repair and do minor overhaul on the squadron's planes. Its men rearm the planes, help them taxi around parking strips and fix their radios. CASU's are responsible for berthing, messing and entertaining pilots and ground personnel of squadrons, if such facilities are not already available through some naval air station. They furnish transportation, provide line shacks and ready rooms, slit trenches and bombproofs.

They are charged with providing facilities to maintain physical fitness and morale of air units based with them. This includes building athletic fields, reading rooms, providing movies. The approved CASU complement is 17 officers and 516 men, but they vary widely in size, according to their location in the war picture.

Rearming of SBD's on a palm-fringed Pacific airstrip is one of jobs performed by CASU at an advanced base. Acorn builds the runway

As soon as an island is captured from the Japs, CASU personnel come ashore to set up maintenance for squadrons when they arrive


ORGANIZATION OF CASU DIVISIONS
COMMANDING OFFICER
EXECUTIVE OFFICER
SEVENTH DIVISION
PERSONNEL OFFICER
FIRST DIVISON
ENGINEERING OFFICER
ASS'T ENG. OFFICER
Eng. CPO
VF Crews
VTB Crews
VSB Crews
Metal Shop
Machine Shop
Paint Shop
Hydraulic & Instru. Shop
Photo Shop
SECOND DIVISION
FLIGHT OFFICER
ASS'T FLIGHT OFFICER
Line Engineer
VF Plane Capts.
VSB Plane Capts.
VTB Plane Capts.
Fueling Crew
Line Crew
Parachute Loft
THIRD DIVISION
ORDNANCE OFFICER
ASS'T ORD. OFFICER
Repair & Rearming Crews
FOURTH DIVISION
COMMUNICATION OFFICER
AIRCRAFT RADIO & RADAR OFFICER
Radio Crew
Radar Crew
Electrical Crew
Operation Crew
FIFTH DIVISION
FIRST LIEUTENANT
M. A.A. FORCE
Berthing and Mess, Detail
Carpenter Shop
TRANSPORTATION
Automotive Equipment
Boats
Garage
Fire & Crash Trucks
SIXTH DIVISION
SUPPLY-DISBURSING OFFICER
OFFICER ASSISTANT
Disbursing Office
Commissary
Storerooms
Supply Office
Steward Branch
Ships Store
Clothing Small Stores
EIGHTH DIVISION
MEDICAL OFFICER
DENTAL OFFICER

Taxiing and parking of planes on an airfield is job of the CASU. Here a plane captain helps a *Corsair* pilot fold his wings prior to bringing the plane to the parking line. CASU based on island works hand-in-hand with Acorn, which includes a group of Seabees

CASU PROVIDES MEN, WHILE ACORN HAS EQUIPMENT ON ISLAND BASES

WHEN A CASU is based on an island, it becomes part of an advanced air base assembly and works hand-in-hand with an Acorn. In simplest terms, the CASU personnel maintain the planes. The Acorn furnishes the materials and equipment. It looks after the housekeeping and conveniences for squadrons. The latter does most of the building, since it has Seabees numbered among the standard complement of 67 officers and 1,590 men. However, like CASU's, they too vary widely in size.

An Acorn is an airfield assembly designed for rapid repair, installation and operation of a landplane and seaplane air base, or in conjunction with amphibious operations, for repair and operation of a captured enemy airfield. In such island setups, CASU's usually confine themselves to servicing, rearming and minor repairing of squadron planes based on that island. When the squadrons leave, the CASU remains, awaiting the next visiting "firemen." Overhauls and major repairs are made by aircraft repair and overhaul units in rear areas.

CASU's are trained to work on carrier-type planes—F6F, TBF, SBD, SB2C principally. Naval aviation has another type of line maintenance group called a PATSU which handles patrol aircraft servicing. Their mechs and technicians are trained to work on PBY, PB4Y, PBM, PBJ, PV and other large planes. Its men do the same work as a CASU but on the plane-types in use by their own squadrons.

A CASU is organized into eight divisions. ENGINEERING division includes personnel to operate everything from the machine shop to the photo and propeller shops FLIGHT division personnel comprise line engineering crews, parachute loft, fueling crews, and tractor men. ORDNANCE division rearms aircraft guns, loads bombs and torpedoes, and keeps the plane's armament operating. COMMUNICATIONS division installs, checks and repairs all radio gear and handles secret and confidential mail.

Under the FIRST LIEUTENANT come berthing and messing, maintenance of buildings and grounds, carpenter shop, fire and air raid security, damage control, and maintenance of a garage for care of CASU vehicles.

Sixth division, SUPPLY AND DISBURSING, is responsible for procurement, custody, issuance and accounting for all materials required for operation of the CASU. It inventories incoming and outgoing aircraft, maintains storerooms for handling material needs of squadrons and the CASU, maintains office records and handles disbursing. The storeroom has sufficient stock to furnish all upkeep requirements for repairing any type of aircraft under the CASU's charge. PERSONNEL and MEDICAL divisions comprise the remainder of the unit's extensive plan of organization.

CASU's BASED within continental limits of the country may have additional duties not required of those on island bases. Besides training men to make up crews for maintaining carrier-type planes, to be organized later and sent out as CASD's to work on carriers, they also serve as mustering points for squadrons which will man new carriers.

CASU'S HAVE MANY TASKS

THE No. 1 job of the Carrier Aircraft Service Unit is to maintain and repair planes. It may be on some little atoll in the Central Pacific, a comparatively luxurious rear base like Espiritu Santo, or at an air station in continental United States. Most of the CASU's however, are based on islands and their job is to keep the squadron's planes flying. The pictures on these two pages show a few of the jobs a CASU does, on the mainland or at some remote station.

CASU's on advanced Pacific islands run into the same kind of rugged living conditions as frontline troops. Long hours of night work repairing carrier-type planes, sleepless nights filled with bombings, cold food, disease, casualties, foxholes—all of these are a daily chapter in the kind of warfare they are running into. Many units landed right behind the Marines and had to build their bases from scratch before they could start maintaining planes. Their problems are much different from those confronting CASU's operating on the continent. Squadrons had a habit of dropping in before the official reception committee was all set, supplies were delayed and replacement parts lost, but the CASU's kept the planes flying, helping to push the Jap back toward Tokyo.

Training of fighting personnel goes on even at advanced bases. Here a class of Marine gunners views a recognition film so that they can recognize friendly planes when they appear. Entertainment of squadron personnel also falls upon CASU on an island

Flight division of a CASU is charged with fire prevention and fire-fighting, along with fueling and maintaining airplanes. Here two "Smokey Joes" stand by with extinguishers in case SNB in crack-up should catch fire. Fueling crew handles this duty

Refueling of planes is another task assigned the CASU's flight division, which also takes care of line engineering, parachutes and tractor crews. Fueling of aircraft has to be done promptly and correctly to keep plane ready for action in advanced areas

Messing, berthing and service of personnel of air units based on an island falls upon the CASU. Here pilots of a fighter squadron on Bougainville eat chow, dished up for them, after a big day in which they shot down 16 Japanese planes in spectacular dogfight

Operations room at CASU headquarters at Quonset Point shows plenty of activity. Service units provide the pilots with line shacks, ready rooms, slit trenches or bombproofs, whenever the need arises. At continental stations their task has new angles

Maintenance of aircraft in a flying condition is the No. 1 duty of a CASU anywhere, whether in a well-equipped machine shop as shown here or at some airfield captured from the Japs. Life in latter places sometimes involves bomb-dodging, fighting off Japs

Health of a squadron's personnel is important, so CASU's provide medical and dental care and look after sanitation problems wherever they may be based. Pictured here is a dentist at Quonset as he works on a patient, while another watches his technique

Supply of aircraft parts so planes can be repaired and put back in the air to fight, requires an efficient set-up in a CASU. All parts from wheels to propellers or tires must be carried in the CASU's stock room. Parts for patrol aircraft are handled by PATSU

Rearming a TBF's wing guns is done by a CASU ordnance crew when the plane finishes a mission or returns to its station after a gunnery run. Some service units operate their own training schools to keep men up on newest developments in engines or ordnance

Even the commonplace ready room is an activity looked after by the CASU if it is on an advanced base or a station where such is not already provided. This photo shows CASU ready room at NAS Quonset Point, where pilots await transport or other assignment

CASU TRAINS ITS MEN ON SPECIAL TYPES OF AIRCRAFT IN SQUADRONS

CARRIER Aircraft Service Units draw their enlisted personnel from all branches of naval aviation. Most come to them as raw boots and have to be trained from the ground up. They are assigned to simpler tasks around the apron until they can learn enough about a phase of aviation to strike for a rate.

CASU's run in various sizes, depending on whether they are formed to maintain 45 planes, 90 planes, 180 planes, 270, or the big 360-plane outfits. They have a standard complement of officers ranging from 16 to 89 and enlisted men from 185 to about 1,500.

The units have all types of enlisted ratings assigned to them, although machinist's mates, ordnancemen and radiomen predominate. Out of the 185-man aviation enlisted ratings with a 45-plane CASU, for instance, 78 are aviation machinist's mates. Such a CASU also has 79 in the seaman branch.

Some of the men attached to a unit, such as the big one at NAS Quonset Point, are graduates of Class A technical training schools. Others come to it more or less untrained and as a result the CASU there has set up a ground school for training them in the kind of engines, propellers, hydraulic systems or electrical systems to be found in carrier aircraft.

Men who have already had technical training get refresher courses in their specialties while they are attached to the CASU. A flow of men travels down a regular conveyor-belt of stations where they learn intricacies of the latest-type engines in a 30-day course. They receive intensive training in top-overhaul of aircraft engines and accessories. Four-man crews report to the ground school laboratory every other day to start the course, graduating a month later, ready for duty for the CASU or with some CASD being formed to operate on a new aircraft carrier about to go out to sea.

PLANE CAPTAINS from CASU and the CASD's are provided with 12-day courses to give them the essential basis for doing their jobs with a minimum loss of time. The CASU at Quonset Point found it necessary to train its own men, because they either were received without any training, or came from ships where they got general training that did not deal too specifically with plane types peculiar to carriers.

The CASU provides specialized training in the particular engines, carburetors and other equipment found on fighters, torpedo and dive bombers. Radio and gunnery practice also are provided to keep the men abreast of latest developments and keep their shooting eyes keen. Officers from squadrons and CASU's of CASD's also get special instruction in the training school.

All third-class petty officers and all seamen reporting at Quonset Point CASU are sent directly to the school. They receive six days of training to familiarize themselves with what CASU's do and how they are organized. It also gives officers a chance to get a line on their abilities.

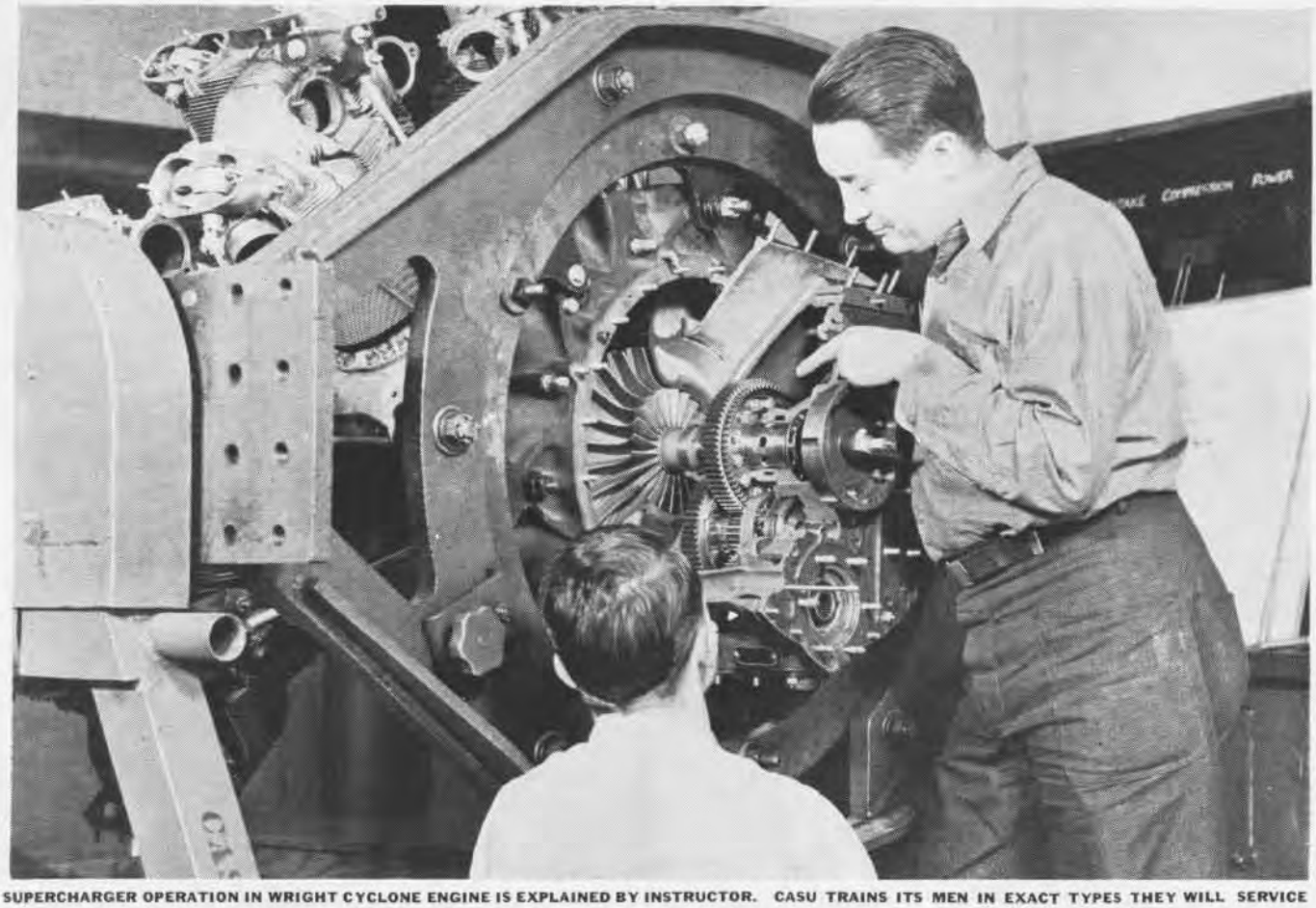
The school also is responsible for maintaining and supervising a reservoir of aerial gunners and qualified combat aircrewmen for assignment to squadrons on request. Gunnery facilities of the air station are utilized to train them.

Assisting in training of enlisted men for CASU duty at Quonset, is the Advance Base Aviation Training Unit, called ABATU. Rather than operate regular training classes, the ABATU puts its men directly into action in the A&R shop at Quonset, letting them learn intricacies of aircraft engines and parts first hand. The parent ABATU is located at Norfolk. These units are continental-based. Their graduates wind up in CASU's, CASD's, Acorns, Hedrons, NATS, aviation repair and overhaul units, and service wherever Fleet Air Commands require maintenance to be done on Navy aircraft.

BASIC FACTORS OF ELECTRICAL SYSTEMS OF HELLCAT AND AVENGER ARE TAUGHT CASU PERSONNEL AT QUONSET POINT GROUND SCHOOL LABORATORY

BECAUSE OPERATIONS of the CASU at Quonset are too large to be carried out on one station, CASU detachments have been spread over four New England states. They operate at naval auxiliary air fields from Rockland, Me., to Groton, Conn., where squadrons are shifted to make more air space available for training while awaiting call for active duty. Other detachments are at Hyannis, Ayer, Martha's Vineyard, Squantum and New Bedford, Mass., and Sanford, Me.

Since squadrons based away from the main station require complete servicing of planes, each detachment is a complete service organization in itself. The parent CASU provides the complement and equipment for the above detachments. A number of pilots are attached to CASU Quonset. Some get special training prior to joining their squadrons.



SUPERCHARGER OPERATION IN WRIGHT CYCLONE ENGINE IS EXPLAINED BY INSTRUCTOR. CASU TRAINS ITS MEN IN EXACT TYPES THEY WILL SERVICE

HYDROMATIC PROPELLER IS MOUNTED ON ENGINE BY STUDENTS AT GROUND SCHOOL LAB, QUONSET. ONE-MONTH COURSE TRAINS FOR ACTIVE DUTY

CASU GROUND CREWS KEE

THESE SCENES, familar around any CASU, were sketched by a Navy artist at a New England air station, showing how the men occupy their time, both on and off duty. Carrier Aircraft Service Units are a versatile group, doing a wide variety of jobs, most important of which is the maintenance of carrier-type aircraft while they are land-based. Located principally at advanced bases, the CASU does nearly everything short of major overhauls, and takes pride in keeping the squadron planes in peak condition, ready for flight. Only then can men relax from their work and other duties to "shoot the breeze" or catch some extra "sack time."

SKILLED MECHS, WORKING AGAINST TIME, REPLACE THE ENGINE IN A FIGHTER PLANE

HERE, AS ELSEWHERE, MEN STUDY FOR HIGHER PAY GRADES AND A BETTER JOB IN CIVILIAN LIFE AFTER WAR IS OVER

WHEN THE PLANES ARE 100 PERCENT AVAILABLE, MEN CAN LOUNGE IN THE SUN, TALK OF HOME AND THEIR GIRL FRIENDS

P NAVAL AIRCRAFT ALOFT

MEN PULL PROP THROUGH BEFORE START-
ING ENGINE OF ONE OF THE POWERFUL
FIGHTER PLANES PARKED ON THE LINE

KEEPING THINGS SHIPSHAPE, INCLUDING
ONE'S CLOTHES, IS AN OLD NAVY CUSTOM
AND OCCUPIES MEN WHEN NOT ON DUTY

MINOR CRASHES MAY BE REPAIRED BY THE
CASU. THOSE REQUIRING MAJOR OVERHAUL
OFTEN ARE STRIPPED OF UNDAMAGED PARTS

SURVIVAL QUIZ

Correct answers on page 40

1. Fish may be located more quickly and more easily in—

- ☐ *a*–large deep lakes
- ☐ *b*–broad rivers
- ☐ *c*–small shallow streams
- ☐ *d*–large deep streams

2. When following a long compass bearing to a camp on shore or river, you should—

- ☐ *a*–head directly for camp
- ☐ *b*–aim to strike some distance to either side of camp
- ☐ *c*–change compass bearings as you travel
- ☐ *d*–count your paces

3. Of 2,400 varieties of snakes, the following number are poisonous—

- ☐ *a*–none
- ☐ *b*–600
- ☐ *c*–200
- ☐ *d*–1,400

4. To boil in bamboo container—

- ☐ *a*–use dry bamboo
- ☐ *b*–puncture all nodes
- ☐ *c*–use freshly cut joint
- ☐ *d*–place container near the fire, not in it

5. The greatest danger in tropical jungles is—

- ☐ *a*–wild animals
- ☐ *b*–natives
- ☐ *c*–poisonous snakes
- ☐ *d*–mosquitoes

6. A good snare should not be—

- ☐ *a*–set on a well-worn trail
- ☐ *b*–set to strangle animal
- ☐ *c*–set for any type of animal
- ☐ *d*–large enough for animal's head

7. Drinking impure water may lead to—

- ☐ *a*–malaria, yellow fever
- ☐ *b*–dysentery, typhoid, blood flukes
- ☐ *c*–typhus, trench fever
- ☐ *d*–verruga, kala-azar fever

8. The greatest danger to experienced Arctic travelers is—

- ☐ *a*–not getting enough food
- ☐ *b*–scurvy
- ☐ *c*–carbon-monoxide poisoning
- ☐ *d*–freezing to death

Fighting men must be tough physically to perform their jobs under stress of combat

RECENTLY *a doctor who had just returned from the Pacific wrote a paper telling of the absolute necessity for top physical condition if those fighting the war expect to survive. Following is part of his report.*

MY OWN personal experience preceding and during several months of duty in the South Pacific has deeply impressed on me the absolute need for tough, hard physical constitution.

In civilian life I had been a practicing doctor leading a complacent sort of life of the average physician, working hard mentally but with very little physical exertion. The result was flabby muscles and a rather large midriff. One and one-half years of Navy shore stations did little to harden me up.

Then 14 months ago I received orders to report to a construction battalion for duty overseas. On reporting to the battalion I was informed that we would strip ourselves of corps and rank insignia, report to the armory, pick up a rifle and report to a designated place. The first day we marched four miles, the next day six, and so on. (To me it seemed *ad infinitum*.) When we could march 12 and 14 miles without breaking we were put over the commando run. It was a great day when I could climb over the high wall obstacle without someone's shoulder under my fanny.

I crabbed and griped that I, a doctor, should have to go through this conditioning when my job was to take care of sick people, but after my experiences overseas I wished to God they had been twice as tough in conditioning me.

Grueling Combat Life Drains Stamina

When sailing to our destination with men sleeping in three-tier berths, disease would have been rampant among them if they had not been in good physical condition. Even before the battle began, they found further need for being in good shape when they spent long hours in unloading equipment, ammunition, bombs and gasoline.

In battle the men were working 16 and 18 hours a day, and only men who had been well conditioned and were in good physical shape could stand up under such grueling conditions as existed at the time of the landing and the following days. A few men from time to time broke under the strain and had to be evacuated. It always was those who were in poorer physical shape.

TROPIC DISEASES were rampant and those in poor physical condition picked them up more readily, necessitating evacuation, in some cases, out of the area. It finally came my turn to be evacuated and then it was that I wished I had been a tougher, better physically conditioned officer than I was. If I had my training period to live over again, I would spend all available time in strengthening and conditioning myself.

To you officers and men who could better serve your country at home and on foreign soil, prepare yourselves to be physically able to do so. Regardless of hardships involved, the end justifies the means.

SHORE STATIONS

▸NAS LAKEHURST—The WAVES played a rather confusing softball game a few weeks ago. One player had been on first base as a runner, and when her side was retired, she picked up her glove and resumed playing at first base. The first batter lined out a hit, and the WAVE, forgetting for the moment whether she was supposed to be at bat or in the field, tore out for second. She rounded third base and was enroute home before realizing her mistake.

▸MCAS MOJAVE—Final tabulation of the results on the recent War Bond campaign shows that this station topped all other Marine west coast air stations and even surpassed the combined totals of them all.

▸NAS CAPE MAY—The laundry situation grows more desperate each succeeding day. Among suggestions for improving conditions appears the idea that formations could be eliminated entirely or else swimming suits become the uniform of the day. One lost soul even intimated he was considering doing his own laundry!

▸NAS JACKSONVILLE—Before a recent baseball game between the Navy and Coast Guard in St. Augustine, the coach of the Coast Guard team called his boys together for a little pep talk. In the late Knute Rockne style, he produced an unsigned post card which contained the very brief message, "The Navy thinks you're lousy." The final score was 9 to 3 in favor of the Coast Guard.

▸MCAD MIRAMAR—A Marine dive bomber pilot, recently returned from the South Pacific, inaugurated a new fighting tactic during a period of extreme stress.

He had gone into a dive and dropped his bomb on a Jap vessel. While still traveling at a terrific rate, he was indeed startled to see a Jap *Zero* out of the corner of his eye. In fact, the enemy was so close he could see the slanted eyes behind the goggles, but the Leatherneck's location was such that it was impossible to swing his guns into action. There was but one "weapon" to use, and he used it.

The Marine pilot thumbed his nose.

▸NATC CORPUS CHRISTI—Fifteen war information rooms, packed with confidential, restricted and technical information about the war, are now operating throughout NATC for the benefit of officers and cadets—a part of the extensive ground training program. These information centers serve to provide background for air combat intelligence work in the war zones. These libraries were set up to facilitate wider distribution of classified material. They are carefully supervised—for the most part by WAVE officers.

▸NAS BRUNSWICK—This station was built on one of the most famous blueberry grounds in the state of Maine. In several areas, the berry patches were untouched by construction, with the result that the succulent berry wholly ignores the fact that its natural environment is no longer a cut-over plain but a big, bustling air station and yields its blue harvest as abundantly as ever. To prevent the berry crop from going to waste this year, July 31 was designated as berry-picking day. Wives of officers and enlisted men were invited to spend the day berrying for current menus and for canning purposes.

▸MCAS EL CENTRO—One private in the station gunnery school has been in the Marine Corps for thirteen years. His thirteen years, however, are an accumulation of numerous short intervals in the service.

▸NAS OTTUMWA—Among the hundreds of cadets schooled in flying at Ottumwa, only one has been a Navy officer. He was commissioned an ensign in December, 1942, and was promoted by an A1Nav to lieutenant, junior grade. He voluntarily resigned his commission, however, as a deck officer because he wanted to fly and felt that he could contribute more to the war's speedy conclusion as a naval aviator. He will be commissioned an ensign again in approximately six months.

▸NPFS IOWA CITY—Naval air cadets, completing a ten-week course, have an ingenious way of figuring time before shoving off on leave. At the end of five weeks, they point out that the week after next they can say that the week after next they have only two weeks to go.

▸NAS PASCO—"Red Dog," the devoted collie mascot of a recent primary training class of cadets, journeyed from Pasco, Washington, to Corpus Christi, Texas, to continue his aviation training and also be near his many masters. There he remained in a suitcase until the station authorities were won over. Red Dog is apparently convinced that cadets in canine form should neither be seen nor heard, for he has spent his days at Corpus rigidly observing all naval regulations and disporting himself in the best accepted manner of a potential officer and gentleman.

▸NAAS GREEN COVE SPRINGS—Panic spread through the WAVE lines at a recent Aviation Training Department personnel inspection, when the chief in charge continued to shout, "Pick up your dress." It wasn't until the inspecting party arrived that some of the girls realized that the chief wanted the line straightened out.

▸NAS DALLAS—Snow White and the Seven Dwarfs found a counterpart at NAS Dallas recently, when a WAVE aerographer started teaching seven sailors the secrets of the ancient science of meteorology. Aerology personnel are being asked every day who the little WAVE aerographer is that is always being followed by the same seven big men.

▸NAS GROSSE ILE—The latest scuttlebutt is that only cadets having five enemy planes to their credit are eligible to receive their wings.

▸NAAS FRANKLIN—The owner of the local theater in the town of Franklin is making a movie to be called "Activities of Franklin," in which will appear several shots of the officers and men of this station. This picture will be shown locally for several days and then stored away as a permanent part of the history of Franklin, Va., and its contribution to the war.

▸NAS PENSACOLA—"Navy Juniors," numbering 13,356, have been cared for during the past fiscal year by the station nursery. Children of officers and enlisted men were among those utilizing the facilities of the nursery. During the last three months of the fiscal year, 1,781 were under one year of age, 2,101 were between the ages of one and four years, and 349 were over four years of age.

▸NAS GROSSE ILE—A cadet requested permission to go to sick bay following a solo during which he said the gas cap came off and hit him on the head, causing an acute headache. The cadet was logged out by the SDO who said that anyone capable of thinking up an excuse like that certainly deserved a good, long rest.

▸NAS Pensacola—Rallying after spotting the Eglin Field Wacs to an 11-run lead in the first inning, the station Waves softball team in a recent game came from behind to tie the score in the last inning—only to lose the tilt in the extra inning by a score of 14 to 15. Eglin knocked two Wave pitchers out of the box in the wild first inning.

▸MCAD Miramar—A Marine major, just back from overseas duty, has served under three flags during the current war—French, British, and American.

When the Nazis invaded France in 1939, he joined a volunteer ambulance corps and was attached to the 8th French Army. While awaiting passage home following six months of service, he was captured by the Germans at a port of embarkation and was imprisoned for six weeks.

After his release was obtained by the State Department, he enlisted in the Royal Canadian Air Force as a tail gunner and bombardier. As a flight sergeant, he completed numerous round-trip hops from Canada to England prior to receiving a Marine Corps commission in 1942.

▸NAS Norfolk—The nas Waves and Camp Patrick Henry Wacs kept the traditional Army vs. Navy spirit alive recently with a Wave anniversary softball game. Although the Wacs were not an easy foe, the score resulted in a naval victory, thus turning the tide of the season.

▸NATC Corpus Christi—One plus one equals two in Texas, but when it comes to Texas blood, some Texans believe that one pint is equivalent to one gallon from any other place. Several months ago several Texas boys were installed as official blood donors. Special labels were put on the bottles reading, "This is Texas blood. Use small quantities only. Large quantities cannot be absorbed by men from any other state."

▸NAS Norman—The gunnery department has improvised a method of eliminating the raking of sand on the indoor range in order to recover spent cartridge casings. Four sections of flooring have been joined to make a removable deck. Two of these sections are placed in line with each of the target frames. The spent casings may be swept from this deck in a few minutes. This also enables the gunnery department to use a 25-foot target by moving the pistol stands to the end of the deck.

▸NPFS Athens—A leatherneck went into a field hospital complaining that he had trouble sleeping nights. The Navy doctor advised him to eat something before going to bed. The patient looked startled: "But, doctor, two months ago you told me never to eat anything before going to bed."

The doctor blinked once or twice. "My boy, that was eight weeks ago. Science has made enormous strides since then."

▸NAS Brunswick—A Wave striker in the photo lab was sure there were two sides to a piece of film, but she wasn't sure which of the two was the emulsion side. "Which side," she inquired, "is the emotional side?"

TOKYO TALKS

—To Japan

With regard to the recent raid on Manchukuo the Japanese radio charged the "San Francisco radio" with announcing the attack while the raid was in progress and before the planes had returned to their base. "Judging from this fact," said the Tokyo broadcast, "it is clear that in this raid, just like the recent raid on north Kyushu, the American fliers were out for propaganda results rather than war results."

—To Japan

War demands have caused the Japanese to limit to one "war model" certain furniture designs, and to raise prices on such household articles by approximately 40 percent, the Tokyo radio says. Chests of drawers, mirror stands and "ladies' work boxes" will be made in one "war model" design retaining only the features "deemed absolutely necessary for war time family life." Small chests and "chests for keeping western-style clothes" will not be manufactured, being classed as "unpatriotic articles."

To Occupied Areas

A Domei dispatch to occupied areas, noting the resignation of the Tojo cabinet, said, "The reason, to put it straightforwardly, is that the individuality of the Tojo cabinet was unable to keep up with the intensity of the burning war spirit of the people."

—To Asia

As part of a Japanese drive to increase domestic food production, Emperor Hirohito recently planted the "first rice seedling" with "his own hands" in a rice planting ceremony on the Imperial palace grounds. The Emperor "retired" after the ceremony, "greatly pleased."

—To Japan

In a recent talk, Tadao Obata, director general of the Business Affairs Bureau of the Imperial Rule Assistance Association, Japan's totalitarian political party, and president of the Imperial Japanese Industrial Patriotic Service Association, said: "Enemy, come if you wish. We have steel-tight determination and preparation. . . . The Americans do not realize that they have been defeated but continue to attack persistently. . . . However, even if houses are burned and machinery destroyed, the Japanese are unperturbed. If they don't have houses they can camp outside. The machinery hit is immediately restored."

To The United States

With the fall of General Hideki Tojo's cabinet came the following statements released by the Japanese Domei agency. "Either intentionally or out of ignorance, Britain and the United States are determined to fix the title *dictator* on Tojo. But whatever they say or charge, actual conditions in Japan prove without any doubt that Japan is entirely devoid of dictatorship."

—To Japan

Shizuko Kasahara and Takeko Uchida, who "experienced" a recent American air and surface craft raid on the Volcano and Bonin Islands, returned to the Japanese mainland with a warning that greater attention must be given to fire protection. "Upon returning to the homeland we looked upon the compact conditions of the homes and buildings and thought that it would be fine if everyone considered fire protection to a greater extent."

—To Asia

In a recent broadcast Tokyo expressed a sharply skeptical attitude toward the efforts of Nazi officialdom to explain reverses in Normandy as part of a basic German strategy of "luring the enemy deeper into French territory for a knockout blow." Tokyo asks: "Is the giving to the enemy of such a strategic stronghold—the outstanding fortified naval base in the English channel—included in this luring strategy? . . . With the fall of Cherbourg, the armada of warships, transports and landing craft will be deployed to other theaters of war."

SHOW ME THE WAY TO GO HOME

Where Am I?

At approximately GCT 0930 May 1, 1943, the navigator of a NATS PBM-3c, DR position, Lat. 26° 50′ N, Long. 172° 15′ E, on cus 275°, PGS 176 k, flight altitude 1,400 ft., took these observations. I.C. (—) 5′.

Body	*Polaris*	*Jupiter*
GCT	09-26-10	09-32-46
hs	26° 18′	33° 03′

1. What is Polaris' Q correction?
2. What is the hc of Jupiter?
3. What is the Zn of Jupiter?
4. What is the GCT of 0930 fix?

Lat. .....

Long. .....

(Answers on page 40)

CAMERA 'TOURS'

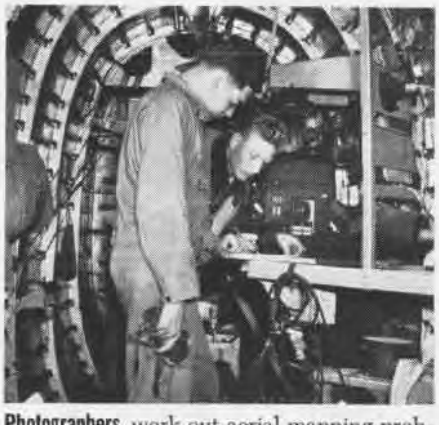
CAMERAMEN OF FLEET AIR WING PHOTO UNIT APPROACH PV WHICH WILL CARRY THEM ON THEIR MISSION PHOTOGRAPHING INSTALLATIONS OF ENEMY

Fleet Air Wing Photo Unit Travels Far to Map Enemy Operations

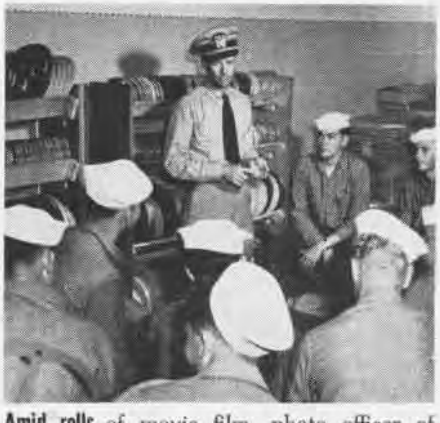
CAMERAMEN who joined the Navy to see and photograph the world get a full measure of both in the photographic unit serving Fleet Air Wing 15. In the past year and a half its photographers have operated over three continents, ranging from the Bay of Biscay to Salerno, Naples, Sicily, to Asia and the Azores.

When the wing was set up in 1942, it consisted of 10 photographers, five cameras and a two-room lab which it shared with the Army. At the end of its first quarter it has processed 1,325 negatives and 3,764 prints. Now it has 22 photographers, including two officers, an eight-room lab, and turned out 4,877 negatives and 17,112 prints for the first quarter of this year. Its cameramen use Graflex, Speed Graphic, Medalist, view, aerial mapping and oblique, automatic gun, K-25's, identification and motion picture cameras.

In addition to anti-submarine work and special out-of-town assignments, the work now includes identification shots, awards, celebrations, beach parties, visiting gold braid, broken parts, crashes, athletic events, funerals, aerial mapping, vectographs, aerial patrols and oblique and vertical pictures. The unit is one of the best equipped and most active in the far-flung U.S. armed forces. Its growth is typical of the rapid expansion of the Navy over the world.



Photographers work out aerial mapping problem before starting on reconnaissance job



Amid rolls of movie film, photo officer of fleet air wing tells of new job to be done

DID YOU KNOW?

History of Naval Aviation

Work on Project Implemented

At the beginning of the war, a unit was set up to compile the historical record of naval aviation. This record will be the story of the contribution of naval aviation to the winning of the war.

The Naval Aviation History Unit (Op-33-J-6) is comprised of qualified officers who work in cooperation with other historical officers, within the Navy Department and in the field, the latter being called upon to submit significant material in accordance with Aviation Circular Letter 74-44 of 25 July 1944.

As one phase of this history project, carriers, squadrons, and air groups now are reporting each month, on Naval Aviators' Monthly Achievement Report forms, the personal achievements in aerial warfare of pilots and aircrewmen, which can be compiled as part of the action record of combat squadrons.

Air Data Center Is Formed

Gather Intelligence on the Japs

A technical air intelligence center has been set up at NAS Anacostia "for the final evalution of technical air information on the Japanese air force and for dissemination through appropriate channels of the results." The center replaces the captured enemy aircraft equipment unit which was there.

Functions of the new activity will be:

1. Receive, evaluate and analyze all intelligence reports, dispatches, photographs, etc., relating to enemy air equipment.
2. Determine Japanese aircraft and engine performance data.
3. Prepare master drawings, silhouettes, sketches and models for use in recognition training, and in development of performance data.
4. Receive, overhaul and rebuild captured aircraft, engines and air equipment, and conduct tests.
5. Train personnel for technical air intelligence duties in the field.
6. Produce and issue timely and useful technical air intelligence summaries and reports for dissemination to the Allied military services and government agencies.

Ship Honors Marine Pilot

Named After Alfred Cunningham

One of the Navy's newest destroyers has been named after the late Lt. Col. Alfred A. Cunningham, father of Marine Corps aviation and Naval Aviator No. 5. The destroyer, a 2,200-tonner, was launched recently in New York, under sponsorship of Mrs. Cunningham.

Back in 1911, Cunningham began his

CUNNINGHAM HOLDS CONTROLS OF EARLY PLANE

aeronautical career by trying to get a rented aircraft dubbed "Noisy Nan" off the ground. The following year he went to the Navy's aviation camp at Annapolis and soloed after two hours and 40 minutes of instruction. He went to Pensacola in 1915 and thence to San Diego. The same year he became the first naval pilot to catapult from a warship under way. During World War I, he commanded the First Marine Aviation Force in France and later was in charge of the entire Marine aviation program.

DO NOT SEND NAVAL AVIATION NEWS HOME!

NAVAL AVIATION NEWS is published under a RESTRICTED classification and intended for distribution among uniformed Allied personnel only. Copies of the magazine therefore should not be sent home, to civilian friends or to any other unauthorized individuals.

Air Groups Return to U. S.

Score 300 Jap Planes, 89 Ships

Two air groups have returned from the Pacific area for rest and reassignment after destroying or damaging 300 Japanese aircraft and 89 ships between them during their tours of duty.

Air Group 30 piled up a score of 219 planes and 51 ships in five months, at a loss of only three pilots killed and five wounded. Air Group 23 spent eight months on a light aircraft carrier (CVL), flying protective patrol around task forces much of the time but seeing enough action to account for 81 Jap planes and 38 ships.

Air Group 30 is proud of its record of protecting its bombing planes in 31 strikes without having a single pilot or aircrewman killed or wounded in combat. The group participated in invasions or strikes in the Gilberts, Nauru, Kavieng, Marshalls, Truk twice, Palau and the Hollandia-Wakde landings. In the March 31 strike on Palau, 14 of the group's fighters engaged 50 Jap planes, shooting down 19 and damaging seven without loss to themselves.

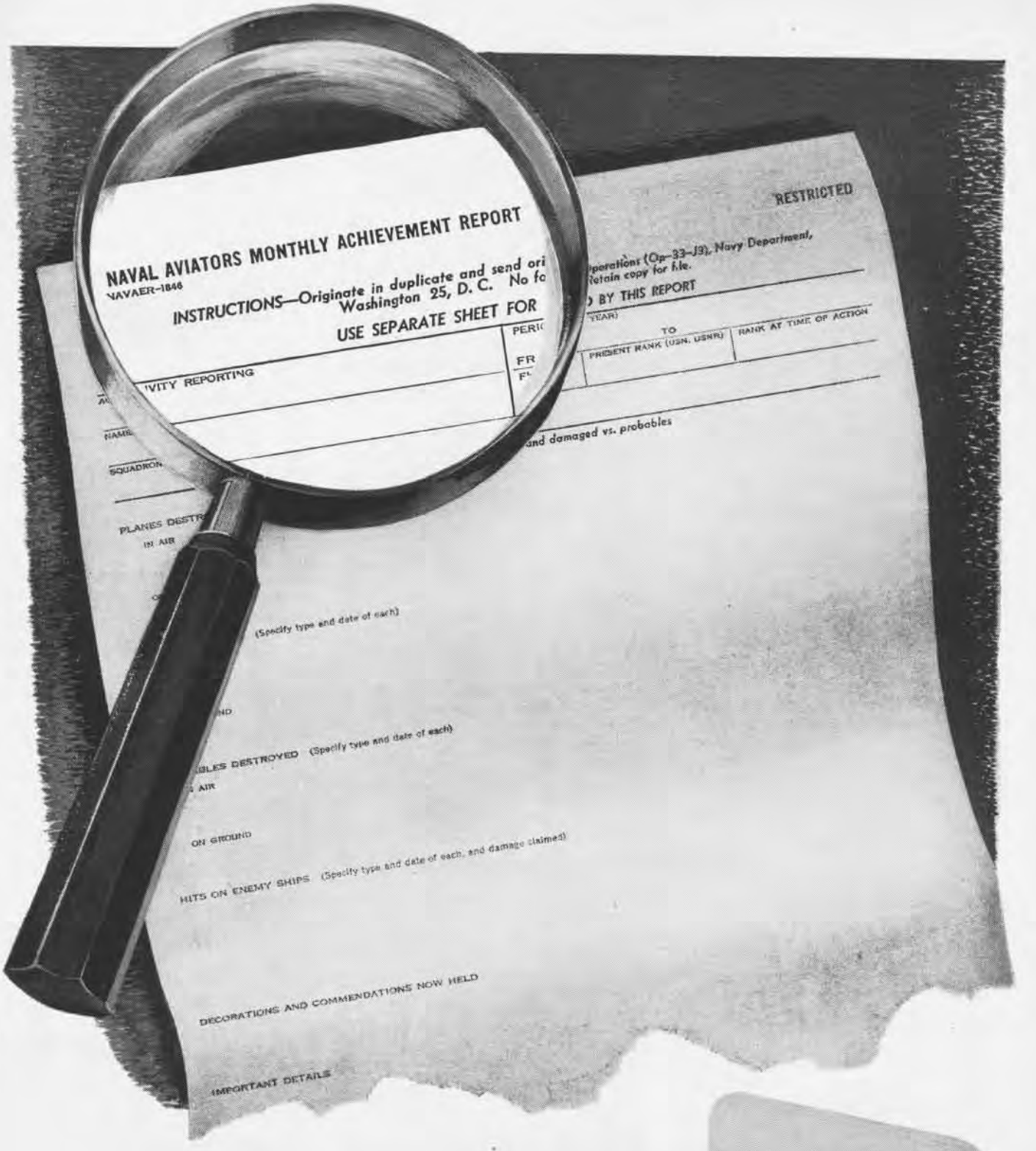
The *Sun Setters*, Air Group 23, were one of the first to operate on CVL's. In their record were such actions as Makin, Tarawa, Buka-Bonis, Rabaul twice, Gilberts invasion, Nauru, Wotje, Taroa, Eniwetok, Engebi, Parry, Palau, Hollandia. At Palau, its *Hellcat* squadron shot down 17 Jap planes and at Rabaul its planes torpedoed 2 heavy Jap cruisers, a destroyer, shot down 12 planes.

Bond Program Progressing

260,000 Air Personnel Buying

A recent report furnished the Assistant Secretary of the Navy for Air shows that over 100 aeronautical activities have 70 percent or more of their Navy personnel signed up with bond allotments, with only a handful of activities below the 50 percent mark. But there are more than two and a half times as many activities with a record of 90 percent or higher than there are activities with 50 percent or lower.

Aeronautical civilian personnel, totaling over 90,000, are 94 percent on the Payroll Savings Plan for about 11 percent of their pay. More than 260,000 Navy personnel at aeronautic commands ashore, within and without the continental limits, have bond allotments.



COMBAT ACHIEVEMENT REPORTS

Now Record Battle Action of Air Personnel

■ It will be easier now to report monthly on the records pilots and aircrewmen are ringing up. Specially prepared forms have been printed and distributed in pads with full instructions on how to report the aerial combat achievements of personnel. This information will be used in the Navy's official blow-by-blow description of the war.

These reports should be submitted regularly each month by the Historical Officer aboard, appointed in accordance with a recent directive of the Chief of Naval Operations. If the forms have not been received, ask Supply Dept. about Form NavAer-1846.

RADFORD BOARD DEVELOPS AERONAUTIC PROGRAM

NEWER and better planes in combat use, a higher percentage of planes ready for use on any given day, a greatly improved maintenance operation, and a big reduction in the headache of spare parts are some of the benefits expected as a result of the adoption of a new "integrated" policy and program by naval aviation.

The new program is the work of a special board appointed by DCNO (Air) to survey the situation and find opportunities for improvement.

Rear Admiral A. W. Radford, Assistant to the Deputy Chief of Naval Operations (Air), was senior member. Rear Admiral L. B. Richardson, Assistant Chief of the Bureau of Aeronautics, Colonel A. D. Cooley, Assistant Director Marine Corps Aviation Division, and Captain C. W. Fox, Director of the Aviation Supply Division of the Bureau of Supplies and Accounts completed the Board.

The Board covered the ground thoroughly. Reviews of Navy Air Statistics in Washington and special reports from Bureau officers furnished the starting basis. Then the Board took to the field. Meetings were held in Norfolk and Alameda. Representatives of both the Atlantic and Pacific commands contributed their experience, their opinions, and their suggestions.

What the Board found was generally good. The Naval Aeronautic organization had grown in a short period from a small organization to a big and powerful fighting force; the production problem was being licked; more planes were being built and they were better planes than the enemy was building; pilots were coming out of training schools in quantity and were better trained than pilots had ever been before. Combat operations had proved that naval aviation was *good* as well as *big*.

BUT THERE were some headaches. The maintenance problem was troublesome, particularly in the forward and rear combat areas and at the shore establishments in the U. S. Spare parts inventories had to be kept in hundreds of places, had to be big and had to have big pipe lines to supply them. Because the repair problem in combat areas was burdensome we were not able to keep as high a percentage of planes "operationally ready" as was desirable. Some of the planes in the combat commands had been there for a good many months and did not have all of the military advantages to be found in the newest planes just coming off the production lines.

It was apparent to the Board that most of these difficulties grew out of the use of planes in combat assignments for long periods of time. It was this long use which caused the loss of military advantage by comparison with the newer and better planes which were being made. It also aggravated the spare parts and maintenance problems because as experience indicated planes develop an increasing need for repair and maintenance after they are about a year old.

HOW TO GIVE the combat commands *more new* planes, keep the planes in combat use a *shorter* period of time, and still supply the needs of training and of forming and reforming squadrons out of the same total production of planes was the problem which the Board tackled and solved.

The key to the problem was an altered concept of plane use. Instead of using up the full life of some planes in combat commands and the full life of other planes in non-combat commands, the Board reasoned, why not use the first part of the life of nearly all the planes for combat assignments and the latter part of the life of the same plane for non-combat assignments.

The advantages of this new concept are immediately apparent. The planes in combat commands will be newer, will have more of the latest improvements, will need less repair.

When retired from combat their wear and tear will be removed through reconditioning and they will serve the needs of the training commands and of forming and reforming squadrons where the loss of military advantage will not be important since the planes will not be in combat with the enemy.

The Radford Board realized that fleet maintenance could be improved if it were possible to concentrate attention on the ideal of keeping all the planes on hand in a constant state of readiness. With the elimination of the extensive repairs required by older planes, the same number of man-hours can accomplish the lesser repairs needed by larger numbers of younger planes and thus the program can be brought closer to the ideal. The workload of the repair units will not be lessened, but applied to younger planes. It will be productive of better results for the fleet. The fleet will expect and insist upon better results and under the new program can get better results.

Less extensive repair in forward areas will mean that smaller parts inventories are needed in forward areas. Furthermore, planes not fit for reconditioning or re-use will be dismantled, used as spare parts, thus cutting down the supply of new parts from the factories.

Reconditioning of the retired planes will be in the major A & R shops in the U. S. where it can be handled best.

In order to assure that the potential gains in the maintenance field will be fully realized, the Board proposed several specific steps to be taken as promptly as possible.

As a result of these proposals the maintenance program will be strengthened by giving to maintenance a stronger voice in aircraft's design, by inaugurating accelerated field service tests of new models, by increasing the personnel of all A & R Departments to bring them up to full strength, and by establishing a field service branch and a closer liaison with maintenance establishments afloat.

WITH the new program comes an increased need for control statistics and provisions are now being made for setting up the necessary statistical organizations in the necessary places to supply these figures. Making the plan work effectively will require a real job of *teamwork*. Everyone involved, whether in the Fleet, the U. S. bases, or the Navy Department, who has a part to play must know that part and play it well. With that kind of teamwork the Radford Report and the integrated program will be the means of making the Naval Air Organization even better and even more effective than it has been in the past.

Photos Aid Torpedo Pilots

Train Men in Estimation of Speed

VT-11—Development of pilot technique in estimating target ship speed from wake and bow waves being considered of importance, particularly to torpedo plane pilots, a program of training was carried out in this squadron.

Pilots first were shown training slide film SN-1355. Four by five prints were made from various frames of that film and pictures posted, no more than four a day, with tabs attached stating the type vessel and its speed. Finally the same prints and pictures were posted daily, with tabs folded out of sight. Pilots were required to identify type and estimate speed within two knots.

TECHNICALLY SPEAKING

Pilot to Get an Escape Exit

Can Remove Window of Cockpit

VD-1—This squadron has perfected a pilot's escape hatch or exit for PB4Y-1 aircraft which requires no major structural change and can be easily replaced if desired.

The plane, unlike most multi-engine planes, has no escape exit in the pilot's compartment, although such a hatch would be valuable in ditching and other emergency landings.

VD-1's modification, devised by an ensign, makes it possible for the pilot to push out the window and escape in a hurry if necessary. The design is simple and can be installed in two hours. Standard size 3/16" x 2" steel aircraft bolts and washers are used and compression springs obtained from the recoil springs of a .50 cal. machine gun. Both the large and small springs were used, one inside the other. The safety wire pull is of steel piano wire.

In preparation for exit the pilot first pulls the safety wire. This leaves the window retaining panel free to bend out. He then opens the window slightly and pushes out and downward. With the window removed he can pull himself out after the plane has come to a full stop in the water.

[Design by Ens. S. B. Williams, USNR]

RIGGING PREVENTS DAMAGE TO TAIL SURFACES

This device holds the lifting cable clear of the tail surfaces during salvage operations, thereby eliminating additional damage. Detailed specifications of the attachment will be furnished to authorized activities upon request.

Factory Tool Is Improved

Wrench Applies Pressure Evenly

NAS Lake City—An improved hydraulic accumulator wrench has been designed here by three enlisted men which may take more time and materials than a standard type flat wrench but is a definite improvement in that even pressure is applied to the accumulator flange.

The standard wrench is not readily clamped in the vise to allow uniform torque application by the mechanic. Pins on the wrench which engage ⅜" holes in accumulator flanges, slip or break, resulting in damage to flange holes to the extent that the device cannot be repaired. The spherical shape of the accumulator also prevents clamping in a vise without damage to its surface.

The wrench is made in two parts. The lower section is clamped in a vise and engages holes in the lower part of the accumulator. The upper part engages holes in the upper part and allows maximum torque to be applied by the mechanic. This upper section is a form of bridge which extends to the accumulator flange and includes engage pins at each end. With equal force applied, damage to flange poles is reduced.

[Designed by F. W. Krause, AMMH1c; A. W. Padgett, AMMH3c, and L. W. Rowland, AM3c.]

Guard Prevents Accidents

Landing Gear Toggle Protected

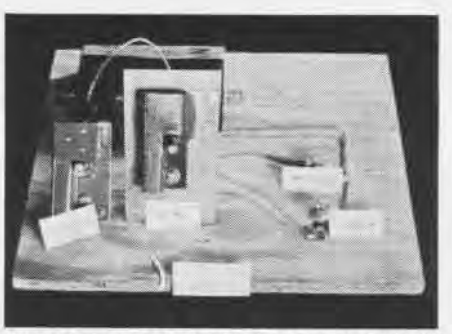
NAS New Orleans—Damage to an SNB when its landing gear retracted before the plane was fully airborne resulted in installation of a new type landing gear control switch guard to prevent future accidents.

The improved design guard made by A&R Department has more rigidity and less clearance between the guard in a closed position and the switch lever. It eliminates any possibility of retracting the landing gear accidentally, since the pilot must raise the guard to close the circuit and thus retract the landing gear.

SAFETY WIRE WILL PULL OUT TO FREE WINDOW

▶*BuAER COMMENT*—A change is being made in production and modification which extends the track and allows full opening of the side windows.

DESIGN NEW HYDRAULIC ACCUMULATOR WRENCH



GUARD PROTECTS LANDING GEAR TOGGLE SWITCH

The old guard had allowed the switch toggle lever to go beyond the normal neutral (OFF) position to a closed circuit (WHEELS UP) with guard closed.

▶*BuAER COMMENT*—The standard type snap guard (similar to AN3028 guard but for CENTER POSITION switch) cannot be used on this application because the pilot must be able to extend the wheels with guard in place. To retract the wheels, he must raise the guard and then pull switch toggle lever to wheels up position.

Device Aids F4U Salvage

Holds Lift Cable Clear of Tail Su

MCAS Mojave—A lifting device, designed and fabricated in the local A&R shop, has proved very useful in righting *Corsair* airplanes which have turned over on their backs during a landing.

Hose Assemblies Standard

Simplify Hydraulic Maintenance

To simplify maintenance of aircraft hydraulic systems and eliminate necessity for maintaining hundreds of sizes and lengths of hydraulic hose assemblies in stock, BuAer and the AAF have standardized a type of hose assemblies using detachable end fittings. In the event of hose failure, fittings may be removed and reassembled on a new hose cut from a bulk roll. Method of making hose assemblies in the field from bulk hose and detachable fittings is covered by TO 90-43 and TN 26-44.

Two types of hydraulic hose may be used with the standard types of detachable end fittings, *i.e.*, medium pressure hydraulic hose and medium high pressure hose. Hose conforming to Specification AN-H-6 "Medium Pressure Hydraulic Hose" consists of a synthetic rubber tube covered with 3 cotton braids. This is used for most hydraulic installations, and may be used through the dash 6 size for 1500 psi installation and from dash 8 size or larger in 1000 psi installations. AN-H-6 hose also is used in brake systems employing power brake valves, and in master brake systems when a small length is required.

Hose conforming to Specification AN-H-24, "Medium High Pressure Hose" consists of a synthetic rubber tube covered by one wire and two cotton braids. AN-H-24 hose is used in dash 8 sizes or larger in 1500 psi installations where AN-H-6 hose is not satisfactory, and in master cylinder brake systems which require long lengths of hose. Use of single wire braid AN-H-24 hose is necessitated in such installations by small quantity of fluid delivered by a master brake cylinder. Under pressure, hose tends to "balloon," thereby decreasing quantity of fluid actually delivered to the brake. Use of wire braid in AN-H-24 hose holds the tendency to "balloon" to minimum required for good master brake cylinder operation.

(Succeeds list of July 1, 1944) *1 August 1944*

THE FOLLOWING SHOWS THE NUMBER AND DATE OF ISSUE OF THE LAST SERVICE AND OBSOLESCENT AIRPLANE BULLETINS AND CHANGES

(Contract changes not included)

Airplane	Bulletin	Date	Change	Date
F6F-3	56	6-29-44	66	Undated
FM-1	25	6-6-44	52	6-5-44
FM-2	14	6-5-44	17	6-21-44
F4U-F3A-FG	74	7-4-44	182	7-15-44
GH-1	7	11-15-43	19	5-31-44
GH-2	0	0	3	6-21-44
AE-1	2	3-28-44	2	8-6-44
J2F-5	13	8-17-43	16	3-27-44
J2F-6	1	2-25-44	7	7-14-44
JRB-1	14	7-6-44	13	3-2-44
JRB-2	13	7-6-44	14	3-2-44
JRC-1	5	2-4-44	5	7-19-44
NH-1	0	.....	12	6-16-44
N2S-3	23	6-13-44	31	7-7-44
N2S-4	14	6-13-44	12	7-7-44
N2S-5	6	6-13-44	10	7-7-44
OS2N-1	32	6-24-44	33	3-3-44
OS2U-3	57	6-24-44	63	3-3-44
PV-1	59	7-20-44	146	7-6-44
PBJ-1	22	6-9-44	47	7-7-44
PBM-3D	9	6-7-44	41	7-22-44
PBM-3R	45	7-20-44	132	7-22-44
PBM-3S	21	7-20-44	76	7-22-44
PBN-1	4	7-6-44	50	7-19-44
PBY-5	55	7-6-44	166	7-6-44
PBY-5A	67	7-6-44	158	7-6-44
PBY-5B	12	6-6-44	36	3-13-44
PB2Y-3	40	7-22-44	143	6-19-44
PB2Y-3R	42	7-22-44	123	6-13-44
PB4Y-1	63	7-21-44	109	7-20-44
PB2B-1	5	7-6-44	3	6-22-44
R4D-1	25	6-14-44	29	6-16-44
R4D-2	11	6-14-44	3	1-6-44
R4D-3	17	6-14-44	16	5-2-44
R4D-4	12	6-14-44	3	2-21-44
R4D-5	18	7-12-44	17	6-16-44
R5C-1	12	3-19-44	76	7-5-44
R5D-1	2	7-21-44	79	7-13-44
R5O-5	11	3-31-44	12	6-9-44
RY-1	20	6-24-44	16	7-20-44
RY-2	5	6-13-44	6	7-20-44
SBD-3	85	6-12-44	155	6-23-44
SBD-4	40	6-12-44	67	6-23-44
SBD-5	52	7-24-44	73	7-20-44
SBD-6	12	6-19-44	11	5-30-44
SB2C-1	54	7-18-44	90	7-10-44
SB2C-1C	44	7-18-44	96	7-10-44
SB2C-1A	6	7-15-44	17	7-12-44
SB2C-3	31	7-18-44	47	7-10-44
SB2C-4	5	7-18-44	0	0
SBF-1	21	7-18-44	29	7-19-44
SBF-3	12	7-13-44	3	6-5-44
SBW-1	21	7-18-44	44	7-19-44
SBW-3	17	7-18-44	33	7-19-44
SNB-1	18	7-6-44	21	7-14-44
SNB-2	17	7-21-44	14	6-5-44
SNB-2C	7	7-6-44	6	6-5-44
SNJ-4	23	5-18-44	26	3-29-44
SNJ-5	7	3-1-44	8	5-29-44
SNV-1	21	7-5-44	51	5-22-44
SNV-2	5	7-5-44	5	5-22-44
TBF-TBM	111	8-1-44	198	7-13-44

Aerology Supplies Service

Gives Weather News at a Glance

NAS GLENVIEW—The aerology office here employs a system of supplying weather information that is typical of methods used by naval air stations. Special display racks are installed in the aerology office and in the air traffic control portion of dispatch room.

Sectional charts of areas, covered in detailed reports, are marked off for ready reference. Clipboards hold each teletype sequence with its detailed weather reports in code. Pilot balloon reports, upper air data, and airways

GLENVIEW PILOTS GET LATE WEATHER REPORTS

forecasts also are displayed on the racks, which are so arranged that pilots can get at a glance latest reports on weather conditions throughout the country.

▶*CNO COMMENT*—**Any system that enables pilots to obtain weather information with little effort is highly commendable.**

STUDENTS USE ASTRODOME DEVELOPED AT PENSACOLA TO TAKE SIGHTS IN CELESTIAL NAVIGATION WITH THE AIRCRAFT SEXTANT, MARK FIVE

STATIONS DEVELOP OWN TRAINING DEVICES

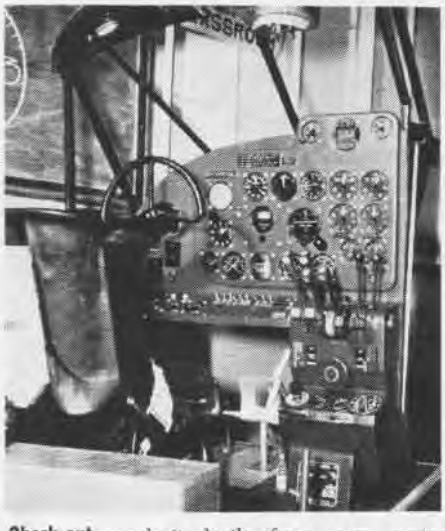
MANY NAVAL air stations about the country are showing considerable initiative in developing their own training devices to supplement those developed by the Special Devices Division.

A few of the numerous ideas which have been developed in the field are shown in the pictures on this page. At Pensacola, a mount for a battery of 22" Rohm and Haas astrodomes has been developed to use with the aircraft sextant, Mark 5. This device, which may be made locally by plans developed at Pensacola, provides proper support for the Mark 5 sextant and enables the student to practice in taking celestial sights through an astrodome. This device is illustrated above.

Corpus Christi developed the check-out cockpit illustrated below, left. The cockpit is of the SNB type. This model is an assembly of salvaged parts, dials and unprocurable equipment which has been put together to resemble the real thing. The device has been used to check out cadets in this type aircraft.

THE ROTOZONE deflection trainer, below, center, also was developed at Corpus Christi. It has proved a practical device to teach fixed gunnery deflection and range estimation. Speed of the target plane is variable and may be indicated in knots by the marker. The ball-like instrument in front of the target plane indicates the point of impact. The Mark 8 sight is used in the trainer. The table dial is marked in zones of 15, 30, 60, and 90 degrees relative to line of sight. A miniature sleeve may be used instead of a model plane.

The lower right picture shows a device developed at Memphis to demonstrate stalling speed of aircraft at various angles of bank and is being procured for use at primary and preflight schools to teach cadets the principles of flying and wing load factors.



Check-out cockpit built from SNB parts and dials helps Corpus Christi training

Deflection trainer teaches fixed gunnery deflection and how to estimate the range

Memphis device demonstrates stall speed of aircraft with various banking angles

PHOTOGRAPHY

▸Camera storage lockers are a necessity in the tropics. Without them corrosion and fungus attack are inevitable. An enclosed box or room of the desired size is the answer. Either mazda or infra-red lamps can be used to keep up the temperature. Once the moisture has been driven out, very little constant heat is necesary to maintain dry storage.

Training Provided in Camera Repair

Instructions currently being received by photographer's mates in camera repair schools at Fairchild and Eastman should help solve the problem of camera maintenance. Furthermore, proper maintenance should be stressed; with proper maintenance, and full instructions to photographers using cameras, the repair problem is greatly minimized.

VD squadrons operating in the Pacific consistently report few camera failures on reconnaissance missions. Use of proper storage facilities, inspection and cleaning of cameras after each mission, are "musts" with those outfits.

Highlights of reports from a Fairchild representative visiting Army and Navy Field units are: ¶ Camera trouble can be traced to improper storage and insufficient training of repair men. ¶ A log should be kept of all repair work performed. This is invaluable for later check-ups on causes of camera failure.

Color Photographs Is in Great Demand

There is an increased demand by the press for Navy color photographs. Demand is heaviest for action pictures, also human interest type such as "These are the men of the Navy," and "This is how they live and fight." Files also are deficient in good color photographs of vessels and equipment.

This appeal does not conflict with a recent *All Ships and Stations* letter regarding excess duplication of color prints. For press release the original transparencies are loaned to the news agencies.

Units shooting Kodachrome should bear in mind that color alone does not in itself make a good photograph. All the rules of good composition, quality, forces, etc. apply equally with the requirements of black and white. Exposed Kodachrome should be forwarded by air as rapidly as possible for processing, to avoid deterioration.

The war is moving with increased tempo—if a good pictorial record is to be made for posterity—action is required now.

▸Units having recently been added to the mailing list for Photography Technical Bulletins will receive all back copies and a binder when issues have been reprinted.

▸BuAer letter, Serial 158594, dated Nov. 9, 1942, points out the necessity of NAS' providing adequate service. Details of personnel and laboratory facilities are a problem to be worked out by naval activities.

Cabinet Protects Machines

Keeps Dirt, Dust from Mimeograph

VD-2—This squadron devised a small wooden cabinet to keep excessive dirt and dust out of its new mimeograph machine, to keep it from being handled by unauthorized personnel and to utilize space while machine is not in use.

With the machine in the cabinet, the top can be used as a table top. The operation of swinging the machine from stowing position into operating position

CABINET PROTECTS MIMEOGRAPH FROM DUST

is simple and can be done by two men, one at each end of the platform. When in place, two bolts lock the machine.

Metal Box Stows Markers

Float Lights, Dyes Easy to Reach

U.S.S. HORNET—Markers for indicating location of planes which crash in the water near a carrier can be stowed conveniently in a sheet metal box of a quick opening type, stowed near the landing signal platform and near the catapult deck edge control panel on the port or starboard side.

The markers consist of aircraft float lights, dye markers (¾ qt. size) and emergency rescue lights (Navy stock No. 17L7495). To ignite the nose fuse of the float lights positively, a tubular

CARRIER STOWS CRASH MARKERS IN METAL BOX

guide, shown as X in the accompanying picture, with a three-and-a-half-inch nail welded to the bottom plate, is used.

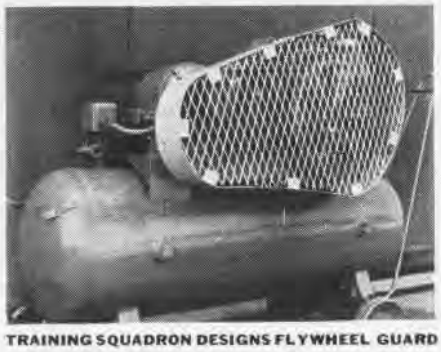
Most carriers have developed generally similar facilities, storing these markers in readily accessible places for use during flight operations. These boxes can be made by ship's personnel.

▸*BuAER COMMENT*—On smaller carriers, this size box may be an obstruction, therefore some ships prefer to install racks on appropriate gun or lookout shields.

Flywheel Guard Installed

Fits Portable Air Compressor

VN 8D5 ANNAPOLIS—As the portable air compressor (AR) 66-C-1457, stocked by ASO for issue to aviation units, is delivered without a flywheel guard, this training squadron installed one of its



TRAINING SQUADRON DESIGNS FLYWHEEL GUARD

own in about two and a half hours, with results proving entirely satisfactory.

Plate Aids Torquing Work

One Man Can Perform Operation

NAS CORPUS CHRISTI—Two aviation machinist's mates here won awards in the beneficial suggestion program by designing a fixture to facilitate torquing operations on R-985 and R-1340 counterweight bolts and expanders.

Fixture is primarily a plate or table upon which the counterweight is clamped during torquing operation. Plate has clamp that holds down counterweight and has center holes for proper alignment. In operation, worker places counterweight on plate, clamps it in place and starts torquing process.

FIXTURE CUTS TIME OF TORQUING OPERATION

When this is completed, plate (suspended in two bearings) is rotated and operation is repeated on the other side.

With the new fixture, one man can complete torquing job on an engine in three minutes. The job formerly required two men working 20 minutes.

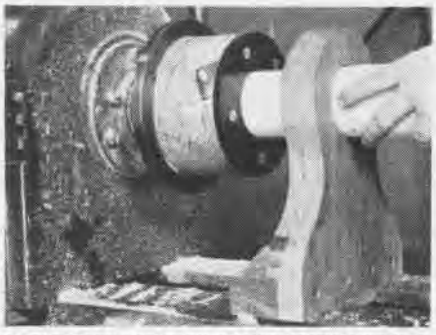
[DESIGNED BY LAWRENCE A. GATES AMM1C AND MILTON A. WESSELS AMM2C]

Plug Cutter Meets Demand

Patternmaker Device Saves Time

NAS QUONSET POINT—An excellent example of necessity's being the mother of invention bobbed up here recently in the beneficial suggestion program.

The station had been receiving an ever-increasing demand for standard wood plugs for exhaust and intake parts for certain aircraft engines. Ordinary production methods failed to keep abreast of needs. A patternmaker



STATION'S SUGGESTION DRAWS COMMENDATION

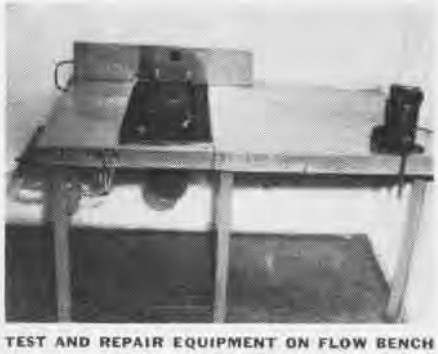
mounted a cutting blade on a round carrier, and the whole assembly was fixed to the face plate of a lathe. The plug to be cut was fed into the cutter through a specially prepared steady-rest by hand until the right depth was obtained. Then the job was taken to the circular saw, where it was cut to proper length. Four times as many plugs can be made by this method.

[DEVELOPED BY EDWARD H. DOCTOR, PM1C]

Hydraulic Bench for CVE's

Made from Salvaged TBM Parts

VC 63—A flow bench to repair and test hydraulic equipment of TBF's and TBM's aboard a Kaiser class CVE has been constructed in the ship's metal shop by the hydraulic specialist of this



TEST AND REPAIR EQUIPMENT ON FLOW BENCH

squadron. Before construction of the bench, there was no means to make hydraulic repairs, and faulty equipment had to be replaced, which represented a major problem since replacement parts were scarce. Equipment for the flow bench was salvaged from surveyed TBM.

[DESIGNED BY C. J. HODGE, AMM1C]

OXYGEN ENDURANCE CARDS

PILOTS of naval aircraft have often desired to know the approximate endurance of their high pressure oxygen supply at any particular moment during flight and without reference to complicated charts and graphs.

Endurance data shown below should be reproduced on 2"x3" cards for mounting in cockpits and crew stations for ready reference. Read altimeter, oxygen cylinder pressure gauge and cross reference both figures on endurance card at any time to find approximate oxygen supply in hours. Endurance data is given for normal air valve setting, diluter "ON."

Thus, the F6F photographic reconnaissance pilot, desiring to know how much longer he may remain at 30,000 ft. in the performance of his mission has that information at his finger tip. If the oxygen pressure gauge reads 900 psi, the pilot need only place his finger on the figure 900, travel horizontally across the card to the altitude column marked 30, in thousands of ft., and then read the figure 2. That figure 2 tells the pilot that he has approximately two hours of oxygen remaining in the airplane at 30,000 ft. The pilot may then plan the remainder of his flight.

BY DRAWING up similar charts, Aviation Equipment Officers may enter the endurance figures for airplanes where more than one person draws oxygen from the same cylinder, changing the lower line to read, "For Dil. Demand Reg. (size) cu. in. cyl. for (number) men." For example, in a *TBF*, three men receive oxygen from one source, a 514 cu. in cylinder. To supply the desired oxygen figures, the Aviation Equipment Officer refers to Figure 1. He notes that a full cylinder (1800 psi) has an endurance of 10 hours for one man at 15,000 feet. However, since three men use the same source, the available oxygen for each man is only one-third as much or equally proportioned to about three and three-tenths hours per man. The remainder of the data to complete the card is similarly obtained. Furthermore, the procedure is used in determining the oxygen duration for any number of people in planes equipped with standard 96, 205, 295 and 514 cu. in. cylinders.

HOURS OF OXYGEN PER MAN DILUTER "ON"

CYL PRESS	Alt. Th'sds Ft.	10	15	20	25	30	35
1800		8.5	10	9	6.1	5	6.5
1500		6.8	8	7.2	4.8	4	5.2
1200		5.1	6	5.4	3.6	3	3.9
900		3.4	4	3.6	2.4	2	2.6
600		1.7	2	1.8	1.2	1	1.3
300		DESCEND BELOW 10,000'					

For: Dil. Demand Reg.—One 514 cu. in. cyl.

FIG. 1—OXYGEN FOR PILOT IN AN F6F OR F4U

HOURS OF OXYGEN PER MAN DILUTER "ON"

CYL PRESS	Alt. Th'sds Ft.	10	15	20	25	30	35
1800		3.4	4	3.6	2.5	2	2.6
1500		2.7	3.2	2.8	2	1.6	2.1
1200		2	2.4	2.1	1.5	1.2	1.5
900		1.3	1.6	1.4	1	.8	1
600		.7	.8	.7	.5	.4	.5
300		DESCEND BELOW 10,000'					

For: Dil. Demand Reg.—One 205 cu. in. cyl.

FIG. 3—SB2C WITH 2-205 CU. IN. CYLINDERS

HOURS OF DXYGEN PER MAN DILUTER "ON"

CYL PRESS	Alt. Th'sds Ft.	10	15	20	25	30	35
1800		4.9	5.8	5	3.7	2.7	3.6
1500		3.9	4.6	4	3	2.1	2.9
1200		2.9	3.4	3	2.2	1.5	2.1
900		2	2.3	2	1.5	1	1.4
600		1	1.1	1	.7	.5	.7
300		DESCEND BELOW 10,000'					

For: Dil. Demand Reg.—One 295 cu. in. cyl.

FIG. 2—SUPPLY IN PB4Y, ONE CYLINDER PER MAN

HOURS OF OXYGEN PER MAN DILUTER "ON"

CYL PRESS	Alt. Th'sds Ft.	10	15	20	25	30	35
1800		1.6	1.9	1.7	1.1	.9	1.2
1500		1.2	1.5	1.3	.9	.7	1
1200		.9	1.1	.9	.6	.5	.7
900		.6	.7	.6	.4	.3	.4
600		.3	.4	.3	.2	.2	.2
300		DESCEND BELOW 10,000'					

For: Dil. Demand Reg.—One 96 cu. in. cyl.

FIG. 4—PB1 WITH PORTABLE 96 CU. IN. CYLINDER

NOTE: *All endurance figures were derived from TO 18-44 and are based upon an average inspiratory rate of 10 liters/min., a condition arising on a routine flight necessitating minimal pilot activity. Endurance figures for airplanes having lower ceilings may be omitted.*

87th & ANTHONY

Hydraulic Test Unit is Compact, Mobile

Simple, compact, and highly mobile, a new all-purpose hydraulic test unit developed in the Aviation Hydraulics School supplies one answer to the growing demand for greater speed on hydraulic checks.

Pressure of about 3000 psi can be developed by a booster cylinder with no manual effort other than simple flipping of the hand pump selector handle once or twice.

An interesting feature of the design is a multiple-purpose mounting post which takes either pumps or hydraulic motors. Vacuum, rpm, and temperature readings are given simultaneously with the indication of a pump's ability to work against certain pressures. A pump mounted on this post and set at a definite rpm can be used to give the plane system a definite fluid flow in gpm.

Static testing of units is quite simple, and static tests can be made even while the stand is being used for testing a plane's hydraulic system.

Because of its convenient size, the test unit can be rolled from plane to plane as desired for checking entire systems. Hydraulic flexible lines can be used to flush,

TEST UNIT IS SIMPLE, COMPACT, AND MOBILE

refill, or test a system with or without use of the plane's hydraulic reservoir. Various units such as bomb doors, landing gear, wing flaps, wing fold, etc., can be operated without the plane's power system.

When the test stand is not in operation, it can be used as a platform by mechanics to work on parts that are not accessible from the ground. A guard rail is posted on two sides as a safety measure for the workmen, and built directly on the platform is a tool box for the purpose of storing tools conveniently.

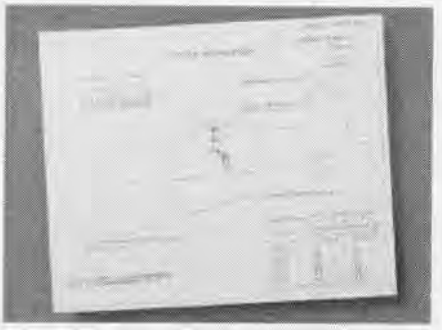
The test stand was designed by Lt. (jg) George Carr, Educational Officer of the 12-week course in Advanced Aviation Hydraulics given at this training center, and complete specifications are available via CO, NATTC, 87th and Anthony.

EDITOR'S NOTE: *Material for this column, which will be a regular feature, is submitted by* NATTC, *87th & Anthony, Chicago.*

Oxygen Installation Charts

Data on Major Equipment Given

In order to provide naval activities ashore and afloat with general helpful information on oxygen installation for



SAMPLE CHART GIVES COMPLETE OXYGEN DATA

specific aircraft, initial distribution of four charts of carrier-based airplanes has been made to the service.

These oxygen installation charts issued as airplane bulletins are designed to portray schematically the type, quantity, and approximate location and part number of major oxygen equipment items, and to give approximate endurance of the oxygen supply aboard at various altitudes and settings.

Airplane bulletins incorporating oxygen installation charts already released are as follows:

F6F	Airplane Bulletin No. 59
F4U—F3A—FG	Airplane Bulletin No. 82
TBF—TBM	Airplane Bulletin No. 113
SB2C-1	Airplane Bulletin No. 58
SB2C-3	Airplane Bulletin No. 36
SB2C-4	Airplane Bulletin No. 8
SBW-1	Airplane Bulletin No. 26
SBW-3	Airplane Bulletin No. 22
SBF-1	Airplane Bulletin No. 24
SBF-3	Airplane Bulletin No.14

Additional oxygen installation airplane bulletins for other aircraft will be forthcoming from time to time.

▸ Copies of charts listed above may be obtained, if desired, by sending request to BuAer, Attn: Publications Section.

Fast Weather Map Service

Serves Aerology Training Need

NATC CORPUS CHRISTI—Guided by actual weather-maps printed daily giving up-to-the-minute meteorological data, aviation cadets at this training center now "fly the weather" either in the cockpit of a Navy plane or at a classroom desk. The NATC Aerology Training Division supplies the maps. Data is gathered at the NATC Aerological Office, and is comparable to that used officially throughout the world.

The daily aerological maps, 20" by 17" in size, are produced on a fast schedule, ready for distribution at 0630, with the day's aerological conditions from all available sources in the United States. From this data, pilots and aviation cadets plot real or hypothetical flights between any points in the country. Weather changes are issued hourly throughout the day so that maps may be revised accordingly.

Publishing System Guarantees Speed

Training needs require maps to be prepared late enough to include current data, but distributed early enough for morning classes and training flights. At 0130, meteorological readings are taken, and nation-wide weather data, received by teletype, are compiled and entered on the map.

At 0430 the map is analyzed by the Aerological Officer, and local conditions for various parts of the country indicated. The map is sent to the multilith shop at 0530 for photographing and reproduction, and at 0630 finished maps are ready for distribution to outlying fields by plane or fast motor truck.

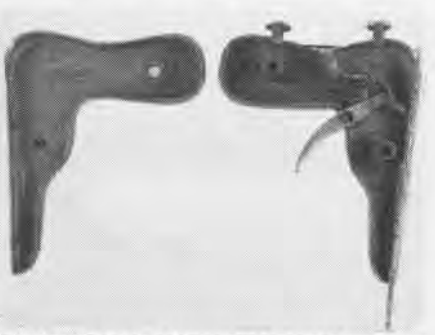
Feeder Gun Aids Soldering

Employee's Suggestion Wins Prize

PORTSMOUTH NAVY YARD—To expedite and improve the quality of silver soldering operations at this activity, a civilian employee devised a feeder gun for silver solder wire and won a prize in the beneficial suggestion program.

The gun is simple in construction, easy to operate, light in weight, and inexpensive to manufacture. The soldering is accomplished by inserting the wire in the gun and feeding the wire to the job by a cam-actuated mechanism incorporated in the gun itself.

One of the principal advantages gained by use of the gun is the facilitation of intricate silver soldering operations. The barrel of the gun prevents defection of the fine solder wire by the rush of gases from the gas welding torch. Wire of 1/32" diameter is con-



WORKER DESIGNS FEEDER GUN FOR SOLDER WIRE

sidered more economical to use than heavier types of silver solder wire because it can be fed into the soldered joints with a minimum of solder run-off.

Use of the gun makes possible production of more uniform welds and insures protection to the worker's hands by keeping them away from torch.

[DEVISED BY EVERETT M. HUNT]

WHITING FIELD'S USE OF BATTENS ON SURFACES PROVIDES DEPENDABLE PROTECTION AGAINST HIGH WINDS OF TYPE THAT PREVIOUSLY DAMAGED 40 SNB

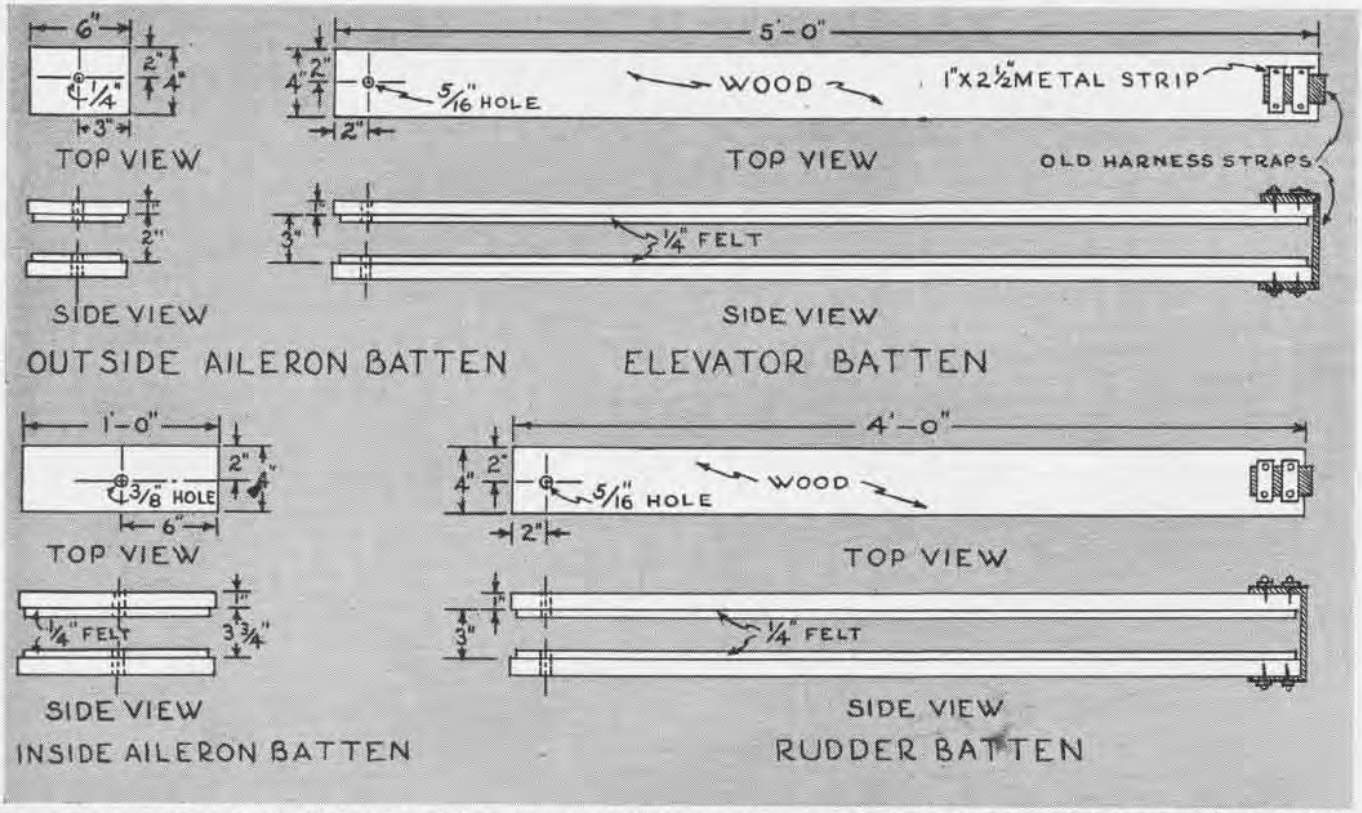
PROTECTION

Battens Gives Answer to Damage by High Winds

NAAS WHITING FIELD—Mere securing of planes against high winds is not enough to prevent damage, the experience of Whiting Field confirms. Although its planes were securely tied, forty SNB's were seriously damaged in measured winds of 53 and 44 knots owing to the fact that their controls were held fast by an interior lock only, resulting in failure of control locks, elevator cell cranks and control systems.

To prevent recurrence of this calamity, the squadron devised new elevator, aileron and rudden battens (*illustrated*). Control surfaces then were protected by the felt-lined, adjustable battens that lie flush against the surface on either side to insure double security.

Installation of the remedy soon after proved effective, when in a measured wind of 47 knots that swept through the line, no damage whatever was reported.



SPECIFICATIONS ABOVE CALL FOR BOLTS 4¼"X5" WITH WING NUTS 2¼"X6" AND 2¼"X4" IN POSITIONING BATTENS ON AIRPLANE CONTROL SURFACES

POWER PLANTS

Diaphrams Must Be Soaked Thoroughly

Occasional reports are received of trouble with newly installed carburetors in starting and ground running. Back firing and rough ground operation is noted until some hours later—one report states "until the diaphrams become pliable."

The trouble indicates possible failure to comply with General Engine Bulletin No. 6, "Preparation of Stromberg Injection Type and Holley Diaphram Type Carburetors for Storage." Paragraph 4(b), GEB 6 states:

> "Fill *all* fuel chambers of the carburetors and adapter, if any, with gasoline—then *allow the carburetor to stand filled with fuel, for an absolute minimum of eight hours.* This soaking period is very important, as the carburetor was originally calibrated with all of its fuel diaphram thoroughly soaked with gasoline, and *these diaphrams must be restored to this condition before the carburetor can be expected to function properly again.* Twelve to sixteen hours soaking is preferable."

SBF Fuel Tests Comparable With SB2C

Comparative tests show that SBF-1 airplane performance is in close agreement with SB2C-1 performance at the same loading and configuration. The airspeed meter calibrations are nearly identical.

Fuel consumption tests were run on an SB2C-1 airplane early in 1943, and the results are available in SB2C-1 Supplementary Operating Instructions (NavAer 01-25RA-501), revised 22 December, 1943. As this report can be used without modification for figuring fuel consumption of SBF-1 airplanes, squadrons flying SBF-1's should requisition as many copies of the report as are needed.

DC-4 Compound Used in Ignition System

General Engine Bulletin No. 21 introduced a Dow-Corning ignition system sealing compound known commercially as "DC-4" compound. The use of this compound excludes air and moisture from the various clearances and tolerances of the cable terminals and connections, thereby increasing the flash-over resistance at these critical points. With increased flash-over resistance, general ignition system performance and altitude characteristics improve.

When General Engine Bulletin No. 21 was distributed, the supply of "DC-4" compound and injector guns was inadequate for general usage and their use was restricted to high altitude engines only. At the present time the supply of the compound and injector guns is sufficient to warrant general distribution to all naval air activities. BuAer recommends the use of this compound on all engines operating in moist climates, at altitude, or any engines in which general ignition system difficulties caused by flashover have been encountered.

CVA Will Issue New Forms

Service Trouble Report Is Revised

Within two months CVA will issue a new form of its 6169 report on service troubles. This report, revised monthly, is an outgrowth of the former Master Chart of Service Troubles. The book form report has been found more suitable for the F4U, F3A and FG set-up.

In place of the ozalid report CVA is preparing a mimeograph processed report for the convenience of the services within the continental limits. The report will cover, as does the older form, a brief description of changes with all parts affected, drawing numbers concerned, shipment of change parts and a check off list in the index, so that personnel can have a definite indication whether all changes have been incorporated in *Corsairs* assigned to them.

Included is an indication of service troubles (Master Change Records are the same thing) that the contractor has in process before the official BuAer notification is issued. When an RUDM is to be issued on a persistent trouble, the CVA report may show advance work on the same thing. This gives a definite reference. The report contains a comprehensive index of all changes. Any activity in the States concerned with *Corsairs* may write to BuAer and they will be put on mailing list for report.

New 2-Course Landing Tee

Now in Use at Henderson Field

PACIFIC FLEET—The normal airfield in the Pacific consists of a single strip bearing into the prevailing wind. Direction of landings and take-offs is indicated by a landing tee, and at times by a colored ball swung from tower.

Experience at Henderson Field proved that an extra large landing tee was desirable, especially during tactical operations with tower operating under radio silence, the ordinary swinging type being unwieldy in large size.

The tee diagrammed by NANEWS (*see cut*) accordingly was constructed by Seabees under a Casu's direction from materials readily available at most fields. In use a number of months now, it is liked by both pilots and the tower crash crew operating it. With this type of tee, one man can change the course in a matter of seconds.

Simple Construction Details Show Value

Two stationary wings are each 12' long, mounted on stakes 1' above the ground. Framework is of wood covered with canvas or osnaburg, doped and painted yellow. Movable center section is 40' long, fitted with wheels and axles from an old bomb dolly. Frame also is of wood covered with canvas. Runway on which the center section moves is made of Marston Mat.

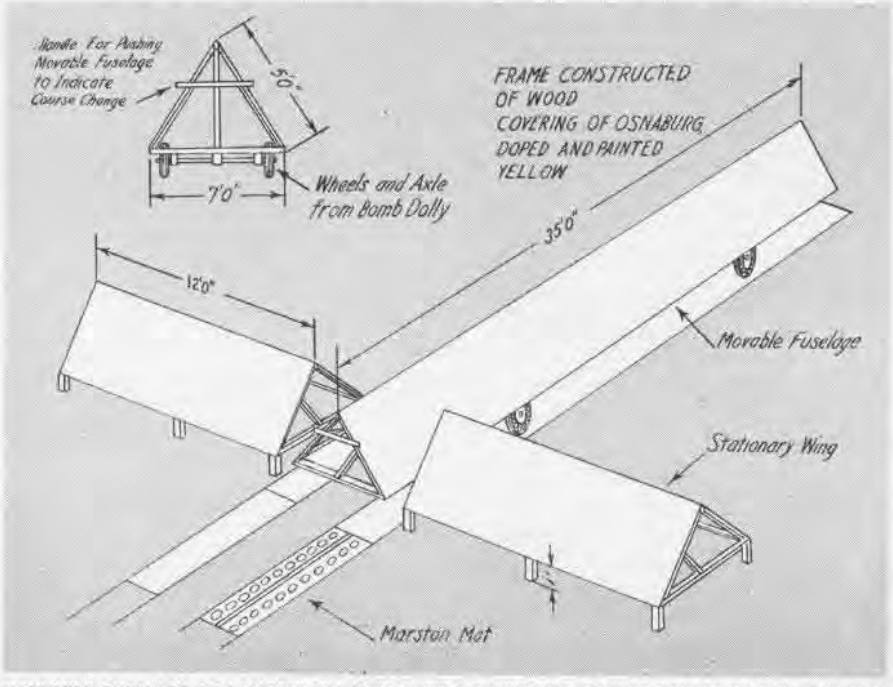
[DESIGNED BY LT. D. W. FOLLETT]

Farmers Phone in Crashes

Pensacola Installs Special Phone

NATC PENSACOLA—A special direct telephone line for reporting airplane crashes by anyone in the vicinity of the Naval Air Training Center has been installed here.

Designed to expedite relaying information on crashes involving naval aircraft, the phone is expected to speed up rescue operations. Incoming calls reporting crashes may be made "collect," with charges paid by the Navy.



MOVEABLE FUSELAGE OF LANDING TEE IS MOUNTED ON WHEELS, CAN BE ROLLED TO NEW POSITION

Question 1

The dotted line marks the...

1. Chord
2. Camber
3. Mean camber line
4. Center of gravity

Question 2

At slightly negative angles of attack, an airfoil may still give lift because of...

1. Increased drag
2. Increased pressure
3. Reduced drag
4. Shape of airfoil

Question 3

These measurements give us the...

1. Aspect ratio
2. Mean line
3. Loading ratio
4. Thickness ratio

Question 4

When this takes off...

1. Thrust must equal weight
2. Thrust must exceed drag
3. Thrust and drag must be equal
4. Drag must exceed thrust

PIX QUIZ What Do You Know About AERODYNAMICS?

Most of us take the air pretty much for granted, but when we stop to consider all the factors involved in keeping an airplane in flight, it becomes a rather complicated subject. However, these questions, taken from an aerodynamics quiz, will be very simple for most personnel in naval aviation. Allow yourself 30 seconds for each question, then turn to page 40 to check correct answers.

[Questions from BuAer Special Devices Visual Quizzer Film No. 24, Aerodynamics]

Write your answers here

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

Question 5

When "A" is increased, force of gravity...

1. Becomes greater
2. Remains the same
3. Becomes slightly less
4. Decreases considerably

Question 6

For this attitude...

1. Thrust must exceed drag
2. Lift must exceed weight
3. Thrust must equal drag
4. Drag must exceed thrust

AVIATION ORDNANCE

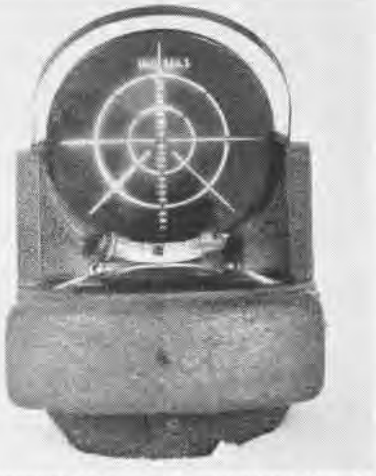
INQUIRIES SHOULD BE ADDRESSED TO THE CHIEF OF BUREAU OF ORDNANCE

Spare Parts for 20mm Belting Machine

Major supply points are being furnished with spare parts, including belts, for the 20mm Belting Machine Mark 5 (hand operated crank). Activities requiring spare parts for this machine should order them in accordance with Ordnance Circular Letter V26-43 from the nearest supply point handling aviation ordnance equipment. Requisitions should identify parts by their proper nomenclature and drawing number and also by stock number, if known. A list of parts with illustrations, proper nomenclature and drawing number will be found in Ordnance Pamphlet 974.

Ladder Sight Reticle Has Advantages

With the development of the masthead bombing technique and the use of forward firing rockets from aircraft, a new sighting problem was presented. It was evident that the trajectories of bombs released at low altitudes from planes traveling at high speed, and the trajectories of



CORRECTIONS ARE MADE ON SIGHTING LADDER

forward fired aircraft rockets were sufficiently short and flat that the sighting allowance could be made by the pilot using his fixed gun sight. The Illuminated Gun Sights Mark 8 and Mark 9 were modified to aid the pilot in compensating for the greater gravity drop in bombs and rockets resulting from their longer time of flight.

A change in the Illuminated Gun Sights Mark 8 and Mark 9 to adapt them to their new use was the addition of an adjustable reflector which permitted the pilot to depress his line of sight through any desired angle up to 25° thus raising the line of flight above the target an amount necessary to allow for gravity drop. While the theory behind the adjustable reflector was sound, and good results could be obtained when it was used carefully, it was soon discovered that pilots under the stress of action sometimes made the wrong angle setting on the adjustable reflector plate or forgot to return the plate to its zero setting when it was to be used in sighting forward firing fixed guns. Furthermore, it added one more manual operation to those imposed upon the pilot.

The ladder reticle, the pattern of which is shown in the illustration, was another proposal as a sighting aid for forward firing rockets and masthead bombing. As installed in the Illuminated Gun Sight Mark 8, the reticle has a ladder graduated in 10 mil increments on its vertical centerline. There are 10 increments above and 15 increments below the pip, giving an angular visual sweep of plus 100 mils (5.7°) to minus 150 mils (8.6°). Since no Navy VF, VTB, or VSB airplane has a forward down vision over the nose exceeding 8°, the maximum usable limits of down vision are met by the range of ladder reticle.

The great operational advantage of the ladder reticle over the adjustable reflector is that the sighting correction for angle of attack and range can be put into the line of sight visually by the pilot by selecting the "rung" on the ladder to be used as the reference point for the line of sight. This visual correction can be made accurately within five mils. The impossibility of distortion of the reticle image through vibration, the absence of maintenance problems, and quick and easy production are other factors which have influenced a decision to limit procurement of adjustable reflectors, standardize on the ladder reticle.

Ladder reticles have been scheduled for installation in all Mark 8 production sights after 15 August 1944.

New Rear Mounting Post, Trunnion Bolt

An improved rear mounting post and trunnion bolt have been developed to supplant the existing Rear Mounting Post Mark 1 and Trunnion Bolt Mark 1 as fixed mounts for caliber .50 BAM guns in new aircraft. The new designs, known as Rear Mounting Post Mark 4 and Trunnion Bolt Mark 4 first made their appearance in August in F6F-5 and FR-1 aircraft, and are scheduled for installation in FM-2, F4U-4, FG-1, F2G-1 and TBM-3 airplanes by December of this year.

To permit the use of elastic stop nuts, which require no additional lock nuts or washer, the flats on the rear mounting post have been eliminated. An additional important feature in the design of the new mount is the pin pullout type of detachment which makes for quicker and easier removal of the gun from the mount. Most important, however, is the fact that the Mark 4 rear mounting post provides a better type of boresight adjustment, and retains adjustment when guns are changed.

Rear Mounting Post Mark 4 is shown in BuOrd Drawing No. 422076 and has been assigned Stock Number 1-P-10838. Trunnion Bolt Mark 4 is shown in BuOrd Drawing No. 422350, Stock No. 1-B-4535-400.

Hydraulic Reservoir Plug

Two Wrenches Used to Secure

All maintenance personnel are cautioned to remove or secure the hydraulic reservoir filler plug properly.

Both torsion and bending forces are imposed upon the filler neck found in most reservoirs when a wrench is applied to the filler plug. The reservoir material is comparatively soft and easily cracked.

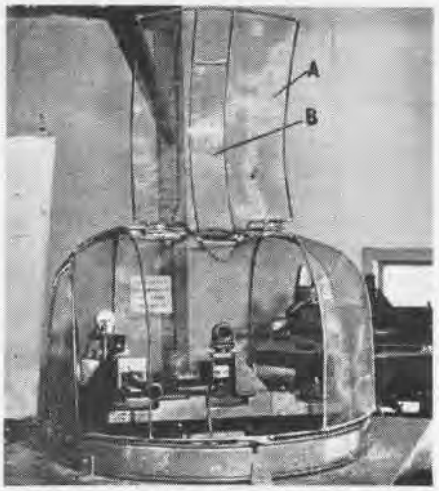
Two wrenches should be used for this operation, one of which may be an adjustable Stillson.

Grip the top of the filler neck with the adjustable wrench to prevent twisting and apply the second wrench to the top of the filler plug. To prevent scoring the filler neck, place one or two thicknesses of cloth between the wrench jaws and the filler neck.

Screen Protects Students

Keeps Clay Pigeons Off Gunners

NAAS KINGSVILLE—A chief gunner at this station has designed a screen dome for Crocker Wheeler training tur-



WIRE SCREEN KEEPS FLYING BITS OUT OF EYES

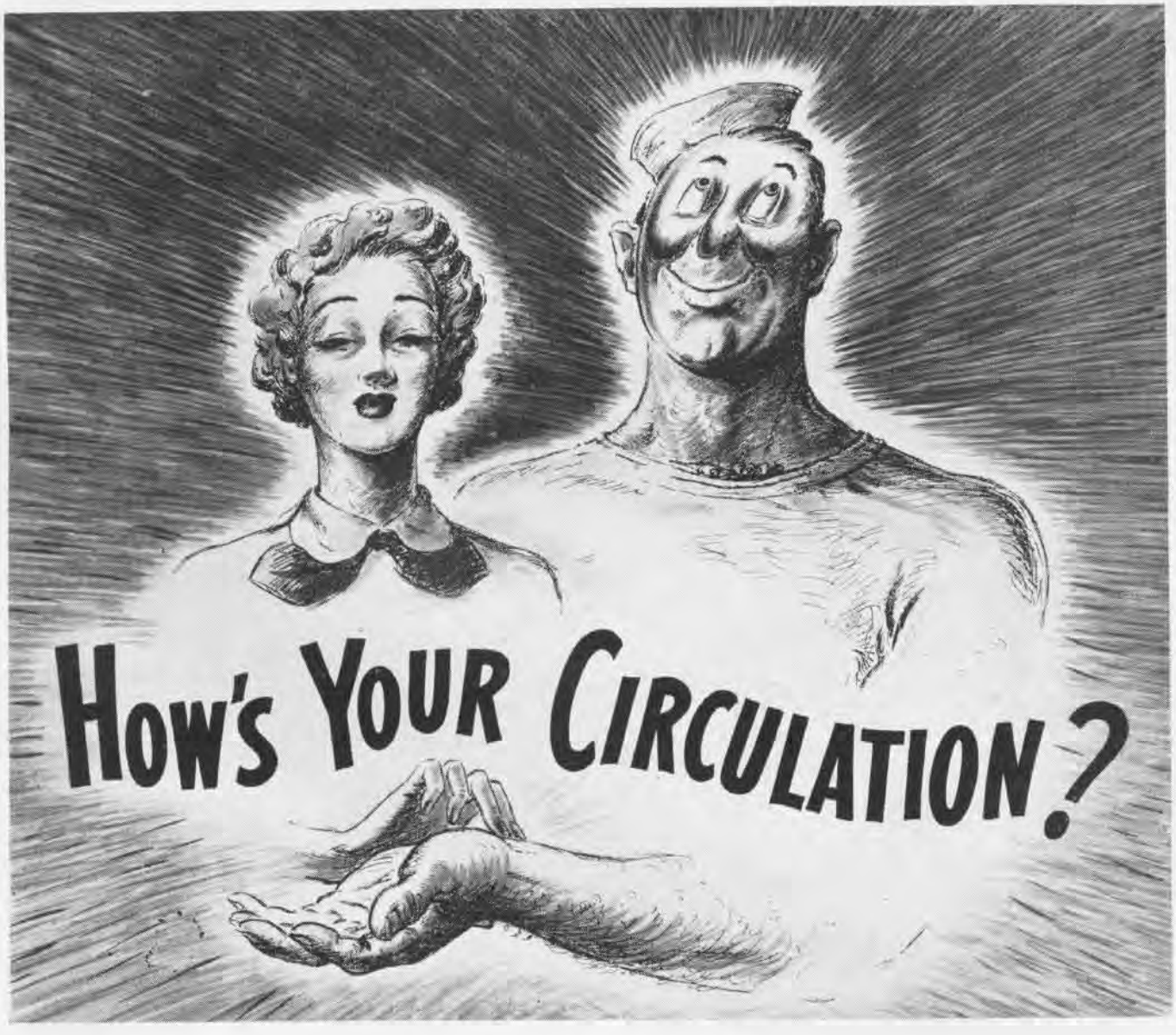
rets to protect students from pieces of broken clay pigeons and reduce excessive heat in turret, which is a problem.

Hinged flaps, A, give easy access to Mark 4 operational reflector sights for bore sighting and adjustment. A plexiglas insert, B, in the hinged flap allows perfect vision through the reflector sight.

[DESIGNED BY CHIEF GUNNER S. A. MCDOWELL]

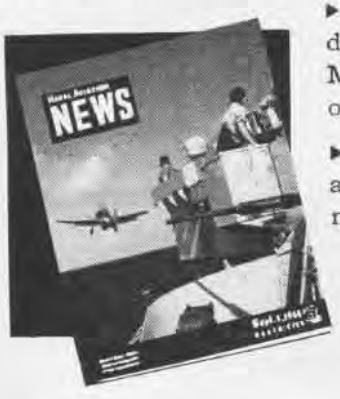
▶ ***BuAER COMMENT*—This looks like a good idea. Pieces of target put out eyes.**

¶ An emergency equipment container which floated, recently saved the life of an AOM1c with a TBF squadron. The plane crashed in the water at high speed after the engine had been hit by Jap AA fire. The turret gunner found himself in the water, stunned, his Mae West made unserviceable by the crash. But he found the emergency equipment container floating nearby, got it between his legs, and rode on it until other planes dropped a raft.



IF NAVAL AVIATION NEWS made the rounds at your activity the way life-blood pulses through your system, all would be well. Alas it doesn't! Surveys taken in the field show *NANews* isn't being received and read by many for whom it is published. Activities—a great many of them—are suffering from internal hemorrhage in distribution of publications.

▸Nobody's fault, mind! Activities have mushroomed and are always changing or being shifted. The personnel picture is fluid. And it's no cinch to keep track of oceans of literature pouring into ships and stations.



▸*NANews* contains technical, safety, survival data useful to all enlisted men in aeronautics. Many want to see it, but can't get their hands on copies (some have offered to pay for it).

▸You can help, if a *reader,* by passing this copy along to another—if *distribution officer,* by making sure your station coverage is thorough.

✓SAMPLE CHECK LIST

If security permits, there are many places to plant copies to make sure readers can get 'em.

CLASSROOMS	ACI OFFICE
BARRACKS	RECOG. OFFICE
BOQ	A&R SHOPS
DIVISION HEADS	READY ROOMS
	SICK BAY
CHAPLAIN	LIBRARY
	RECREATION ROOM

GET THIS COPY TO 10 READERS

IT'S OUT...GET IT AROUND!

LETTERS

SIRS:

Reading your June 1 issue of NANEWS, the article "Japanese Searchlights," I see you refer to American-made searchlight, made by Sperry, as a Japanese searchlight.

S/SGT. EDWARD ACUNTO,
800th AAF Base Unit
Stout Field, Indianapolis

¶ In the years before Pearl Harbor, the Japs bought large quantities of military equipment and scrap metal from United States and are now using it against American forces. This searchlight was one so obtained and put to use by the Japanese army.

SIRS:

This unit is anxious to obtain 50 copies of the June 15 edition of NAVAL AVIATION NEWS. We are particularly interested in articles dealing with aircrewmen, and would appreciate any excerpts or photographs on this subject. Students at this school are extremely interested in this material and are eating it up. Congratulations on your presentation of this subject.

LIEUT. (J.G.) USNR
Aviation Free Gunnery Unit
NAS Whidbey Island

SIRS:

Just a suggestion from the Air Corps, if you don't mind.

With reference to the method of marking targets, as noted from the picture on page 42 of the July 15, 1944 issue of NANEWS, we have a method which is probably faster and easier.

Into a 2" piece of rubber hose is inserted the neck of a spent cal. .50 case. The inside diameter of the hose being such as to insure a tight fit on the cartridge case. The free end of the hose is the marking end; by dipping it into a small can having a pad of cotton soaked with marking ink in the bottom, bullet holes can be spotted (or ringed, the way this works) lightning-like.

LESTER J. ROSE, 2ND LT. A. A.
Aerial Gunnery Officer
Clovis Army Air Field, N. M.

SIRS:

The officers and men assigned to this school have followed your publication with extreme interest and enjoyment. It has most assuredly been a source of a great deal of information which has been most helpful and enlightening along many lines pertinent to naval aviation. I further wish to express my appreciation for having received NANEWS over the past several months and my keen interest in it.

LIEUT., USNR
Resident Naval Officer
CAA-WTS School, Lafayette, La.

CONTENTS

PUBLISHED TWICE MONTHLY BY AVIATION TRAINING DIVISION, OFFICE OF CHIEF OF NAVAL OPERATIONS AND BUREAU OF AERONAUTICS, NAVY DEPARTMENT—NUMBER 224

ANSWERS TO QUIZZES

- **NAVIGATION PROBLEM** (on page 24)

1. (+) 50' 2. 33° 13' 3. 280
4. Lat. 27° 03' N. Long 172° 22' E

- **SURVIVAL QUIZ** (on page 22)

1.c 2.b 3.c 4.c 4.d 6.c
7.b 8.c

- **PIX QUIZ** (on page 37)

1.3 2.4 3.1 4.2 5.2 6.3

Films available from BuAer, Special Devices, for showing in Visual Quizzer, Device 5-X. Standard slide film versions may be obtained from Training Films.

PUBLICATIONS

The following Aviation Circular Letters, Technical Notes and Technical Orders have been issued since 1 July, 1944. Copies are available on request to Publications Section, Bureau of Aeronautics.

AVIATION CIRCULAR LETTERS

58-44 *Control Tower Radio Interference.*
59-44 *Synthetic Rubber Fuel and Oil AN-884 Hose Connections, Reuse of.*
60-44 *Maintenance Stocks of Ordnance Type Synchros.*
61-44 *Gun Camera Film—Change in Cognizance of.*
62-44 *Reports Regarding Service Deficiencies—Forwarding of.*
63-44 *Hurricane Evacuation.*
64-44 *Aircraft Reporting System—Revision of.*
65-44 *Advancement of Cash Outside the Continental Limits of U. S.*
66-44 *Aircraft Structural Change Material—Issuance of.*
67-44 *Expeditious Handling of Class 965 Materials Requiring use of Crude Rubber.*
68-44 *Insignia on Aircraft of Allied Nations.*
69-44 *Aircraft and Engines—Policy Regarding Reconditioning and Overhaul by Civilian Contractors.*
70-44 *Aircraft Reconditioning and Aircraft Engine Overhaul—Distribution and Scheduling of.*
71-44 *Quarterly Link Instrument Trainers Report, Request for Submission of.*
72-44 (Cont.) *Aircraft—Striking and Disposition of.*
73-44 *Instructions in Regard to Ferrying of Naval Aircraft.*
74-44 *Historical Officers, Designation of.*
75-44 *Publicity of Court Martial Proceedings and Other Punishments for Violations of Flying Regulations; Policy Regarding.*
76-44 *Standardization Identification Markings for liquid fuel pipelines.*

TECHNICAL NOTES

C-44 (Conf.) *Aircraft Radio AN/APN-4 and SCR-722A, New Frequency and Basic Pulse Rate—Adjustment of.*
D-44 (Conf.) *Model AN/ARC-1 Communication Equipment—Unusable Combinations of Frequencies for.*
55-44 *Pneumatic Life Vests—Installation of Back Strap.*
56-44 *Replacement Program for RL-5 Interphone Equipments and Approved Modifications for Limited Application.*
57-44 *Modification and Inspection of Leece-Neville Type L-3, M-3, E-5A and 1001-3 Generators.*
58-44 *Eclipse Type 1305-1A, 1322-1A, 1001-4A, 1260-1A, 1001-2A and 1002-1A Carbon-Pile Voltage Regulators—Shock Mounting of.*
59-44 *Boresight Patterns for Fighter Airplanes.*
60-44 *Expended Link Ejection Heads, Mk. 45, 90, 90 X, 90 X X and 180—Installation Instructions for.*
61-44 *Index of Technical Orders and Technical Notes.*
62-44 *Repairing Worn Heels on Aviators' Flying Boots—Electric Vulcanization.*
63-44 *Landing Gear—Tire Casings—Nylon Cord Construction—Elimination of Flatspots.*
64-44 *Droppable Fuel Tanks—Capacities and Types of.*
65-44 *Electrical Windshield Wipers—Operation of.*
66-44 *AN/ARC-4 Series (WE-233A) Transmitter-Receiver, Improved Fusing of with "Slo-Blo" Type Fuses.*
67-44 *Adjustment of Type NAF 1116-4 Cutouts after Installation.*

TECHNICAL ORDERS

88-44 *Model JRB-3, and -4 Airplanes—Restrictions and Permissible Maneuvers.*
89-44 *Model J2F-5, -6 Airplanes—Restrictions and Permissible Maneuvers.*
90-44 *Model OY-1 Airplanes—Restrictions and Permissible Maneuvers.*
91-44 *Life Raft Inflation Gear Safety Sealing Wires—Modification of.*
92-44 *Use of Cluster Adapter, M-12—For Increasing Bomb Carrying Capacity.*
93-44 *Model AE-1 Airplanes—Restrictions and Permissible Maneuvers.*
94-44 *GP-6, -6A, -7 Transmitting Equipment—Power Factor Correction Capacitors, Disabling of.*
95-44 *Identification — Installation — Inspection—Storage and Handling of Aircraft Hose.*
96-44 *Model R5D-1 Airplanes—Restrictions and Permissible Maneuvers.*
97-44 *Weight and Balance Control.*
98-44 *Use of Cluster Adapter, M-12—For Increasing Bomb Carrying Capacity.*

This gunner has orders to shoot down U.S. Pilots!

This gunner, like every Navy gunner, has orders to shoot down *all* planes that come in at his ship without identifying themselves.

Tragically, that sometimes means U.S. planes as well as enemy planes. For when a pilot forgets to follow the rules of identification, the gunner has no choice.

His ship, and the lives of his shipmates, depend on his getting the plane before the plane gets him. He can't hold fire until identification has been made. He can't take chances.

So don't *you* take chances. *It's your responsibility as a pilot to identify first.*

Learn the identification rules—and follow 'em to the letter!

Identify

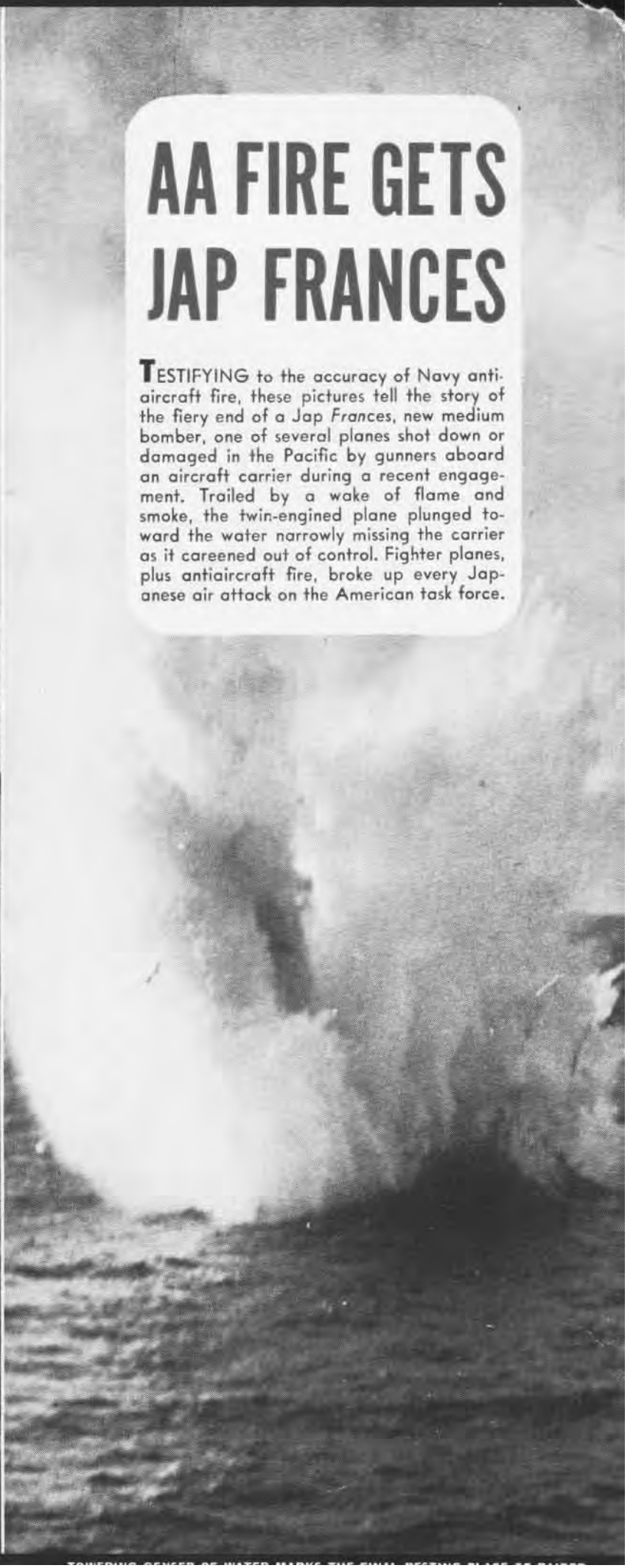
WHEN APPROACHING ALLIED SHIPS!

AA FIRE GETS JAP FRANCES

TESTIFYING to the accuracy of Navy antiaircraft fire, these pictures tell the story of the fiery end of a Jap *Frances*, new medium bomber, one of several planes shot down or damaged in the Pacific by gunners aboard an aircraft carrier during a recent engagement. Trailed by a wake of flame and smoke, the twin-engined plane plunged toward the water narrowly missing the carrier as it careened out of control. Fighter planes, plus antiaircraft fire, broke up every Japanese air attack on the American task force.

SMOKE AND FLAMES TRAIL JAP PLANE AS IT PLUNGES SEAWARD

SILHOUETTE REVEALS PLANE IS A FRANCES, NEW JAP BOMBER



TOWERING GEYSER OF WATER MARKS THE FINAL RESTING PLACE OF RAIDER