NAVAL AVIATION NEWS

NATTC, 87th & Anthony
Jap-Nazi Dummy Targets
Beaching Navy Planes

Aug. 1, 1944

RESTRICTED

No. 5 of a series

Twice a Jap shot at me . . .

THE PILOT was fatally wounded by AA fire as he finished a glide-bombing run over Palau harbor, but managed to get the plane out of the harbor and past the reef. George Knapp, AOM1c, called to the belly gunner to get ready for a crash landing, and got the emergency bag ready. The plane struck the water at high speed.

"I don't know how I got out," Knapp said, "but the next thing I remember after the crash was finding myself in the water. My life jacket had been ruined, but the ration bag was floating around and I climbed on, got it between my knees.

"Then another plane dropped a raft that had been opened and partly inflated by mouth. I reached it with only a few strokes, climbed aboard, then used the inflation gear. That raft leaked some, but let me rest until I got strength enough to paddle to one of the other rafts and get it open. Then I got into the good raft and towed the damaged one.

"The shore was about 400 yards away and the wind was blowing toward it. Twice a Jap in a rowboat started out after me. Both times he got frightened and went back to shore, after getting five or six hundred feet away. I knew our planes had spotted me and figured they'd be back.

"After I had been in the water about four hours, two float planes from a cruiser came out and landed near me with their engines running. A Jap on shore shot at them with a rifle, and there was a Jap battery not so far away, but that didn't bother the pilots. Soon after one of them picked me up and took me back to the cruiser."

Aircrewmen
have what it takes!

DUMMY TARGETS

DUMMIES AND DECOYS are designed to confuse visual observers and bombardiers and to deceive photo interpreters. Some are hurried jobs, quite apparent when examined on photographs, while others are deliberate, carefully planned and executed. The greatest difficulties in the interpretation of decoys built by the enemy have come from the fact that we had no knowledge of the subject before the war, and the fact that there is no set of rules which the design and operation of these decoys follow. Each one is usually an individual approach to the problem at hand, and in each case the problem is apt to be solved in a different way.

In Europe, the Germans began constructing decoys and dummy positions as soon as they realized the countries they were occupying would be subjected to air attack, concentrating their decoy positions around their most important centers inside Germany's fortress.

EVIDENCE OF JAPANESE use of decoys has been on a much smaller scale to date, limited to installations such as gun positions, dummy planes, etc. The example pictured above, at Cape Gloucester, shows that the Japs had hoped to impress our forces with their strength by building dummy positions of logs, grass and rags.

Many other instances of decoy installations have been found in the Pacific area, built to tempt Allied airmen into wasting bombs. Careful interpretation of reconnaissance photographs counteracts this strategy.

JAPANESE DUMMY ANTIAIRCRAFT BATTERY AT CAPE GLOUCESTER, NEW GUINEA, MANNED WITH SCARECROW PERSONNEL MADE OF STRAW AND STICKS

DECOYS OFTEN ARE TOO OBVIOUS

DUMMY INSTALLATIONS frequently may be identified because of the tendency of the builders to make the subject too obvious, in their desire to attract attention. The Japs tried to pull a tricky stunt at Kiska. They set up a row of planes made out of lime, and very obviously dummy, along a spit of land which they planned to use for unloading supplies. The planes were intentionally made too bright and jagged in order to attract attention, on the theory that if we knew the planes were decoys we would not waste bombs on them and their supplies would be safe. The trick failed.

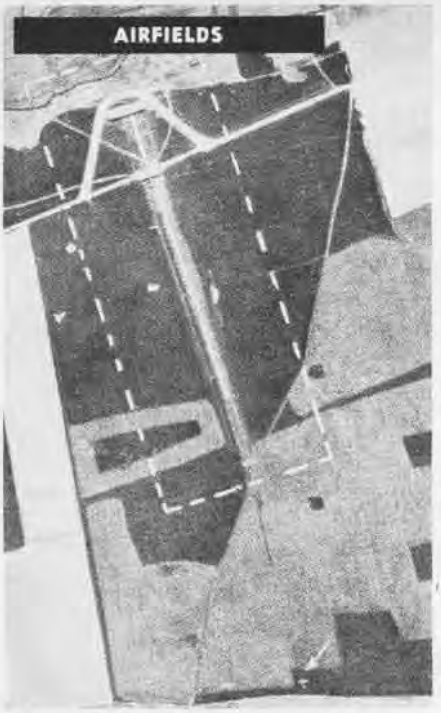
Photo interpreters have arrived at certain general conclusions in their study of decoys that help in their identification and location. Here are a few hints: signs of activity inherent in a real installation are lacking; white is too white; installations involving designs on the earth, such as roads or runways, are usually too angular with edges too well defined, while the opposite is true of objects designed to have depth; lack of shadows, or else shadows in wrong relation to objects; absence of communication to objects; absence of supporting objects such as an airfield with no signs of operating personnel living in the immediate vicinity.

DUMMY BUILDINGS, oil tanks and other such three-dimensional structures offer the best and simplest clues to decoy sites. Such constructions are almost always too conspicuous, and even though camouflaged, care is taken that they can be easily spotted from the air. Sometimes it is possible to spot movable dummy equipment such as planes by observing that they occupy identical positions in a series of photos taken over a period of time. A dummy plane built to resemble a T-96 heavy bomber at Lae, New Guinea, was recognized as such only after it was seen in the same position on several sorties and no attempts made to conceal it.

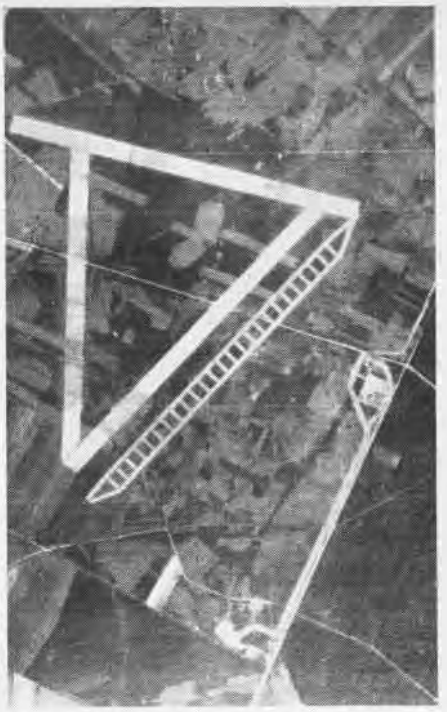
Dummy planes made by laying lime on the beach to proper size. Japs wanted to use this spit for landing supplies so made decoys obvious

Two dummy four-engine aircraft, simulating B-24's on Orote airfield, Guam, have no relief. They are probably painted or made of coral

AIRFIELDS



Dummy aircraft, rails and towing system form this decoy to simulate aircraft take off and landing. Decoy was used at night



Dummy aircraft are visible in front of hangars on this decoy airfield in Germany. Many such airfields were built in France

Dummy bushes constructed of netting on framework placed on roofs of hangars make these structures blend into the landscape

ENEMY USES MANY CLEVER TRICKS

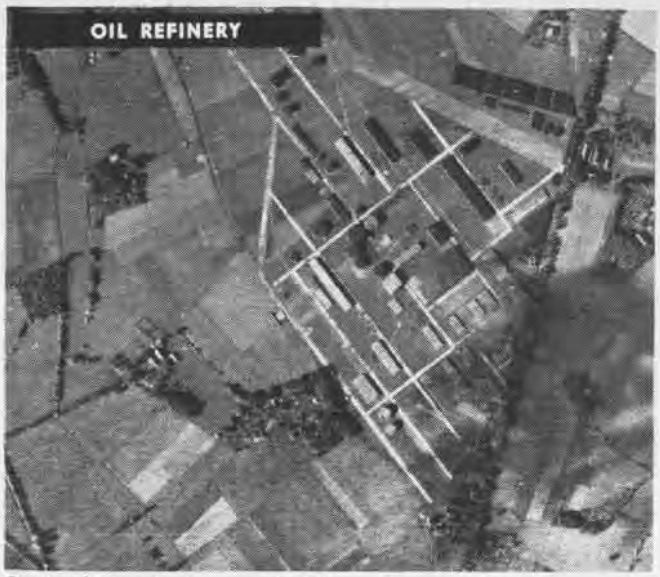
THE PHOTOGRAPH at the bottom of the page shows a very clever use of a decoy by the Japanese at Kiska. A damaged ship was beached in the harbor, and became a familiar landmark to pilots and interpreters. Then one day the Japs sneaked in with a sister ship loaded with valuable stores, put it in the location the damaged ship had occupied, and pulled the damaged ship out to a new position and surrounded it by a group of barges to give the impression of activity. They then proceeded to unload the new supply ship, and until interpreters recognized the damaged ship in its new location, the activity simulated around the ship drew bombs which should have been directed at the new ship.

There have been cases of *accidental* decoys, where native outrigger canoes have been mistaken for planes and bombed, or where some group of landmarks in the general vicinity of the target are enough like it to confuse the bombardier. Sometimes fires have been started by bombs dropped accidentally in remote areas on some barn or farmhouse, and these fires have often attracted bombs from other planes.

THE GERMANS have built a great many decoy airfields, especially in France. These are located in the vicinity of the airfields they simulate, which are sometimes camouflaged by painting the runways to look like surrounding fields and woods. These dummy airfields are outfitted with fake hangars with dummy aircraft parked on aprons in front, or sometimes scattered about the field. One example illustrated here shows a runway with rails and towing system to simulate an aircraft taking off or landing. This apparatus, complete with landing lights, is used after dark. Note the fake planes dispersed about the field. They are placed on dark patches of land and appear very white and conspicuous in photographs, characteristic of most dummies.

SHIPPING

BARGES TIED TO DAMAGED SHIP ATTRACT ATTENTION AND BOMBS WHILE NEW SUPPLY SHIP SLIPS INTO POSITION OF DAMAGED SHIP TO UNLOAD



German decoy oil refinery with elaborate layout of three-dimensional structures simulating real target. Photo shows lack of activity

Decoy for Antwerp-Kiel Oil Refinery situated one mile from target has tanks grouped like original. Across river is dummy church

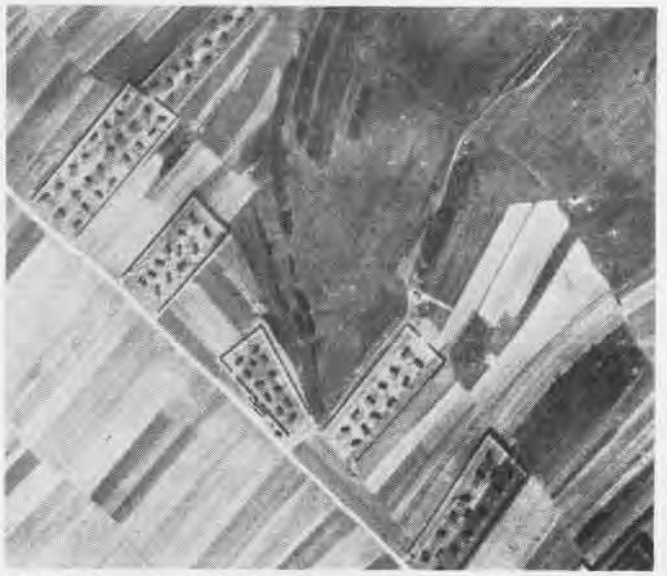
GENERAL AND PARTICULAR DECOYS ARE USED TO CONFUSE AIRCREWS

ONE OF THE MOST USED and most effective methods of attracting attention from the air and distracting bombs from a target is to set up a decoy fire, and this device has been used over and over again by the Germans, especially in night raids over industrial areas. There are a varied number of structures designed for this purpose, but they are usually in some form of a walled rectangle. In the center of these enclosures are piles of combustible material which can be set on fire, or else pits for burning liquid fuel. The rectangular walls keep the fires from spreading, and also create the illusion of a building on fire. Some of these installations even have windows in the walls to further the illusion. These walls tend to shoot the light in a vertical direction, making it less obvious that the fire is out in some field in an isolated location.

Various lighting systems also are used to deceive the pilot and bombardier in night raids over the Continent. Units with large shades designed to diffuse the light are arrayed in layouts to suggest industrial buildings, or parallel lines are painted on the ground and dimly lighted to suggest city streets or factories where they do not actually exist.

GENERAL DECOYS, such as fire-sites and walls, are those which are not associated with any specific target, but opposed to these are the *particular* decoys which represent in dummy form a specific individual target. If the decoy is designed to function during the daytime as well as at night, it is made as accurate and convincing as possible, either by copying the actual target as closely as possible if low level bombing is expected, or by a more general suggestion of the orientation and layout if high level bombing is anticipated. The actual target may be concealed as carefully as possible either by camouflage or smoke screens and the dummy located some distance away in the hope that it will attract the fire of planes which find the general location of the target. A well designed decoy which can persuade the pilot that he is over his target has served its purpose. They are naturally most successful in bad weather, when it is difficult to see clearly and pilots are searching for some landmark before dropping bombs on the target.

Decoy lighting system consists of parallel white lines painted or made of canvas, dimly lighted at night to suggest streets of town



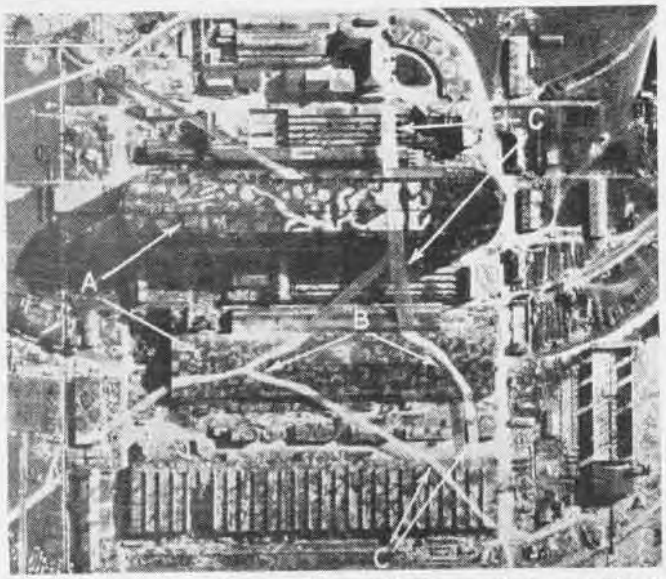
One of the largest fire sites built by Germans. Rectangular enclosures contain combustible material set fire to attract bombs

SMOKE ISSUES FROM DUMMY CHIMNEYS OF DECOY FACTORY AT WILHELMSHAVEN AS PORT IS ATTACKED BY BOMBERS. DECOY DREW NO BOMBS

GOOD BRIEFING ENDS DECEPTION

MANY OF THE GERMAN decoy sites have been extensive and elaborate. There are examples of dummy towns and ports, such as the Port Militaire at Lorient, where use was made of two very similar sites. Large scale buildings, docks, submarine slips and bridges were built to simulate the target site. There are other examples where important rail junctions or public buildings have been camouflaged and decoy targets built near by. One of the most familiar sites of this type is the Binnen Alster at Hamburg.

The distance of industrial decoys from actual targets varies from one to six miles, but averages about three. Usually, in the case of these targets, no effort is made to reproduce the landscape surrounding the target. The attacking planes are allowed to locate the target, but as they come back for the bombing run the decoy is put in action, and it will often detract fire from the actual target. Being located very near the target, decoys can be covered by the same defenses, antiaircraft, barrage balloons, etc., as the target itself. By giving the decoy AA protection, the enemy convinces the pilot that the position is an important one, and he may release his bombs over the false target, but the picture above illustrates that good weather and accurate briefing can nullify any decoys the enemy can construct.



Dummy roads and parks camouflage this German factory at Friedrichshafen to blend it with surroundings. Shadows spot buildings

Replica of important rail and road bridge at Hamburg constructed near actual target as decoy. Note area filled with dummy structures

HOBBIES TAME TAUT NERVES ON SARATOGA

TRAINED ATHLETES know that the man who can relax between innings or rounds is doing his nervous system a good turn and saving himself for crucial times ahead.

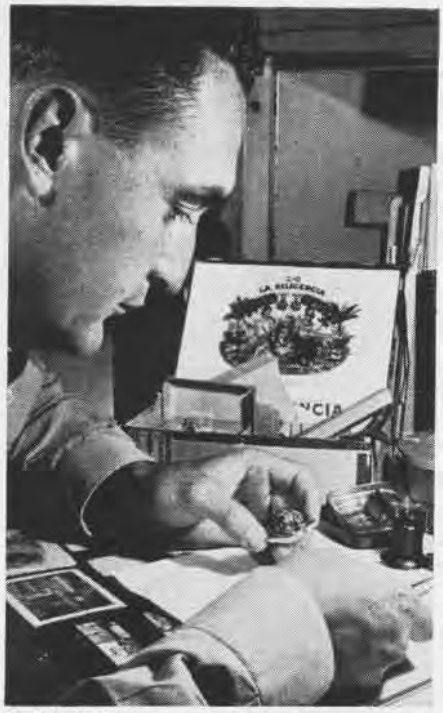
Like an athlete, a fighting man must be able to relax also to keep himself from being too high-strung when battle comes. On board a carrier, ways of relaxing are many, but a Navy photographer aboard the *Saratoga* recently found many officers and enlisted men pursue hobbies for relaxation.

Men with hobbies like golf or photography do not get much chance to indulge in them aboard ship, but those involving dexterity of hand are popular. The photographer found men who broke battle tension by carving leather pistol holsters, fixing watches and clocks, carving wooden images, painting photographs in oils, repairing typewriters, or collecting pipes.

Judging from reports received from the Fleet, doping-off on the carrier deck or at odd spots on the ship is a necessary pastime during hours of inactivity.

Wood carving is the hobby the flag intelligence officer of a task group pursues for relaxation when he is not organizing targets to be bombed or getting data for strikes

One of Saratoga's most popular men is this storekeeper who can repair almost anything



Assistant damage control officer repairs watches, clocks free during his off-hours

Leather work, wood carving, knot tying are pastimes of chief parachute rigger

GRAMPAW PETTIBONE

Learn and Live

Aircraft accidents cannot be avoided unless pilots are familiar with all pertinent operating instructions and safety warnings.

Accident reports indicate some pilots are unaware of the information contained in Technical Orders and Notes and Flight Safety Bulletins which have been issued with the directive, To BE READ BY ALL PILOTS.

One of the simplest methods of insuring that these publications are made available and read is to place them on conveniently located file boards and to establish the "read and initial" system. The system should be policed periodically and pressure applied where necessary to make it work.

Storm Warning

A formation of six fighters took off on a navigational flight. They encountered a local storm front just short of their destination. The flight leader (1,300 hours) and his two wingmen went into the storm at 1,500 feet; the second section veered off. The leader and one of his wingmen crashed, out of control, shortly after entering the front. The third plane was thrown violently on its back, but the pilot was able to regain control and get through on instruments.

Grampaw Pettibone says:

Certainly every naval aviator has been adequately warned in Naval Aviation News, as well as through lectures, technical notes and aerological pamphlets, to stay out of storm fronts unless absolutely necessary.

Too often aviators are like small boys; it is hard for them to take warnings seriously. They are skeptical and have to try it out for themselves. In flying, however, this hard-earned knowledge often comes too late to do an aviator any good. That's why he has *got* to learn from the sad experience of others.

Loose Cargo

Prior to being catapulted in a TBF, the pilot checked his controls and found them free. Immediately after launching, the stick jammed in the back position and could not be pushed forward, nor could the effect of the up flippers be neutralized with the elevator tab. The

plane stalled and hit the water in a nose-dive attitude. The pilot and mechanic got free, but the passenger sank with the plane.

Owing to the fact that the airplane was lost, it was impossible to determine the exact cause of the accident, but it was the opinion of the Trouble Board that the mail sacks which were being carried in the second cockpit had jammed the elevator bell-crank. The Board recommended that no cargo be carried in the second cockpit unless a suitable cover is installed over controls.

▸*COMMENT:* A "suitable" cover, as referred to by the Trouble Board would have to be made of metal. This is considered impracticable. The present cover is entirely satisfactory for its intended purpose—to keep dust out of the controls. A much simpler solution, when mail or cargo is carried in this airplane, is to lash it securely in the bomb or tunnel compartment.

Probably a "Graveyard Spiral"

Taking off shortly before daylight, an R4D-5 climbed to approximately 500 feet, then nosed into a gliding spiral and crashed. When questioned later, the surviving co-pilot stated there was no material failure, as far as he knew. He said the plane commander made a normal turn to the right at 509 feet and then the aircraft lost altitude at increasing speed until it crashed. The investigating board held that the pilot neglected to go on instruments when he encountered conditions unfavorable for contact flying.

Grampaw Pettibone says:

This pilot has 4,000 hours flight experience.

Here is proof, if you still need it, that you can't fly by the seat of your pants in instrument weather. Your senses will play you false unless you have a visible reference.

Review Chapter 13 of *Instrument Flight*, part one, and make up your mind always to go on instruments before visual references are entirely blotted out, while you still have time to get set.

Who Held the Bag?

While taxiing into the line after a landing, an FG-1 pilot experienced brake trouble and was not able to maintain directional control. He called the tower and was told to cut the engine and stand by. While waiting for assistance the pilot remained in the cockpit and, in his own words, "stood up so that other planes could see me." A few minutes later an F6F came barreling down the taxi strip and apparently didn't see the FG, nor its pilot, in time to avert a collision. The FG was completely destroyed, with the pilot barely managing to scramble out of the cockpit in time to save himself.

Grampaw Pettibone says:

Let's see who was to blame. *First*, the tower for not warning the F6F pilot about the stalled plane on the runway. *Second*, the F6F pilot, for not observing safe taxi procedure. *Last*, but not least, the FG pilot himself. He should have humped himself out of his plane and gone to the side of the runway, ready to flag down any approaching plane—using his skivvies, if necessary. Expenses for replacement planes and for military funerals would be considerably reduced if this procedure were followed whenever an airplane stalled on an airfield runway, the taxi strip or line.

The Mechanical Age

An FM pilot was thirty miles from his home station when his propeller went into high pitch. He attempted both automatic and manual adjustment, but was unsuccessful. He decided to return to the field at 1450 rpm. His landing approach was high and close

behind another plane. Upon being given a red light, he attempted to circle the field. He could not maintain altitude with wheels and flaps down, however, and mushed into some trees. The airplane was completely demolished and the pilot received serious injuries, including a fractured skull.

▶*COMMENT*—A lot of money is being spent annually to equip planes so that pilots can cope with situations of this sort. Unless pilots understand the mechanics of these safeguards, however, there is little use in providing them.

A review of the mistakes made by this pilot should benefit others who may experience a similar emergency:

In the first place, the symptoms reported indicate the trouble might have been an open circuit breaker. There was no indication that the pilot checked this point.

Secondly, the pilot failed to notify the tower of his emergency and the necessity for a high approach. Had he done so, the field would have been placed in positive control and a safe landing could have been made. Not having done this, he should have checked more carefully to insure no possible interference from other planes on his initial approach.

The second mistake led to the third which involved wheels and flaps. These should not have been lowered (particularly the flaps) until the pilot was definitely committed to a landing. Also, he should have raised his wheels and flaps as soon as he started to circle the field again. This airplane will climb in full high pitch below 5,000 feet when wheels and flaps are retracted.

Untrained Reactions

On his fifth take-off during touch-and-go landing practice, a TBF pilot (288 hours) claimed that the engine twice failed to catch. His plane rolled off the end of the runway into sand where it nosed over.

The Trouble Board said: "It is considered that the pilot erred in several respects. The plane operated normally for 40 minutes previous to the engine failure claimed by the pilot. After his last landing he spilled his flaps—according to instructions—and opened cowl flaps. By this time, at least half of the runway had been used. It is believed that the pilot then jammed his throttle on too quickly, causing the engine to cut out momentarily. With very little runway left, he undoubtedly advanced the throttle quickly again. The engine failed to catch the second time and it was then too late to stop the aircraft from rolling off the end of the runway.

"The pilot, when engine failed to develop power the first time, had sufficient runway remaining to stop the plane safely. He certainly should not have tried to get airborne the second time. Had he exercised good judgment he would have returned to take-off position and checked the engine thoroughly on the ground before attempting another take-off.

"Another thing, the pilot used brakes to stop his plane after running off into the soft sand. Standard instructions in this unit are to keep feet off brakes as soon as a plane leaves the runway. In every instance that the stick has been held back and no brakes used, planes have not nosed up or overturned."

Grampaw Pettibone says:

You have got to visualize your emergencies ahead of time and *know* the right answers. Unless you do, your split-second decisions and reactions in emergencies will often be wrong.

Ground Towing Technique

A recent tail wheel failure in an F4U-1 was determined to have occurred as the result of the airplane having been towed by the tail with the tail wheel in a locked position.

The contractor recommended that all units concerned with the F4U-1 be cautioned to disengage the tail wheel locking pin before towing the airplane.

▶*COMMENT*—This caution applies to all airplanes equipped with lockable tail wheel installations. Airplanes equipped with steerable type tail wheels present special towing problems. Ground towing crews must be familiar with the latest towing instructions as contained in erection and maintenance manuals, airplane bulletins.

Wounded by Hang Fire Shot

A pilot-gunner had fired 50-caliber armor piercing ammunition from a FMB deck turret during two runs while on a gunnery training hop. When the towplane approached again, he elevated the barrel and pressed the trigger twice. The gun did not fire. As he brought it back to the normal position, the gun went off. The bullet seriously wounded another officer in tail turret.

▶*COMMENT*—Both hang fires and "cook-off" shots are recognized as a source of just such dangers. That is why all gunners are told to keep a hot gun pointed away from any object which might be damaged until it is ascertained by repeated charging action that the gun barrel is cleared. This accident can be attributed to failure to follow prescribed safety precautions in event of stoppage.

Engine Test on Carriers

Aboard a carrier, a plane captain started the engine of a fighter plane for a full-power run-up test under supervision of the flight deck engineering officer. While the engine was in high speed operation, the tail securing lines parted and the chocks skidded, allowing the airplane to crash head on into another plane undergoing similar test.

The propellers chewed up both planes and started a fire which burned for five minutes when one of the droppable tanks was ripped open. Two mechanics were injured by flying parts.

Due to the tremendous power developed by modern service engines, this carrier now requires, in addition to all other safety precautions, that a qualified pilot be at the controls for all full-power turn-up tests.

Lock Your Shoulder Harness

Power loss on take-off caused an SB2C pilot to make a forced landing in an uncleared area about 300 yards beyond the end of the runway. The airplane bounced when it hit and, upon contacting the ground again, turned over. The pilot received a frontal skull fracture which resulted in his death.

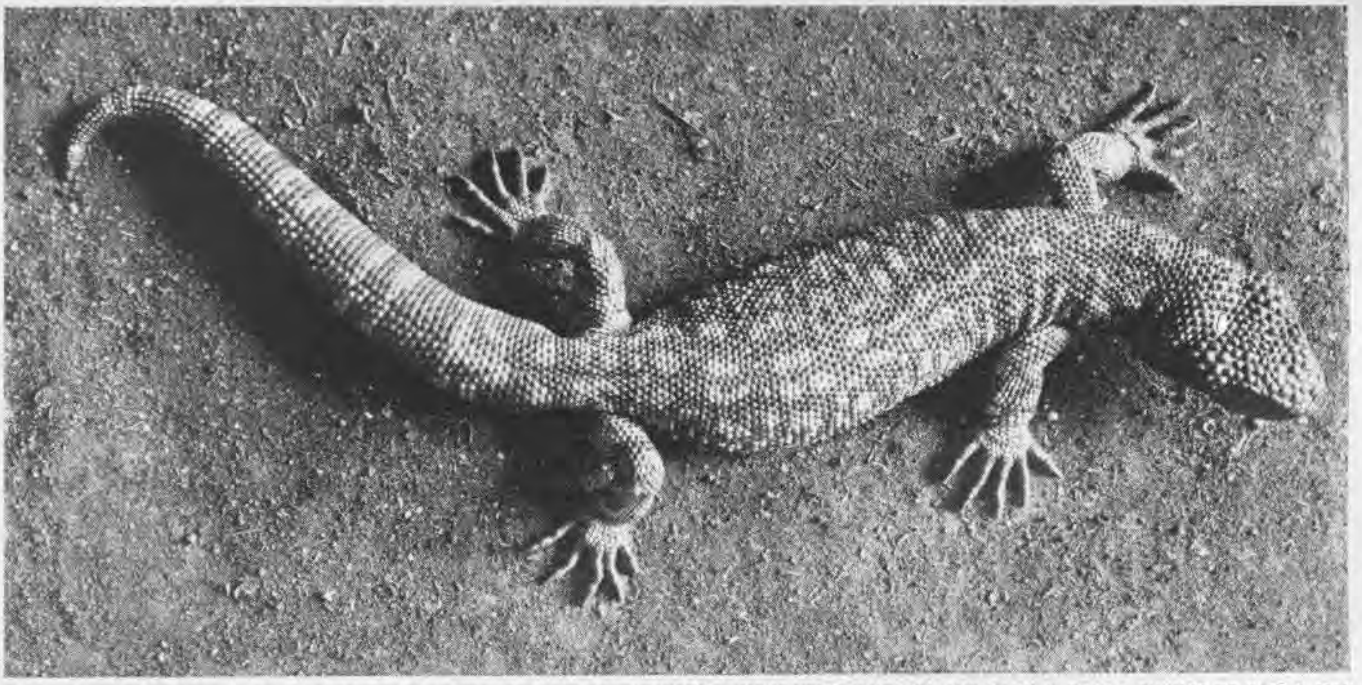
The commanding officer made the following statement in his administrative report on this accident:

"It is believed that had the shoulder straps been locked and not just riding on the bungee cord, the injuries to this pilot would not have been fatal."

Grampaw Pettibone says:

The shoulder harness was designed to prevent just this type of injury. It has been credited with saving hundreds of lives since it has been put in use, but it can't help unless you give it a chance.

The naval aviators who are striking out at the enemy today were the cadets of yesterday. They are always willing to learn and are quick to profit from the mistakes of others



THE MEXICAN BEADED LIZARD IS ONE OF TWO POISONOUS LIZARDS IN THE WORLD. HE IS VERY SLUGGISH AND RARELY GETS A CHANCE TO BITE A MAN

NATURAL HAZARDS

Simple Precautions Reduce the Danger of Poisonous Snakes

FEAR OF SNAKES is out of all proportion to the dangers. Common sense dictates respect for the poisonous varieties, but cases of poisonous snake bite are relatively rare. Of the 2,400 kinds of snakes in the world, only 200 are dangerous. Only in Australia do the poisonous kinds outnumber the harmless ones. Areas entirely free of poisonous land snakes include Madagascar, New Zealand, the Polynesian Islands, Cuba, Jamaica, Haiti, Puerto Rico, the Azores, the Canary and Cape Verde Islands and Hawaii.

Snakes cannot stand extremes of heat or cold. In temperate regions they are active during the warmer months but hibernate or become inactive in cold weather. In desert regions they lie in shade during the heat of the day.

Most poisonous snakes are timid and will avoid you if given the chance. The majority of bites are by snakes suddenly surprised or stepped on. Snakes with few exceptions move slowly, though many can strike very rapidly. They cannot outrun a man, and only a few can leap entirely off the ground or strike as far as their own length. A sharp blow with a stick will break the back of any of the average sized snakes.

If you take a few normal precautions you can forget about fear of snakes. General rules are:

1. Keep alert, particularly when climbing steep, rocky slopes.
2. Never tease or pick up a strange snake in a strange country.
3. Protect vulnerable parts of your body, particularly the feet and legs. Even light clothing is protection against many varieties of snakes.
4. Many snakes roam at night; cut down on any night travel when in snake country.

SURVIVAL HINTS—NO. 14

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

5. Learn the distribution and habits of poisonous snakes in any area to which you may be assigned.

Poisonous long-fanged snakes include the true vipers and the pit vipers. Most of them are thick-bodied with a flattened head. Many have keeled scales that give them a dull appearance as compared with the satiny smooth-scaled snakes. The pit vipers include all the dangerous poisonous snakes of North America except the coral snake. They inhabit both hemispheres, but the most numerous and largest species are in the New World. All have a deep pit between the eyes and nostril, but it is not easy to see features even at close range.

THIS FAMILY includes the various species of rattlesnake, all dangerous and all confined to the New World. The water moccasin is semi-aquatic, inhabiting sluggish waters of the southern United States. The copperhead is common in the eastern United States. Other pit vipers are the bushmasters of central and tropical South America; the arboreal palm vipers of Mexico, Central and South America (which frequently inhabit low trees, bushes, palm and banana trees) and the bamboo snakes of Asia.

True vipers are thick-bodied snakes found only in the Old World; in Europe, India and in Africa. Well knowr kinds include the Russel's viper of India, the puff adder of dry areas of Africa and Arabia and the gaboon viper and cape viper of tropical Africa.

QUICK TREATMENT SAVES VICTIMS OF SNAKE BITE

THE ELAPINE SNAKES (including the cobras, kraits and American coral snakes) are among the most deadly poisonous snakes, but even light clothing is a fairly good protection against them because of their short fangs. They comprise the majority of snakes in Australia and many species are found in India, Malaya, Africa and New Guinea.

There are ten or more species of cobras, all confined to the Old World and all more or less able to spread the neck to form a "hood." The king cobra is the largest of all poisonous snakes. The Australian blacksnake, the tiger snake and the death adder are among the most deadly and abundant of Australian elapine snakes. Coral snakes are small, brilliantly colored snakes confined to the New World.

Boas and pythons are not poisonous, are slow moving and rarely attack men unless molested. They are dangerous if disturbed because of their sharp teeth and power of constriction. The large species live only in dense jungle in Burma, Indo-China, South America and central and Southern Africa. Species such as the regal python and anaconda average between 17 and 22 feet in length.

There are only two poisonous lizards in the world, the gila monster of the American southwest and the beaded lizard of Mexico and Central America. Both are found only in desert areas. They are so sluggish and their mechanism for injecting poison is so poor that lizard bite is extremely rare.

QUICK and intelligent treatment is the most important factor in reducing the danger from snake bite.

1. Make a lengthwise cut through each fang puncture as deep as the puncture. Make additional shallow cuts near the wound to drain it. Cut parallel to blood vessels and tendons. Prompt incision will reduce a deadly to a non-deadly dose.

2. Squeeze out the blood and venom and suck it out if your mouth and lips are free from cuts. It won't hurt you unless it gets into the blood stream through a cut.

3. If a limb has been bitten, place a tourniquet between the wound and the heart. Loosen the tourniquet briefly every 20 minutes.

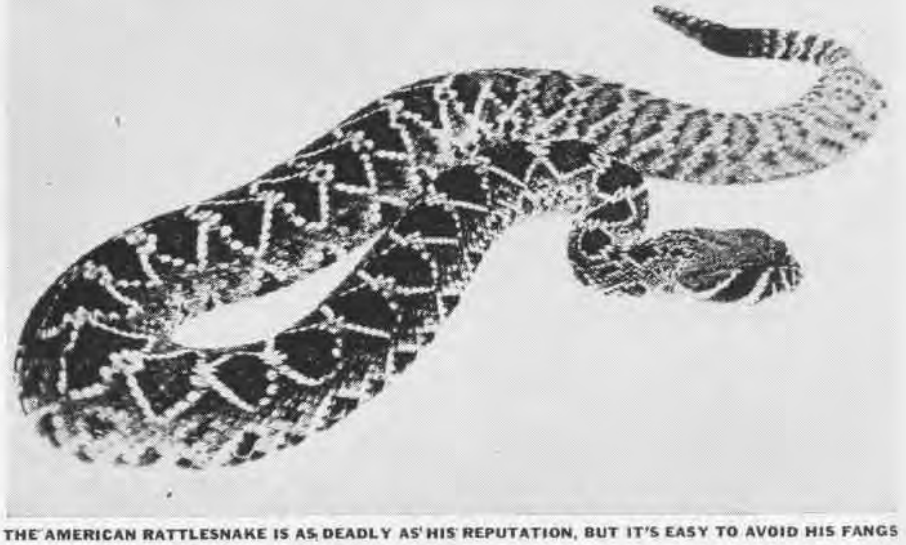
4. Keep quiet. Exercise increases the speed of spreading of the venom. Avoid all stimulants.

5. Cooling with a wet cloth or ice will delay the absorption of poison.

6. Kill the snake for identification if there is any chance of getting serum.

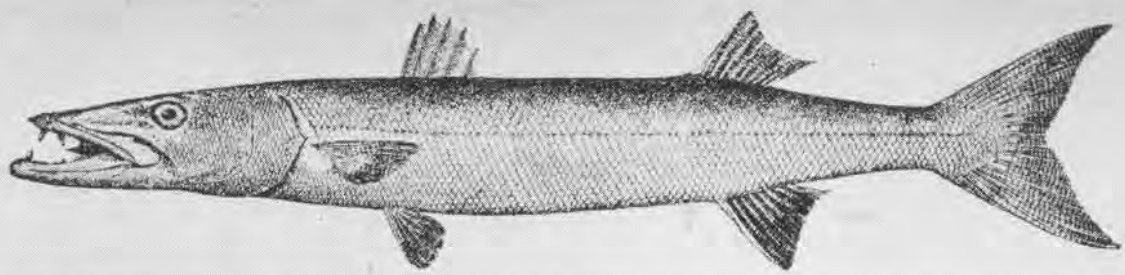
7. Don't cauterize the wound. The burning action does more harm than good.

THE GABOON VIPER HAILS FROM TROPICAL AFRICA. IT IS WISE TO LEAVE VIPERS STRICTLY ALONE



THE AMERICAN RATTLESNAKE IS AS DEADLY AS HIS REPUTATION, BUT IT'S EASY TO AVOID HIS FANGS

FAMED IN FACT AND FICTION AS A LETHAL FELLOW, THE SINUOUS COBRA HAS MANY RELATIVES



THE BARRACUDA HAS A MEAN REPUTATION, BUT HE'S NOT AS DANGEROUS AS THE STORIES SAY. HE PLAYS AROUND NEAR THE CORAL REEFS AND SHOALS

SHARKS, JELLYFISH, CROCODILES AND CARIBES PROVIDE NUMEROUS HAZARDS FOR THE UNWARY

The danger of being attacked by a shark or barracuda has been greatly exaggerated. They are timid, wary creatures. Sharks are curious and will investigate any object in the water, but they are likely to attack only the dead or wounded and bleeding. Any flow of blood should be stanched as quickly as possible. Stay with your companions; groups are less subject to attack than lone individuals. Barracuda are more dangerous in murky water than in clear water. They are usually encountered in shallow water, often along coral reefs. They are seldom met in the open sea.

Jelly fish and Portuguese men-of-war have long tentacles that produce painful stings and severe swellings which may last for hours. The greatest danger from the stings is that they may cause a swimmer to develop cramps or become panicky. Clothing should be worn as a protection while swimming in areas where these animals are numerous, and objects on the surface resembling large bubbles should be avoided. If stung, make every effort to relax. Prompt application of ammonia will relieve the pain.

Stingrays are flat fish with a powerful, venomous tail stinger that can be driven through a man's foot, leaving a wound likely to become infected. They frequent sandy or mud bottoms and may grow to several hundred pounds. You can avoid stepping on them by shoving your feet through the sand or by poking ahead of you with a stick to frighten them out of your path. The sting of a large stingray may be fatal.

SEA ANEMONE

PORTUGUESE MAN-OF-WAR

The stone or scorpion fishes of the Pacific ocean and some of the toad fishes of tropical America are the most dangerous of poisonous fishes. Their spines may produce a sting which causes severe pain and swelling followed by prostration. Treat a sting as you would snake bite. These fish are apt to be encountered among coral head where the unwary may step on them or touch them with the hands. Some of the sea anemones also may sting. They are small, plant-like creatures which cling to rocks and on reefs in tidal pools.

The crocodilians are confined to marshy lowlands, sloughs, rivers, the coasts in the tropics and semitropics. A blow from the powerful tail of one is a more real danger than the possibility of being bitten.

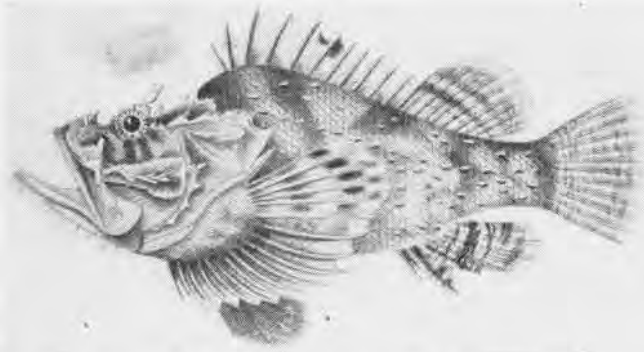
Only four fresh water fish are dangerous to man and all four are found in tropical South America. They are the caribe, the electric eel, the candiru and the stingray.

The caribes (also known as piranhas or pirayas) are the most feared of this group. They inhabit the Paraguay, Amazon and Orinoco river systems, are generally found in schools and go wild if they encounter blood in the water. They are about the size of a large sunfish and have deep blunt heads and powerful jaws armed with cutting teeth. They may attack any animal entering the water. People wading or swimming have been killed by schools of these little fish. They live in smooth water, never in rapids. Clothing will protect against them.

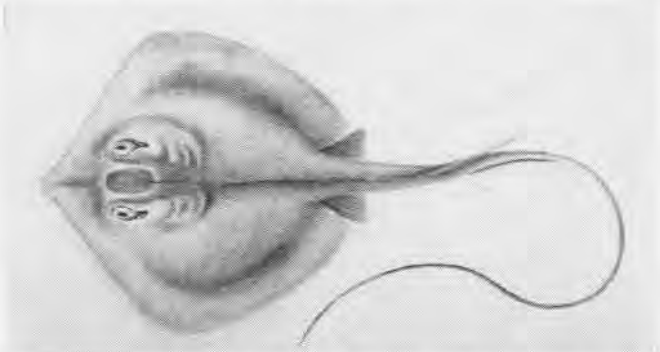
Fresh water stingrays are abundant in the muddy and sandy areas of South American streams. Take the same precautions as against marine stingrays.

The candiru is a tiny fish found in the Amazon and Orinoco river systems. Cases have been reported of this small fish swimming into the urethra of an individual urinating in the water. Small, hook-like spines prevent it from getting out again.

The electric eel of the Orinoco and Amazon river systems delivers the most powerful shock of any fish. Fortunately it is seldom encountered by man.



SCORPION FISH, ONE OF MOST DANGEROUS, IS POISONOUS TO TOUCH



STINGRAY PACKS A REAL WALLOP IN THAT POWERFUL TAIL STINGER

POISONOUS PLANTS

PLANTS poisonous to touch are often troublesome. Contact with them may cause severe eruptions, swelling, inflammations. They are particularly dangerous in the vicinity of the eyes. The danger of being affected is greater when you are hot and sweaty. Don't use the wood of these plants for a fire. Avoid contact with the juices of all unfamiliar trees, and take particular care not to get these milky juices in the eyes.

POISON IVY is one of the most troublesome of the plants that are poisonous to touch. Most people have run into it at one time or another. The itching is annoying and if it spreads much it can cause misery.

POISON OAK is another common plant in America that is poisonous to touch. Symptoms of being poisoned are similar to those of poison ivy. It is worth considerable effort to stay away from all these plants.

LIGA, a small shrub of the group of Rengas trees of India, Malaya and the South Pacific islands, causes severe skin eruption. It can be identified by the black sap along the trunk. Many Rengas are forest trees.

POISON SUMACH, the third plant in the major trio of poisonous plants in the U.S., grows only in wet swampy areas. Avoid it like the poison it is. As with other poisonous plants, it is best to wash with soap.

BLACK POISON WOOD grows in Central America and the West Indies. It belongs to the same family as poison ivy and poison oak. (Notice similarity of leaves and berries.) It causes similar skin eruptions.

BEACH APPLE or manzanillo is found in Central and tropical South America, the West Indies and Mexico. The sap may cause blindness if it gets in the eyes. Immediate bathing in sea counteracts this.

WHITE MANGROVE, "blind eye," found in India, Australia and the South Pacific islands, grows in swamps and salt marshes. It is a shrub or small tree whose white sap causes skin irritations and even blindness.

MONKEY PISTOL or sandbox tree of tropical America, Panama and the West Indies is a large tree with spiny trunk. The sap is very irritating and may cause temporary blindness. The small fruit is poisonous.

SAPIUM, a genus of plants found in the tropics of both hemispheres, causes serious skin inflammations. It is the milky juice of this plant that causes all the trouble. If it gets in the eyes, wash them with milk.

STINGING NETTLES produce a burning sensation when touched, followed by red welts on the skin. They are usually not dangerous, but they are a nuisance and cause discomfort. The sting does not last very long.

JATROPHA URENS is another stinging plant. It is not uncommon in tropical America. Stay away from it if possible. If you do run into it you will simply have to grin and bear it. Poisons add to hardships.

STUDENTS ROTATE AS PILOT, NAVIGATOR, RADIO OPERATOR, CONTROL DESK OPERATOR AND DESK TERRAIN AND ASTRO OPERATOR DURING COURSE

Waves Study For Jobs On Link Program

THE FIRST all-WAVE class to attend Naval Training School (Link Celestial Navigation Trainer) at NAS Seattle was launched recently with 35 WAVE Link trainer operators chosen from all sections of the country attending.

Although these WAVES are pioneers in the course given by Naval Air Technical Training Command, first experiment to determine adaptability of women to the job was done with three WAVE Link operators from NAS Seattle. No more men will be given the course at the two Link Celestial schools at Seattle and NAS Quonset Point.

WAVES graduating from the schools will serve as assistants to assigned officer instructors at various Link Celestial installations throughout the country.

The course is of 10-weeks duration and includes flight theory, instruments, aerodynamic principles, electricity, radio, general mechanics, radio voice communication, celestial navigation theory, dead reckoning navigation, radio navigation and Link trainer operation.

Celestial Link Trainers have "crabs" the same as ordinary Link machines. Here control desk operators supervise "night flight"

Celestial theory instruction is given through three-dimensional demonstrator constructed by school to help visualize universe

SHORE STATIONS

▶NAS NEW YORK—A young naval lieutenant, doing shore duty in New York, had become quite friendly with his yeoman, such as sending him out for coffee and sandwiches, etc., while working late nights, and relying on the enlisted man to keep his personal effects in shape.

One day the lieutenant noticed his yeoman was looking a bit down in the mouth. "What's troubling you?" he asked. "You seem to be pretty low."

"I am, sir," replied the yeoman. "We had bad news today. We heard that my wife's yacht was sunk on anti-sub patrol."

▶MCAS MOJAVE—A Marine captain was slightly startled recently when he received a mailed notice from his draft board solemnly advising him that he had been classified 1-A.

The captain who is 41, married, the father of two children and has been a Marine officer since August 1942, didn't bat an eye. He rushed into the office of the commanding officer and gravely requested an emergency leave so he might apply for deferment in view of his employment in an essential industry.

▶MCAD MIRAMAR—What does a pilot think of first in those critical seconds after his plane is forced down in the South Pacific, miles from nowhere?

A radioman-gunner of a dive bomber who has just returned from combat zones tells this one on his pilot. A broken oil line had forced their plane down after a raid on Rabaul. The sergeant lost no time breaking out the life raft and getting clear. Seconds before the plane sank, he looked around to see how the captain was doing.

"There was my pilot climbing out of the plane with his plotting board in one hand and a box of candy in the other!"

▶NAS SEATTLE—The *Stethoscope*, a naval hospital newspaper, offered a prize to anyone who could identify Betty Grable's leg in a layout of art pictures. The chaplain won.

▶MCAS EL TORO—During the past six months, the Buildings and Grounds department has accomplished a tremendous planting program with very little cost to the government. Items already planted include 3,350 shrubs, 3,750 square feet of flower beds, 900 trees, 430 acres set to permanent sod, and the establishment of a small nursery.

The trees were donated by a local nursery as they were over the usual planting age; however, even under these adverse conditions, the loss was less than 15 percent. The shrubs and flowers were acquired by trading empty tin cans to other nurserymen. In addition, 532 acres are planted to barley and 74 acres to flax under an arrangement with a nearby ranch.

The planting program at El Toro is more than a beautification project, for the soil must be stabilized as much as possible to avoid damage to airplanes from dust during the local Santa Ana winds.

▶NAAS GREEN COVE SPRINGS—A seaman second, new to the Navy and very confused by it all, looked over the shoulder of a petty officer studying a batch of papers in the administration building. The newcomer was puzzled when he saw the cryptic symbol: "CNAOpTra."

"What's that?" he asked.

"Cinatra," replied the petty officer, employing the usual phoneticism for the cluster of letters indicating Chief of Naval Air Operational Training.

The seaman was interested. "What's he?"

"Why, that's the admiral," said the PO.

"Admiral, eh?" The sailor gasped in wonderment. "Well, whaddya know? Frank Sinatra's an admiral! Say, that crooner really has something on the ball."

▶NAS PEARL HARBOR—Ticking placidly on, despite her rendezvous with destiny, *Punchy*, A&R's popular time-clock, stands as an hourly reminder that time will be stayed by no bomb. *Punchy*, an eight-day wonder that is wound by hand, is being boosted for a niche in the Smithsonian Institution. She was ticking and clanging happily the morning of December 7, 1941 when the Japs dropped down. Evidently she stood high on the Nip *must* list. They plopped a heavy bomb directly in front of Building No. 2 where *Punchy* is moored. When the smoke cleared away the clock was the only thing left under power. *Punchy* is still going, though there is a difference of opinion about the beauty of her face.

▶NATC PENSACOLA—Paying tribute to naval "authorities who have shown great wisdom in providing music facilities" for the men in the armed forces, Sir Thomas Beecham demonstrated that some of the world's finest music is being played in the military services when he conducted the NATC symphonic band in a recent concert at this station. Sir Thomas, a world famous conductor, said that the training center's symphonic organization was "damned good." He went on to state that the band had "learned the priceless virtue of saving time," and that the discipline of the musicians at rehearsals made it possible to accomplish a great deal more than is generally possible with symphonic groups.

▶NAS FT. LAUDERDALE—Jeeber, mascot of the Marine detachment at this station, learned about Florida varmints the hard way. In typical dog fashion, he at first obeyed his natural instincts, attacking his own direct method. This was to charge furiously and frantically, emitting loud barks and attempting to chew them up with his teeth. This worked well enough until one night when one of those pincher-equipped Broward County "dragons" closed its needle shaped hooks on Jeeber's tender snout.

From that day to this, Jeeber has employed a new technique. Now he sneaks up quietly on his adversary and flattens him completely and permanently by a downward blow with his oversized paw. After Jeeber has hammered a bug down with his eight-ounce boxing glove, the critter doesn't even quiver. Every morning at dawn, a burial detail of Marines takes away the corpses of hundreds of dead varmints who probably didn't know what hit them.

▶NAS BUNKER HILL—Several N2S-T planes at this station have been repainted with broad (14") blue and white stripes, symbolic of the recall flag, for greater range of signaling to cadet pilots. The recall planes have proved very satisfactory and answer a definite need in guiding cadet pilots when bad weather is brewing.

▶MCAS SANTA BARBARA—One of the air groups at this station inaugurated, as part of its training for duty overseas, realistic instruction in water landings by parachute and the handling of the rubber life raft.

The training operation is conducted at the end of the station pier. A special device drops the fliers 25 feet to the water where, under the watchful eyes of combat-seasoned experts, they release themselves from their parachutes, hit the water, inflate their life rafts and climb aboard.

▶MCAS EL CENTRO—With the formation of a WR orchestra on the station, the hep-cats and alligators are anticipating its first appearance when they can get in the groove. This is the first WR orchestra to be organized on the West Coast.

▶NAS LAKEHURST—The Fifth War Loan Drive opened with the sale of a $100 bond to a parachute rigger second class who was a soldier in the German Army during World War I. The sailor came to this country in 1927 and was naturalized in 1932. He remarked, "I owe my life to this great country, and I shall be willing to sacrifice it to preserve our way of life."

▶NAS JACKSONVILLE—During one month at this station, Ship's Service sold 444,000 bottles of Coca-Cola. If all bottles were laid end to end, they would stretch for 56 miles or 3,552,000 inches to be exact. If all the nickels inserted in the vending machines were stacked, they would pile up over a half mile high or 3,055 feet. If you collected all the five-cent pieces spent for Cokes, you would have enough to buy baby a new pair of shoes and have a little change to spare—$22,200 to be specific. Must be hot in Jax!

▶NAS HUTCHINSON—Every WAVE who appeared in the revue, "What's the Word?" during its recent production in Hutchinson, contributed $25.06 to the Red Cross fund. The sell-out house poured $1,514.50 into the box office. This figures $25.06 for each of the 50 WAVES who participated in the revue. There were no expenses. Everything was donated, from use of the hall to services of the union stagehands.

▶BLIMPRON 15—A popular part of this squadron's ground school program is checking out combat aircrewmen in the use of flotation gear. The Coast Guard has kindly furnished a mercy boat to take individual crews out in St. Simon's Sound. The crews are fully clothed and fitted out with standard lifesaving gear. At a given signal the boat is allowed to drift like an airship in the water and the order "Abandon ship" is given. All hands are required to go overboard in order, to gather in a circle when clear of the boat and to inflate the raft and climb aboard according to the book. A watch is posted and a course, which they are required to row for a distance of two miles, is set. So far there have been no casualties. However, there have been some complaints that emergency rations are not provided. Altogether, the O-in-C of the program is well pleased. It is reported that he has had fresh shrimp for dinner every night since the drill started.

▶NAS OTTUMWA—The Ship's Service experiment at this station to increase the number of nickels in circulation by giving no dimes in change has resulted in a 25 percent increase in the sale of bottle Coca-Cola through vending machines.

▶NAS DALLAS—Two aerographers at this station put their theodolite to a new use the other day when a plane crashed on the field after losing a wing during a test hop. The men had just completed a pibal run when the plane crashed into the drill hall about 100 yards away. Guessing correctly that the pilot had bailed out, the aerographers swung the theodolite through the sky, picked up the unfortunate pilot in the eyepiece and followed him down into a small field a few miles north of the station. Onlookers say aerology gave an exciting swing by swing report of the pilot's descent.

TOKYO TALKS

—TO SOUTH PACIFIC AREAS

A German exhibit in Tokyo depicting 300 years of development in the German armed forces is receiving considerable "admiration" in the capital. The Japan-Germany Cultural Institute is the sponsor.

—TO JAPANESE AREAS

Etsuzo Kurihara, chief of the naval press section of Japanese Imperial Headquarters, issued a formal warning not long ago telling the Japanese people that the "battle situation in the Saipan areas is the most critical one since the beginning of the war." Pointing out that Saipan "is located at a point 1,268 nautical miles from Tokyo and 1,500 nautical miles from the Philippines," Kurihara said: "Therefore, if the enemy succeeds in building a powerful air base here, the influence on our sea and air supremacy in the western Pacific will be extremely great. If the enemy uses large type bombers, the homeland of Japan and the Philippines will be exposed to bombing by enemy planes."

SHOW ME THE WAY TO GO HOME

Sector Search

You, as a navigator of a patrol plane, depart Buin (Bougainville Island), Lat. 06°48′ S, Long. 155° 45′ E at 0530 to search a geographic sector from 250° to 300° to a maximum distance, returning 0800 to the U.S.S. *Saratoga* which at 0700 will be at Lat. 08°10′ S, Long. 156°20′ E, on course 264°, speed 26 k. You are to fly at 10,000 feet, CAS 125 k. Air temperature (−) 3° C. Wind is from 160°, force 28 k. Visibility 24 miles. Mean variation 7° E.

1. What is the course and speed of the fictitious ship? Cus ..... Speed .....

2. What is the magnetic heading, 1st leg of search? .....

3. What is the magnetic heading, 2nd leg of search? .....

4. What is the magnetic heading, 3rd leg of search? .....

5. What is the time to turn at the end of the 1st leg of search? .....

6. What is the time to turn at the end of the 2nd leg of search? .....

At 0634 you sight an enemy cruiser at the limit of visibility. When you head directly for the enemy you have a magnetic heading of 146°.

7. What is 0634 enemy position?
Lat. .....
Long. .....

(Answers on page 40)

—TO AUSTRALIA

The Tokyo radio said recently in an English-language broadcast that the United States is suffering from a "serious shortage" of high ranking Army officers. Proof of this, Tokyo said, was the Senate Military Affairs Committee's recent action approving the promotions of a group of high ranking Army officers.

—TO AMERICA

The B-29 *Superfortress* raid on the Japanese mainland was a "mere propaganda stunt, and it is now a definite conclusion that the enemy from the very beginning undertook this mission for such purposes rather than deal an actual blow to Japan." "The enemy's vaunted B-29 *Superfortresses*, being larger than ordinary bombers, were easier targets for our fighters. This was the unanimous opinion of members of the Japanese fighter unit which shot down a B-29 in the 'feeble raid'."

—TO JAPAN

A "large corps" of Japanese women has been mobilized for work as stevedores. The female stevedores are "about 20 years old" and most of them come from farm areas. Domei says that these workers often go "two days and nights without any sleep" and "four or five days with only two hours of sleep." Their greatest hardships are "lack of sleep and hunger." The women live in barracks under military conditions and "when emergency loading begins under military orders, the work must be completed regardless of the weary condition of the workers."

—TO OCCUPIED CHINA

Elementary and secondary school teachers in Japanese-occupied Shanghai "cannot afford a square meal a day on the salaries they receive" and "education work has fallen" as a result. To "alleviate the situation" and "prevent tragedies" the local "education societies" have decided to call on the parents of students to make contributions to a "teachers' salary supplement" once each term.

—TO NORTH AMERICA

Axis representatives recently met in Tokyo to discuss "ways and means to strengthen Axis ties as well as to bolster air strength" and "took an oath to do the utmost for further bolstering air strength to destroy the Anglo-American enemies."

—TO JAPAN

Quoting an "official notice," a recent broadcast cautioned the Japanese people against exhibitions of panic and urged them to be prepared at all times for the immediate evacuation of their homes. Declaring that "the enemy is designing to push forward his advanced bases," the broadcast said that "we do not know when our homeland and our great sky will be transformed into a gigantic battleground."

TRAINING CENTER OCCUPIES CHICAGO VOCATIONAL SCHOOL PREMISES

87th & ANTHONY

Specialized Technical Training Grooms Picked Aviation Mechs

FOR EVERY PILOT who flies a Navy plane, ten to twenty groundcrewmen are needed to keep that plane in ready flying and fighting condition. Aviation mechs picked from squadrons and activities for their capacity to absorb stiff training are being taught latest technical and maintenance procedures at the Navy's Technical Training Center at 87th & Anthony Avenue, Chicago.

The Center is administered by the Naval Air Technical Training Command and specializes in all the highly technical subjects the aviation mech must master. Major courses given cover aircraft engines, carburetion and fuel systems, propellers, instruments and hydraulics.

MOST STUDENTS go to 87th & Anthony for long courses (12 to 16 weeks); a smaller percentage take the quick refresher courses lasting two to four weeks. To make sure that training is given to the men who need it *when* they need it, BuPers has established a policy of assigning quotas to the various major commands, and they, in turn, distribute them among subordinate commands.

Thus even the smallest operating unit can send a qualified man to the specialized Technical Training Center for instruction along a specific line, and get that man back on completion of his training. Men assigned require reasonable background in the subject to be studied.

IN SMALL GROUPS PERMITTING INDIVIDUAL INSTRUCTION, STUDENTS AT CENTER LEARN INTRICATE MECHANISM OF CARBURETOR, ONE OF MANY CLASSES

CENTER HAS MODERN EQUIPMENT, STAFF OF EXPERT INSTRUCTORS

EIGHTY-SEVENTH & ANTHONY is not the largest technical training center in the naval air establishment, but its location, compact set-up and facilities give it an edge in concentrating on advanced technical training.

The Center got off to a fine start in 1941 when the Navy took over the educational pride of Chicago, the new seven-million-dollar vocational school building. The building was designed from the ground up as a vocational school. It is spacious, having well-ventilated shops, classrooms, tool cribs, lockers, auditorium, library, gymnasium, mess hall, swimming pool and additional facilities. A few changes by the Navy have brought sick bay, disbursing and small stores, and a ship's service.

There is a well-stocked library, with reading for relaxation as well as many technical texts, and the auditorium is large enough to serve for entertainment as well as lectures. Outside there is a hangar accommodating repair facilities for various types of planes on which students work.

The Navy called in expert talent to help prepare the various curricula, order equipment, plan shop layouts and select instructors. Men with experience in industry (Pratt & Whitney, Wright, Curtiss, Hamilton, American Airlines, Stromberg, Holley, Eclipse, etc.) worked side by side with carefully selected Navy men. Nearly every major manufacturer includes the Center as a scheduled visit for field representatives and service men and, as a result, 87th & Anthony keeps abreast of all latest technical information and maintenance procedures applicable to U. S. Navy planes.

SHOPS house millions of dollars worth of equipment for students' use in working out assignments. Each man gets experience in disassembling, assembling, trouble shooting and testing various units. The value derived is that students gain confidence in their ability to *think* and *do*, which comes only from practical experience. Time is precious, and every course is streamlined to provide maximum instruction.

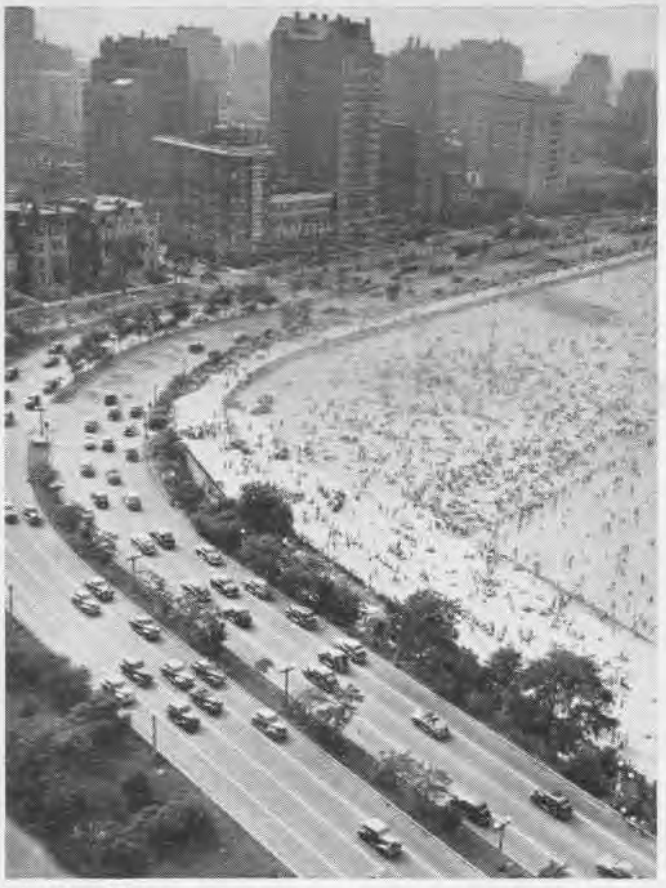
Portion of the regiment identifies the student body as naval complement. Drill and parade are part of the school's curriculum

Hospitality to servicemen is familiar, well practiced custom in Chicago area. Service centers give out eats, entertainment free

SPECIALIZED TECHNICAL TRAINING COURSES

	COURSE	NO. WKS.	CONVENES	QUALIFICATIONS NEEDED	CURRICULUM
SHORT REFRESHER COURSES	AUXILIARY POWER PLANTS	2	31 July & every other Monday	AMM and AEM if qualified, and equivalent Marine rates	Maintenance of auxiliary power plants
	HOLLEY CARBURETORS	2	Every Monday	Rated or non-rated, but must be experienced on carburetors	Maintenance, overhaul of Holley carburetors
	STROMBERG CARBURETORS	2	Every Monday	Rated or non-rated, but must be experienced on carburetors	Maintenance, overhaul of Stromberg injection carburetors
	R-1820 ENGINE	3	Every Monday	Experienced engine mechanic	Maintenance, service, trouble shooting R-1820 engine. Learn modifications, improvements
	R-1830 ENGINE	3	Every Monday	Experienced engine mechanic	Maintenance, service, trouble shooting R-1830 engine. Learn modifications, improvements
	R-2600 ENGINE	3	Every Monday	Experienced engine mechanic	Maintenance, service, trouble shooting R-2600 engine. Learn modification, improvements
	R-2800 ENGINE	3	Every Monday	Experienced engine mechanic	Maintenance, service, trouble shooting R-2800 engine. Learn modifications, improvements
	AIRCRAFT HEATERS	2	31 July and every other Monday	AMM3c or higher	Maintain, install, overhaul, test, operate aircraft heaters, portable ground preheaters.
	BOSCH MAGNETOS	2	Every Monday	Experienced magneto men	Overhaul, maintain, repair of Bosch ignition gear, including timing magnetos to engine
	SCINTILLA MAGNETOS	2	Every Monday	Experienced magneto men	Overhaul, maintain, repair of Scintilla ignition gear, timing magnetos to engine, etc.
	CURTISS ELEC. PROPELLERS	4	Every Monday	Experienced in propellers; background in electricity	Maintenance, overhaul of Curtiss electric propellers
	HAMILTON STAND. HYDRO. PROPELLERS	3	Every Monday	Experience in propellers	Maintenance, overhaul of Hamilton Standard Hydromatic propellers
	AIRCRAFT STARTERS	2	Every Monday	AMM3c or higher; should have knowledge of electricity	Maintenance of Jack and Heintz, Bendix-Eclipse, Breeze starters
	TURBOSUPERCHARGERS	2	Every Monday	AMM3c or higher; AMM(C)3c or higher	Maintenance, service, inspection, installation of turbosuperchargers. (Type B-2)
	HYDRAULIC EQUIPMENT ON TURRETS	2	Every Monday	Experienced in hydraulics	Maintenance, overhaul of turret, hydraulic equipment
LONG COURSES	ADV. ENGINE MAINTENANCE	16	Every Monday	AMM3c or higher	Use of hand tools, fundamentals of aircraft, instruction on various engine types; accessories, overhaul; test cells; line operations
	CARBURETORS	14	Every Monday	AMM2c or higher	Float type carburetors, fuel pumps: overhaul, disassembly, inspection, repair, replacement, reassembly: Holley and Stromberg, etc. Qualifies rating for AMMC
	PROPELLERS	12	Every Monday	AMM3c or higher	Maintenance, overhaul, including ground adjustable and two position constant speed, hydromatic, Curtiss electric; blade repair, line operation. Trouble shooting, field checking. Qualifies rating for AMMP
	INSTRUMENTS	16	Every Monday	AMM3c or higher, or experienced instrument man	Operation, repair, maintenance, calibration, testing. Includes pressure instruments, compasses, electrical instruments, gyroscopic instruments and automatic pilots: installations, field testing. Qualifies rating for AMMI
	HYDRAULICS	12	Every Monday	AMM3c or higher	Hydraulic principles; oils, packings, hydraulic units, systems and their arrangements, testing, trouble shooting. Disassembly, checking of hydraulic system on turrets, miscellaneous equipment (de-icing, and anti-icing systems, etc.). Qualifies for AMMH

Correction under Long Courses above: Qualifications for Carburetors is AMM3c or higher



Lake shore drive, heralded Chicago beauty spot and bathing center, is but few miles from the Navy's Technical Training Center

Metropolis of Chicago is short jaunt by train. Students in training spend their time-off seeing the city and going to its shows

CANDIDATES FOR TRAINING FILL QUOTAS ASSIGNED TO COMMANDS

IN ORDER TO spread the advantages of specialized technical training among all aeronautical activities, BuPers has assigned quotas to major commands, which then are assigned to subordinate commands. The co of an activity, receiving his quota, will discuss his allotment with the engineering officer, requesting appointments to fill the quota. The engineering officer then screens his complement for ratings whose experience in the subject qualifies them for advanced technical training at the Center.

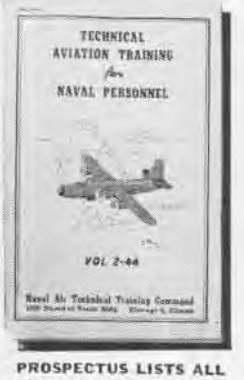
For special cases, where specific individual training is needed in a hurry, NATTC provides short courses of two to four weeks' duration (*see chart*). The courses are maintained solely for men who have had prior experience in the field, but who lack information on latest technical procedures that have been developed.

The engineering officer of a squadron, for example, realizing the need for greater skill in servicing the planes of his squadron, selects a qualified AMM for a particular course and requests authorization to send him to the Chicago Center for a short refresher course. The co transmits this request to ComAirLant (if Atlantic) who then will consolidate all requests of this nature from subordinate commands, then request a quota assignment from BuPers.

AS MEN with no previous experience in the subject profit little from the short courses, quota assignments to them are not mandatory. As in all highly technical schools, some trainees cannot make the grade, and at 87th & Anthony some must be returned before their course is completed, although considerable effort is made, by individual instruction and coaching, to bring the men up to the standard of the class. It works more to the advantage of activity, student and Center when men are selected for courses by experience.

Ratings Should Be Sent to Chicago All Equipped

ENLISTED MEN should not be sent to Chicago for general technical training, but for specified courses only, as listed in the *Prospectus* published by the Naval Air Technical Training Command (*see cut right*). Men returning to their command after completion of their course should be provided with round-trip transportation. Service records and pay accounts of so-called short-course students remain with the transferring command, but personnel take along health records and enough money to cover sundry needs during transportation. Men assigned to long courses must bring service records, pay accounts and health records. Men not returning to originating commands require one-way transportation only, and should be given all records to take with them.



PROSPECTUS LISTS ALL THE SCHOOL'S COURSES

Men reporting for instruction are required to have reasonable background in the branch of technical procedure they will study. As a means of restricting courses to picked students who promise to be able to keep pace with the curricula, NATTC has been given authority to reject and return applicants whose background does not qualify them for the training. Qualifications of candidates for this advanced technical training are laid down in the *Prospectus* and excerpted in the NAVAL AVIATION NEWS chart appearing on p. 19.

AVIATION MECH FROM SOUTH PACIFIC TAKES ADVANCED HYDRAULICS

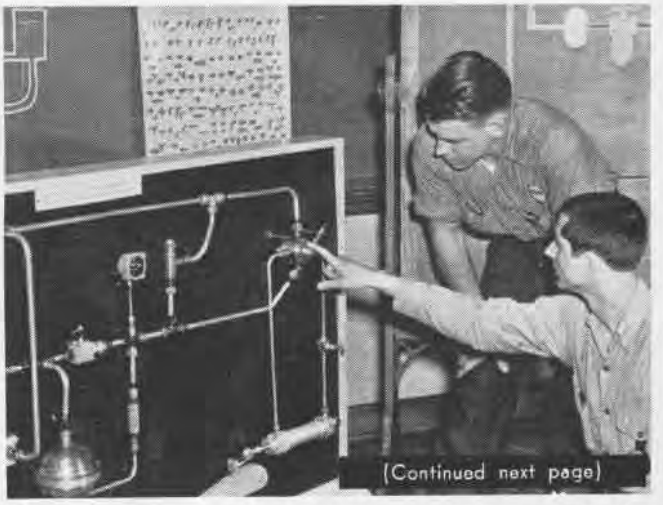
Raymond Dalton Kelly, AMM1c, arrives from the South Pacific for a course in Advanced Hydraulics at Technical Training Center, 87th at Anthony Avenue, Chicago. He's been out there and has helped to prepare planes for action against the enemy. So he knows that victory over enemy planes and craft depends as much on his efficiency as an aviation mech as it does on skill of the pilot, accuracy of the plane's gunner or air bomber. Kelly's co knew that he was qualified, sent him to bring back latest dope

Hydraulics Student Had Action Career

KELLY was born in Modesto, California. He joined the Navy in November 1942 at San Francisco. Taking his boot training at Farragut, Idaho, went overseas in the spring of the next year, joining a Pacific CASU.

With the CASU, he serviced various types of planes that were in the thick of the fighting: SBD, TBF, F4F, F6F, P-38, P-39 and B-25.

After a year of active service on advanced bases, he came back to this country and reported to the Naval Air Technical Training Center at 87th & Anthony for a course in advanced hydraulics. His training there carries him through all details of maintenance procedure, emphasis being on handling equipment.


(Continued next page)

1st week. Basic units of hydraulic systems and the principles that govern them are studied first-hand by Machinist Mate Kelly under close supervision of competent instructors who can give him what he needs. Working with actual equipment is the rule

(Continued)

2nd week. Power and miscellaneous units occupy Kelly for a full week, testing Vickers 7-piston pumps and becoming familiar with many hydraulic pumps, such as the gear, vane, Gerotor types. Kelly studies oils, packing, reservoirs, relief valves, flow dividers

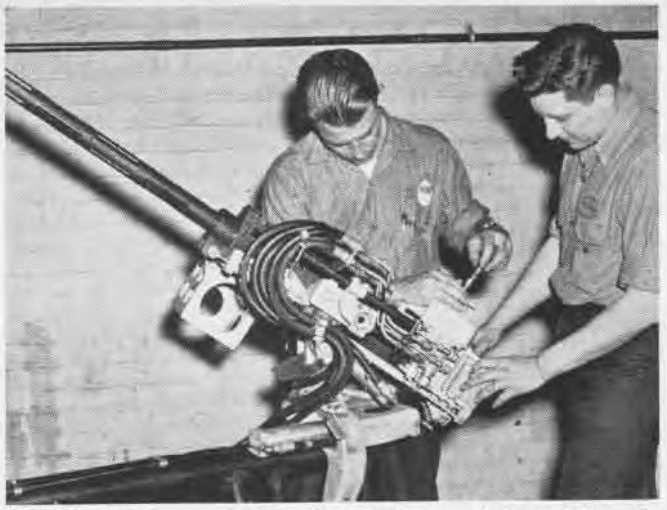
3rd week. Far from casual inspection, Kelly learns function, maintenance, bench inspection, disassembly, cleaning, flow tracing, testing and final inspection of the F4U and many other selector valves. He'll need this knowledge back at the advanced base

Commando tactics. Kelly doesn't go soft physically during his twelve-week stay at 87th & Anthony. Programs of physical fitness keep him wiry for quick thinking and fast action in emergency. Scene shows part of Center's obstacle course on station

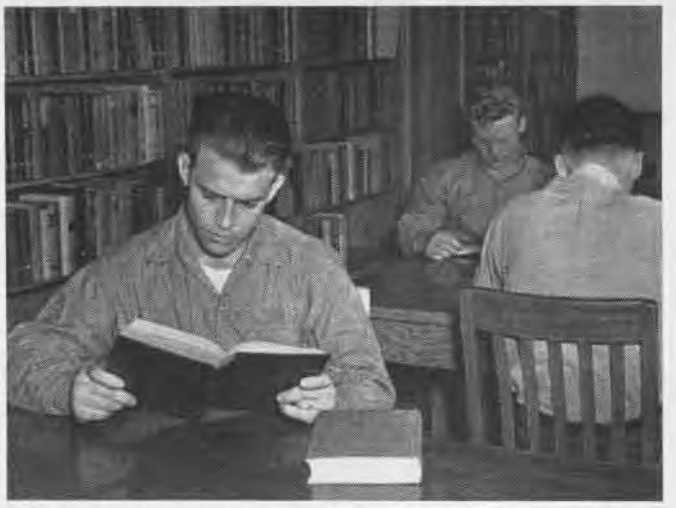
4th week. Regulating and miscellaneous units may have been Greek before, but Kelly now will know Vickers, Electrol, North American, Douglas, Bendix and other regulators; line disconnects, pressure gauge snubbers and accumulators, filters, orifice checks

5th, 6th weeks. Hydraulic units for wing, landing gear and brakes include lectures, but most of what Kelly learns comes from handling equipment: boosters, temperature and wing-flap relief valves, shuttle valves, locks, shock struts, power brakes, master cylinders. Kelly learns a great deal about servicing he didn't know before

7th, 8th weeks. Working on plane models near hangar outside, Kelly gets thorough grooming on hydraulic systems of F4U, F6F, TBF, SB2C, SBD. Mock-ups and schematics are freely used on these as well as other models, to combine theory with practice. After this course, the mech won't be vague on plane hydraulics

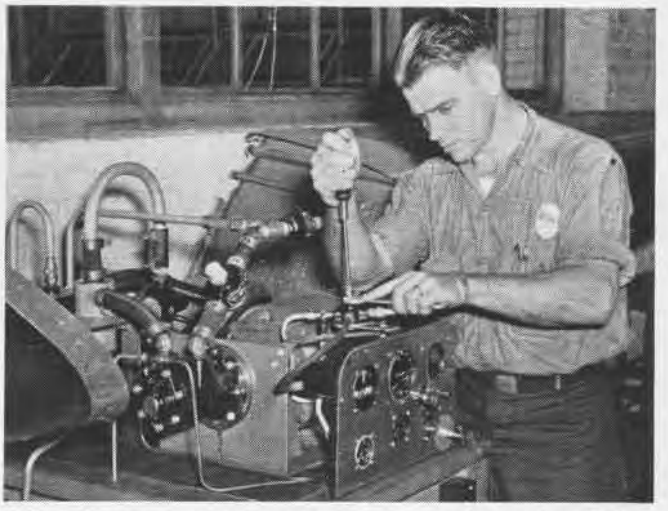


9th week. Moving to turrets, the aviation mech in training adjusts hydraulic power and control units. He manipulates Vickers variable displacement pump, double power unit, Vickers, United Shoe, Clark Control valves in this important week of curriculum



Library. Books on technical subjects are handy for Kelly to brush up on background. Center's library also maintains assorted volumes on general interest for lighter reading. Other diversion includes Chicago's near-by attractions and service centers

10th, 11th weeks. In turret familiarization. Kelly gets the dope on maintenance and trouble shooting. He learns operation, part location, system tracing, adjustment, inspection of various types, such as Sperry, Consolidated, Erco and Martin aircraft turrets



12th week. De-icing and anti-icing equipment do not directly bear on hydraulics, but Kelly investigates this equipment as coming under head of miscellaneous related apparatus. By now Kelly has had a thorough grounding in all aspects of hydraulics

NOW A GRADUATE OF ADVANCED HYDRAULICS COURSE, KELLY IS READY TO RETURN TO HIS SQUADRON WHERE HE WILL PASS ALONG LATEST DOPE

HYDRAULICS STUDENTS SAY THEY LEARN PLENTY AT CENTER

THE ALL-AROUND mechanic who could fix anything in a plane from the tail skid to the propeller with a screwdriver has vanished as completely as the Curtiss *Jenny*. In his place is the aviation technician, the specially trained man without whom no Navy plane could fly to fight against the enemy.

Training technicians to take their places side by side with the combat men of the air has required many instructors, quantities of equipment and well planned organization. Technical training schools set up by the Naval Air Technical Training Command throughout the country have been the means of providing squadrons at sea, advanced bases and stations in the U.S. with complements of skilled men who service and repair the Navy's fighting aircraft, keep them in condition to carry out varied types of missions.

The Naval Air Technical Training Center at 87th & Anthony, Chicago, has been developed as an advanced training school to give aviation mechs with promising qualifications the latest technical procedures in aircraft maintenance.

Students at the school derive real benefit from the courses because they study from week to week without interruption and have latest types of equipment to work with under the guidance of expertly trained teachers.

For aviation mechs who, in squadrons and A&R shops, have serviced and repaired aircraft without fully understanding important details of engines, carburetion, fuel systems, propellers, instruments and hydraulics, NATTC provides solid technical grounding in work on planes.

NAVAL AVIATION NEWS, while in the Hydraulics school, asked mechs whether they were getting any good from the courses. Their answers are shown below.

Marines: Walter Wheatley, T/Sgt.

HAVING completed fifteen months overseas, I was sent back to the States, then to NATTC Chicago to study hydraulics. Although I had a slight knowledge of hydraulics, the theory and operation of the different units were not very clear.

Having completed eight weeks of the course, I see it has been well planned and covers aircraft hydraulics thoroughly. The instructors are capable and the methods of teaching are clear as well as easy to understand.

Coco Solo: William Jaszczak, AMM1c

ENTERING this school, I didn't have any hydraulic experience on aircraft. Therefore, all the studies here have been very new to me. Hydraulics here has been so interesting and well taught that I can truthfully say that when I get back to my base, or any base, I can work hydraulics and do a damn good job of it.

The material as well as the notes I am receiving from day to day will be an important part of my tool box as long as I remain an aviation mech.

Pensacola: Robert W. DeGuire, AMM1c

DURING the three years I have served in the Navy, I have worked primarily on engine overhaul and installation. I enjoyed my work, but quite frequently came in contact with hydraulic trouble. When I arrived at NATTC in Chicago, I knew very little of hydraulics. . . . I have learned a lot since my arrival here.

When I return to my operating unit, I expect to make very good use of what I've learned here. I will have been given a fine start in hydraulics.

Pacific: F. J. Broussard, ACMM

I CAME to NATTC for the purpose of increasing my knowledge of hydraulics, and this school has done so in every respect, due to the exact and precise instruction I have received. The outstanding advantage or asset of this school is the detailed instruction received while disassembling, assembling and testing of units and systems in the shops and on aircraft.

The schematics, mimeographed instructions plus the notes I took will be invaluable to me when I get back.

South Pacific: Thomas A. Dugdale, AMM2c

I WORKED in aircraft tubing and hydraulics for three and a half years before coming into the Navy. After spending a year in the South Pacific, where I worked in a hydraulics shop, I was sent to NATTC and have learned things pertaining to hydraulics that it would be impossible to learn any other place.

The notes and drawings of units and systems will be invaluable to me or any other hydraulic man when working on planes we have in the Fleet.

S. W. Pacific: Rex C. Tulloss, AMM1c

I HAVE found the Hydraulics School to be very complete. The equipment is not only the latest but also includes every type used in the Navy. The shops all have test stands and mock-ups, which I found very helpful in understanding units and systems.

The instructors are cooperative and thoroughly understand the subjects they are teaching. Frankly, I am glad I have had the opportunity of attending this school and, as a result, I feel I will be more valuable to the Navy.

Navy planes could not fly, or pilots and aircrewmen fight, if it were not for the ground and deck crews who have been skillfully trained to keep those planes in flying and fighting trim

BEACHING NAVY AIRPLANES

MARINER GETS ITS FACE WASHED—ONE OF THE TASKS OF THE BEACHING CREW IS TO REMOVE CORROSIVE SALT WATER FROM FLYING BOATS ON THE RAMP

Beachmaster and flagman work together to bring in OS2U to ramp at Corpus Christi. Poor timing and signals to pilot could cause damage to plane which maneuvers carefully with wind and tide

Beaching crew attaches wheel to PBY so that it can be towed up on ramp after day's operations. Wheels are partly-filled with water to reduce buoyancy so they can be submerged and attached

Coronado flying for NATS is pulled up to ramp at Kaneohe Bay by beaching crewmen, two of whom swam out to attach lines to stern. Careful handling of planes is necessary to avoid damage

In contrast to Hawaiian scene opposite, ground crewmen at Kodiak wade through ice to beach *Catalina*. Waterproof beaching suits are necessary, worn over clothing, to fight chill of Arctic water

TANNED CREWMEN IN SWIMMING TRUNKS PULL ON LINE TO BRING PBY NEAR RAMP SO THAT BEACHING WHEELS CAN BE ATTACHED AND PLANE HAULED UP

Depends on Skilled Beachmaster and Crewmen

THE OLD adage about letting one's hand know what the right hand is doing is applied appropriately to operations of beaching crews who work together to get Navy flying boats and seaplanes in and out of the water.

The beaching crewman's job at times probably is one of the most unglamorous and unpleasant in naval aviation, but upon these men, working under experienced beachmasters, depend thousands of dollars' worth of airplane. A poor or sloppy beaching crew can cause damage that will take weeks to repair. They can clog up ramp operations so badly it will be hard for planes to get out or come in without long delays.

No standard textbook on how to beach planes has been issued, the instruction of seamen in tricks of the work being handed down from experienced crewmen to beginners like the arts and crafts of other days.

Key man to keep the ramps operating smoothly is the beachmaster. He is the quarterback of the beaching crew, directing operations of the tractormen, flagmen and others. Improper work by tractors easily could smash a P-boat on the ramp by letting it run wild down or off the incline. Synchronized teamwork while the plane is being lowered or raised is highly important.

Planes must be spotted in the hangars and on the ramp so that taking off and storage at the end of the day go off with a minimum of delay to training operations—another job for the beaching crews. Wheels and other gear must be stowed in orderly fashion to keep the system working smoothly. They should be protected from the elements —sun and water—to conserve the rubber and other materials.

Presence of a flat sandy beach simplifies beaching work, but all stations using P-boats, OS2U's or other waterborne planes do not have places where they can be nosed into the sand. Some use buoys anchored offshore, with block and tackle to secure the nose of the plane while the tail line is attached to pull it up to the ramp. The beachmaster must estimate wind drift, tide and other factors in directing his crew's operations. Sometimes sea anchors must be tossed out to slow the drift or men may ride a wing to put the float under water to act as a drag on side.

AIRCRAFT, unlike a sailboat, tend to nose into a wind, so maneuvering them to a ramp sometimes becomes a ticklish problem. Various strategems may have to be used to bring it alongside without tearing off a float or stoving in the hull.

Wing, bow and tail lines may have to be manipulated along with speeding up or slowing down the engines to maneuver the plane. Buoys or other anchorage spots are approached usually from downwind for better control. Cross-tides or winds complicate maneuvers and must be taken into account.

NOT ALL BEACHING OPERATIONS ARE DURING DAYTIME: HERE CREWMEN ATTACH THE CATALINA'S WHEELS SO TRACTORMAN CAN PULL IT FROM WATER

CORRECT DITCHING SAVES LIVES

KNOWLEDGE of correct ditching procedure—how and where to station the crew for a water landing—has saved many lives both in combat action or on training maneuvers. An example of this is found in the story of a PV-1 which had to ditch 375 miles from land in an overload condition while on a transocean flight.

Prior to ditching, emergency equipment had to be stowed near the main escape door which had been padded partially open to prevent jamming. The pilot's escape hatch and the astro hatch were jettisoned. All crew members were at their prescribed ditching stations.

The landing was made across the wind and swells. The pilot made a tail first landing, then rode forward on the yoke. The plane came to a steady stop without severe jarring and remained afloat for about one and one-half minutes.

On landing, the bomb-bay tanks burst into flames. Spray entered through the pilot escape hatch preventing severe burns to the pilot, co-pilot, and radioman who were forward. In the meantime, flames enveloped the fuselage, forcing the plane captain and gunner to abandon ship immediately without obtaining their carefully stowed equipment. Through the open rear escape door the pilot spotted the life raft with its cover on fire. He dived from the wing and came up at the escape door. Grabbing the raft, and putting a foot on either side of the door, he heaved, and went back under the flaming water.

While this was going on, plane captain, with his lifejacket uninflated, was swimming under water to avoid the burning gasoline. Each time he came up, the flames would singe his hair and down he would go again. Finally, he got clear and inflated his lifejacket.

By this time, gunner who had been yelling for help, had gone down and had been under about ten seconds when the raft got to him. He was blue and unconscious when rescued, but on pulling him aboard, he regurgitated, started breathing, and his color began to come back.

A check-up showed the men who had been aft in the airplane were suffering from burns. They were treated with burn ointment from the first aid kit. Gunner, who suffered the most, had also made most mistakes. He was wearing a shirt with sleeves cut away and had closed the oral inflation tubes to his lifejacket, thus allowing the CO_2 to escape.

After three squally days, the fourth day brought fair weather and a hot sun. The tarpaulin was used as a sun shield for crew, and those on watch used an undershirt for head covering and socks for gloves. Sun glasses were used and inflated Mae Wests served as cushions.

Dye markers were used frequently. Planes were seen daily, but they were too far away or too high to see the Very stars. Finally, an Army nurse, a passenger in a Pan-Am C-54, saw the dye marker from 800 feet. On closer examination, she saw flashes from signal mirror and told pilot.

As the C-54 started circling, a PB4Y picked up the C-54 and appeared on the scene. Both planes started dropping equipment and a Gibson Girl radio, dropped by the C-54, was recovered. The radioman had been checked out on this equipment which proved most valuable.

They were rescued by an Army crash boat the middle of the fifth day, 260 miles from the mainland. The crash boat homed on the signals from the Gibson Girl.

Some points worthy of mention, brought out by the report, are as follows:

1. On flights of this nature, gasoline should not be burned from droppable tanks until jettisoning of these tanks will permit single engine operation

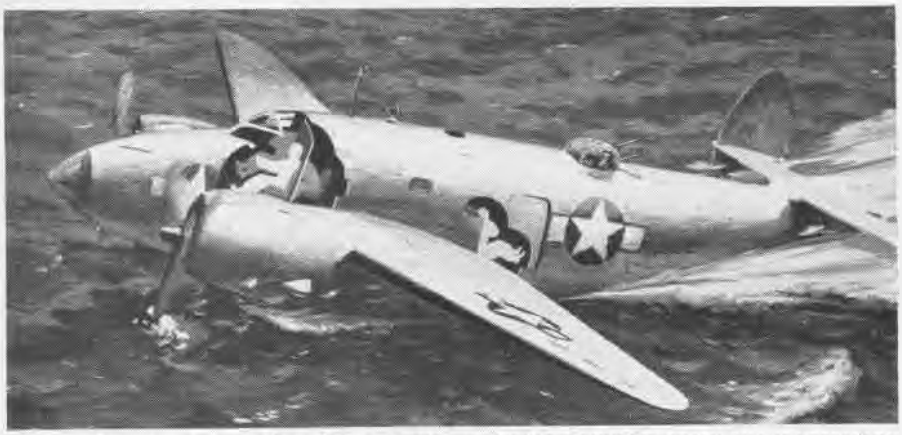
2. Radioman contributed materially to the success of the ditching by sending out his position and by locking his key down as the aircraft started its landing glide. His knowledge of the Gibson Girl Radio enabled the crash boat to home on his transmissions

3. When dropping supplies to survivors, the drops should be made *downwind* from the raft because the raft is somewhat unnavigable to start with, and strength of the survivors may be at low ebb after having spent several days in a rubber life raft.

4. It is re-emphasized that the entire body should be covered as protection against flash burns. Gloves and full-sleeved shirts, or flight jackets, protect against the initial flash and primary shock of fires

5. Any item of emergency equipment may be key to successful rescue. So know how to use each item

6. Premature inflation of lifejackets would have prevented swimming under water while gas was burning on surface.



WITH ONLY THIRTY SECONDS TO ESCAPE FROM PV-1 LANDING ON WATER, CRASH BILL IS NECESSARY

BEST ANSWERS

Canada

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

1. The area of Canada is about equal to that of—

- ☐ *a*–the United States
- ☐ *b*–Great Britain
- ☐ *c*–Germany
- ☐ *d*–France

2. The population of Canada is about—

- ☐ *a*–10,000,000 people
- ☐ *b*–5,000,000 people
- ☐ *c*–100,000,000 people
- ☐ *d*–50,000,000 people

3. The largest city in Canada is—

- ☐ *a*–Ottawa
- ☐ *b*–Quebec
- ☐ *c*–Toronto
- ☐ *d*–Montreal

4. The monetary unit of Canada is the—

- ☐ *a*–franc
- ☐ *b*–pound
- ☐ *c*–dollar
- ☐ *d*–shilling

5. The capital of the Dominion of Canada is—

- ☐ *a*–Montreal
- ☐ *b*–Ottawa
- ☐ *c*–Quebec
- ☐ *d*–Ontario

6. Of the following the one that is *not* part of Canada is—

- ☐ *a*–British Columbia
- ☐ *b*–Yukon
- ☐ *c*–Newfoundland
- ☐ *d*–Nova Scotia

7. Canada is bounded by—

- ☐ *a*–one ocean
- ☐ *b*–two oceans
- ☐ *c*–three oceans
- ☐ *d*–four oceans

DID YOU KNOW?

Speed the Day of Victory

War Bonds Are Paving the Road

"The officers and men of naval aviation pledge themselves to continue the fight until the last Japanese flag comes down from the last Japanese island. Your liberal purchase of war bonds will provide the material means through which we may play our full part in speeding the day of victory."

—Rear Admiral D. C. Ramsey, USN
over Mutual hookup

Kingfisher Saves Man's Life

OS2U Is Used as Ambulance Plane

NAS KODIAK—The Navy's useful *Kingfishers* have added a new job to their list of accomplishments—acting as ambulance planes in the Aleutians, where natives have come to regard the pilots as "angels of mercy."

One squadron in the area reports it has had three radio messages calling for air ambulance service during a two-months' period, requesting immediate transportation for sick and injured persons stranded in the North Pacific's vast wilderness of islands.

In each instance, a pilot and seaplane immediately were sent to rescue and transport the patient to the nearest medical facility. Although the rear cockpit of the OS2U-3 is not designed to carry medical patients in comfort and with the greatest degree of safety

INJURED MAN IS FLOWN IN KINGFISHER COCKPIT

for his condition, it has been adapted to carrying a removable, regulation basket stretcher.

The first rescue mission in this squadron was to fly out a man with a serious head injury who was on a ship docked alongside a small fish cannery at an outlying island. An ambulance *Kingfisher* landed beside the ship. The injured man was put in a skiff and rowed to the plane, where the stretcher was loaded aboard the wallowing plane.

An ambulance with a doctor and hospital corpsman met the plane at its destination. As soon as a platform could be rolled up to the beached plane, the doctor checked the patient's condition and he was unloaded into the car and taken to the hospital.

Board Checks Absenteeism

Shows Employees Who Skip Jobs

NAS SEATTLE—Uncle Sam's finger pointing at the percentage of attend-

SIGNBOARD ADVERTISES A&R ABSENTEE PERCENT

ance is a new incentive to civilian employes in the A&R Department.

The billboard is prominently displayed at the main entrance and is attracting wide interest. J. R. Perry of the Paint Shop is shown in the photograph with his handiwork.

Miniature Wings Are "Out"

Use on Caps Is Non-Regulation

The Navy Uniform Section calls attention to a non-regulation practice among naval aviators of wearing miniature pilot's wings on their garrison caps.

At one time such insignia was authorized for use on the caps, but this was cancelled on April 10, 1943, at the request of aviators who wanted to wear the regulation Navy insignia on the left side of their caps. The miniature insignia is one-half the size of the regular pilot's wings. It is now regulation only when miniature medals are prescribed —that is, on full dress during peacetime.

Airfield Changes Its Name

Isely Field Remembers TBF Pilot

Aslito airfield on Saipan Island has been renamed Isely Field in honor of Commander Robert H. Isely, commander of VT-16, who was shot down by Jap AA as he led a bombing attack on the field. Commdr. Isely took part in the attacks on Tarawa, Kwajalein, Palau, Woleai and Truk. He flew aerial cover for Gen. MacArthur's troops at the Hollandia landings. The change in name of the airfield was made by Admiral Chester W. Nimitz on recommendation of Vice Admiral Marc A. Mitscher.

Glenview Lists Plane Data

Traffic Chart Aids Control Office

NAS GLENVIEW—This station recently installed a novel device for following plane movement on its busy landing field. The device stands six feet high, resting on a metal base, with plane information kept on a revolving metal hexagonal.

Each of its six sides is a different color to enable air traffic controllers to find desired information rapidly on the flight progress boards. Sections of the hexagon are divided into Inbound, Inbound Rovnite, Outbound, Outbound

REVOLVING DEVICE AIDS IN TRAFFIC CONTROL

Rovnite, Disposition Delivery and Miscellaneous.

NAS Glenview handles a heavy flow of traffic, the control tower recapitulation for May alone revealing that there were 8,181 radio contact flights worked by Navy Glenview tower. Of these 98 were actual instrument flights. The air traffic control office was moved into a section of the main hangar building.

Rescuers Fight High Seas

PBY, Blimp, Ship All Join in Effort

Battling heavy seas and a high wind, a Navy blimp, a destroyer and a *Catalina* flying boat joined forces in a dramatic but unsuccessful attempt to save the life of a pilot whose plane crashed into the ocean off San Diego.

The PBY attempted the rescue, landing near the injured flier who was kept afloat by his life jacket but heavy seas prevented the *Catalina* from reaching him. A patrol blimp dropped a rubber boat and when the pilot made no attempt to reach it, the blimp's radioman was lowered on a line and dived into the ocean to help.

Unable to maneuver the rubber boat through the rough sea, the radioman abandoned it and swam toward the airman but the PBY reached him first. The pilot of the blimp maneuvered his airship low over the water, dragging his short lines in the sea. The radioman grabbed one of the lines and the pilot towed him to the patrol flying boat.

BLIMP TOWS SWIMMER TO THE RESCUE PLANE

Unable to take off in the high sea, a destroyer was called and both men were transferred to the ship for medical care. The rescued pilot was dead, however, when taken aboard the ship.

N2S Salvage Saves Money

"Worthless Junk" Pays Dividends

NAS DALLAS—When an aircraft as simple and rugged as the N2S is damaged beyond repair, it usually looks like worthless junk. But if you ask the salvage division of the A&R department at this station if any of a crashed plane can be salvaged, the answer is almost always: "Most of it."

The salvage division will concede just five items as probably worthless: the fuselage frame, the fabric, the wing spars, the propeller (less the hub), and the glass in the windshields. Their experience shows that other parts of the aircraft often are salvageable.

The salvage division has justified its existence on the basis of money value of parts and assemblies rescued from the scrap pile. Perhaps even more important are the many occasions on which salvaged items have permitted speedy repair of aircraft which would otherwise have languished in the hangar awaiting parts on the "out-of-stock and temporarily unobtainable" list.

Hurried and rough-shod methods are banned. Every care is taken to prevent further damage while dismantling the airplane in the field. Experienced men can pick up a crash gently in but little more time than that required for rough and ready jobs. Even when an aircraft is brought into the hangar obviously beyond repair, no part of it is classified as scrap until inspection shows that it cannot be salvaged. Hydraulic lines, oil lines, conduits and control cables may be twisted and torn, but fittings attached to them are seldom damaged and can be removed for future use. While the majority of metal assemblies can be salvaged, even those which are irreparably damaged yield such valuable small parts as elastic stop nuts and often provide sub-assemblies.

A specific indication of the value of such work is the fact that a salvage crew of eight men frequently recovers in one day $50 worth of elastic stop nuts alone. Material from which everything salvable has been removed still has value as scrap. Clean aluminum at $7.50 per 100 lbs. is the most valuable. Iron and steel scrap, and aluminum which cannot profitably be cleaned, are lumped under the single classification of "scrap iron" and sold for $8 a ton.

FLIER SURVIVES U. S. DESERT

WHEN THE MARINES start comparing survival experiences, Lt. Z. will top them all with the most unique of all stories. The incident happened right in these United States, far from the combat zones of the Pacific. Instead of being stranded on the proverbial island, this Marine paced 140 miles across the sun-baked desert of Arizona for four long days and nights!

While on a routine flight with the squadron, his plane developed engine trouble. The division leader ordered him to bail out, and the Leatherneck left his fighter plane for the cactus and dust.

Upon landing, he spread out his parachute so that it could be seen from the air, then walked to where the plane had crashed to salvage whatever might help him return to civilization. A map was dropped by one of the planes, but it caught in the tree and was torn, making it practically unusable.

In the meantime, word was radioed back to the base. Searching parties were formed, and Army and Marine planes flew low over the desert in hopes they might see him. Another group which included Indian trackers started out on foot and followed the trail he left behind.

With a great expanse of nothing on all four horizons, Lt. Z. started wandering in an aimless direction. After walking for hours and hours, he dug into the sand and carved his initials four feet wide and 25 feet long. Then he wrote a note, "Going West," and started his trek across the desert in true pioneer style. He traveled only in the morning and evening to escape the intense heat. Strips of cactus, a small lizard and a large fly were his only sources of food and water.

Every day was a repeat of the previous one, and his traveling companions were flocks of vultures which flew over constantly. Every day, he saw the searching Marine and Army planes overhead, but was unable to attract their attention.

On the fourth day, he saw a small plane circling above and closing in toward him. He waited and hoped. The pilot saw him, swooped closer, and dropped a partially filled canteen of water. A short time later, a Jeep arrived with a doctor who administered first aid. The land and air search of more than 2,500 miles was ended and the Marine lieutenant is now back on duty at a West Coast Marine station.

Carriers

LET NANEWS HEAR FROM YOU!

TECHNICALLY SPEAKING

Grinding Device Saves Time

Attachment Fits on Valve Refacer

NAS MEMPHIS—An ingenious device for grinding rocker arm rollers has been developed by A&R. Rocker arm rollers that have pits or flat spots may be ground perfectly true without removing them from the rocker arm, saving time and material.

Although this device is made as an attachment to fit the Hall Valve Refacer, a similar attachment could be made for other refacers. It consists essentially of two parts: fixture that holds the rocker arm assembly square with the grinding wheel and which is doweled to the base of the grinder, and rubber cone driver mounted on a steel shaft.

In operation, the rubber cone drive shaft is mounted in the chuck of the refacer at the proper angle, to drive the roller through friction. In this manner, the roller is driven at a slow rate of speed against the grinding wheel. A very finely ground surface is obtained through use of a fine grit wheel and liquid compound.

▸*BuAER COMMENT*—Suggest removal of anti-friction bearing before grinding to avoid contaminating bearing with grit from wheel. If bearing is necessary for the mounting on the fixture, a bearing used solely for this purpose should be used and replaced after grinding with the bearing to be used in service.

Stitching Board Is Handy

Helps in Stapling Small Booklets

NAS NEW ORLEANS—To give even binding jobs on small printing jobs such as station publications, to save manpower and time, an enlisted man at this station has devised a jig fastener board. The board can be made in spare time from scrap. Bostichers can be fastened to the wood handle for permanent use or affixed to it in such a way that they may be removed for other use. The illustration shows two stapling machines being used to stitch together a station paper.

STITCHING BOARD HELPS IN BINDING PAPERS

▸*BuAER COMMENT*—It is suggested that the right side guide be removed and the left guide be made adjustable to handle various-sized publications. Only one side guide should be necessary. It is further recommended that such a jig be used sparingly as wartime economy of metal necessitates use of only one stitch on most small publications. WPB regulations provide that only one staple be used particularly for publications designed to be read and thrown away, not subjected to hard usage.

Pre-Oiling Benefits Engines

Forces Hot Oil Through Passages

NAS MIAMI—An engine pre-oiler, giving speedier and more efficient lubrication of new airplane engines prior to starting, has been produced by two aviation machinist's mates attached to torpedo bomber squadrons stationed here.

ENGINE PRE-OILING DEVICE BUILT FROM SCRAP

The device forces hot oil through all the oil passages of a newly-installed engine before it is started, thereby preventing starvation of oil to any part prior to the engine oil pump becoming effective.

Oil is heated in a reservoir tank, to engine operating temperature. It is then forced through the oil passages at engine operating oil pressure. Formerly the oil was pulled through the plane engine by turning the prop. The pre-oiler was constructed almost entirely from scrap salvage, the only factory-built parts being the motor and pump.

[DEVELOPED BY R. M. EZZELL, ACMM, AND KERR, AMM2C]

"Nailman" Sweeps Streets

Works Like Large Vacuum Cleaner

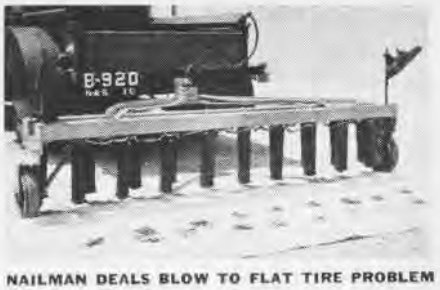
NAS BERMUDA—"The Nailman," a trailer contraption proposed by the transportation officer, not only has captured the fancy of station personnel, but is doing a bang-up job of keeping streets free of flat-tire-producing objects.

The trailer, towed by a pick-up truck, gathers nails and bits of jagged metal from the streets as easily as a vacuum cleaner sucks up lint from a rug. It has 19 coils, six volts each, wired in series, and uses approximately 120 volts. Current is supplied by a small gasoline generator mounted behind the truck cab.

The two-wheel trailer sweeps seven feet of road and suspends the coils in a vertical position so that they are but 3½ inches above the surface. When the coils have picked up so many nails that the nails are dragging the ground, a canvas is placed beneath the coils, the current turned off and the metal objects drop into the receptacle.

More than 350 lbs. of nails and other pieces of metal were gathered in the first 24 hours of sweeping. When a thorough sweep of the station has been made, the Nailman will call on other island activities and go to work.

▸*BuAER COMMENT*—Congratulations to NAS Bermuda on its development of "The Nailman." In the interest of rubber conservation and saving of scrap metal, other naval activities should consider the construction of similar units. Photostatic copies of drawings and any other information regarding construction of "The Nailman" may be obtained from NAS Bermuda.



NAILMAN DEALS BLOW TO FLAT TIRE PROBLEM

POWER PLANTS

Offer Timely Advice on Spark Plugs

An article on spark plugs appeared in *Naval Aviation Confidential Bulletin* of May 1944 which is definitely recommended reading. The whys and wherefores of the spark plug situation were covered and a lot of information and good advice was put out. Summarizing the article, the following general rules were given:

1. Use only a spark plug listed as acceptable for the engine in question
2. Be sure you really have spark plug trouble before blaming them
3. Don't get unreasonably prejudiced against any spark plug simply because some previous plug made by the same manufacturer was lousy, because you occasionally have poor plugs, or because all spark plugs will not work in all engines. Let each case be decided on its own merits
4. In case you really have well authenticated spark plug trouble and not ignition harness, magneto, carburetor, or some other trouble, notify BuAer by NUDM at the very first opportunity
5. Again, use only a spark plug listed as acceptable for the engine in question

Supercharger Clutch Needs Exercise

The number of supercharger clutch failures (especially with Wright engines) has been increasing at an alarming rate. By far the great majority of these failures have been due to cockpit and maintenance trouble in non-compliance with TN87-42.

If supercharger clutches are not exercised regularly, they will sludge up. When a sludged-up clutch is shifted to another ratio, the disengaging ratio often lags or does not disengage at all. The result of operating the drive in two speeds at the same time is obvious.

If supercharger clutches are wired in the low position, or never shifted, the high ratio often sludges up to such an extent that it drags and causes failure. This happens with so-called roller clutches also, despite some contractor rumors to the contrary.

Accordingly, it is recommended that all activities comply with TN87-42 and desludge supercharger clutches. Some squadrons have issued orders to their pilots to do all taxiing after flight in the high blower position. This is an excellent way to de-sludge clutch in a painless manner.

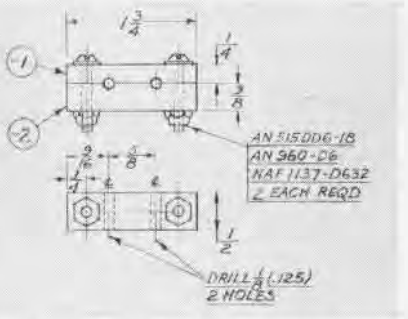
As a further safeguard with Wright clutches, all shifts in flight should be made at not less than 1700 rpm, except in an emergency. In no case should any supercharger (especially a Wright) be shifted at over-rated rpm as failure is almost certain to result. If shifts in flight are made at much less than 1700 rpm with Wright engines, the collapsible ring may not be expanded and the clutch will not shift. Ground shifts at idle rpm cause no harm to the clutch, as the supercharger horsepower absorbed by clutch is negligible.

Cable Rigging Is Improved

Quonset Method Eliminates Sag

A method of rigging the bomb release and arming cables to prevent sagging and contacting a junction box was set out in NAS Quonset Point Model OS2U-3 and Model OS2N-1 Local Change No. 7.

A phenolic fairlead is fabricated in accordance with the accompanying drawing. With the cables in place, the



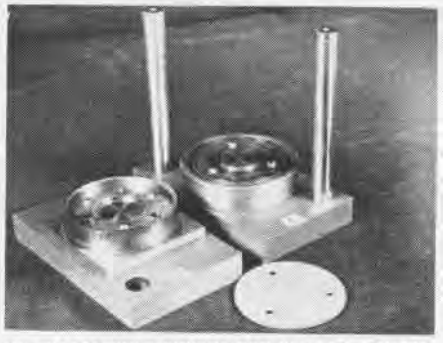
QUONSET RIG SYSTEM HALTS SAG OF CABLE

fairleads are installed approximately seven inches from topside of the port wing and approximately four inches from topside of starboard wing on existing vertical angle, which is located five inches inboard of the outer wing panel. Fairleads are then positioned to insure proper rigging of the cables.

Die Makes N2S Dust Covers

Completes Work in One Operation

NAS Ottumwa—A die which makes dust covers for N2S tail wheels has been developed in the A&R shops. The



DIE MAKES DUST COVERS FOR N2S TAIL WHEELS

die will blank, form the center, flange the sides, pierce and countersink the screw holes, completing the dust cover in one operation. Although it required three days to build the die, a great deal of time has been saved in the manufacture of dust covers.

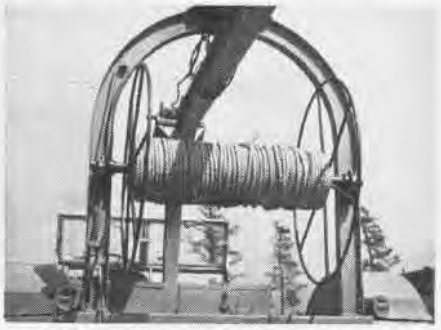
[Designed by J. J. Socha, AMM2/c]

▶ ***BuAER COMMENT***—**A&R Shop has done a fine job in developing this die; however, dust covers are furnished by the manufacturer with the wheel. Bendix wheel No. 55612 is a 1,000 smooth contour for N2S airplanes with fairing part 51184. Bendix also makes 800 SC wheel part 55665 for N2S airplanes with fairing part 51123. Covers and fairings may be ordered by these part numbers from ASO.**

Target Towing Operations

Deviate From the Usual Procedure

CASU 23—In an effort to carry out extensive target towing operations employing manila tow line with maximum efficiency, this unit has developed sev-



REEL ON TRUCK FACILITATES HANDLING LINES

eral changes from the usual procedure to assist in drag take-offs.

To expedite execution of numerous runway changes, bomb service trucks Mk 2 are equipped with roller bearing brackets. Standby reels may be attached to the trucks quickly and the lines transported to and streamed by the runway to be used. To minimize deterioration of lines from contact with mud and water, to prevent snarling from prop blast, and to facilitate handling, a line of posts is placed by the target take-off runways used most frequently, and tow lines placed in slots.

SLOTS ON POSTS ALONG RUNWAY HOLD LINES

A&R Shop Solves Problem

Grease Pumping Switch Is in Use

NATC Pensacola—A&R propeller overhaul shop experienced some operating difficulty when electrically powered pressure greasing units were substituted for compressed air units previously used in filling housings of hydromatic variable pitch propellers.

Air-powered units stalled when the housing was filled, thus giving a positive signal to the operator at that point.

The electrically powered units continued to pump grease without change of pace, putting excessive pressures on the propellers and pumping excessive amounts of grease.

To correct this condition, a compact pressure switch was designed which stops the electric unit when the critical point is reached and which automatically resets unit for the next operation.

▶ *BuAER COMMENT*—The compact pressure switch on the electric lubricator seems to be an effective way to prevent excessive grease pressure and consequent damage to the hydromatic propeller system. Any stations desiring to use such a switch should manufacture it locally.

Ground Plug Discontinued

Automatic Plug Caused Trouble

Originally all naval airplanes used an automatic grounding plug (AN-3106-18-2s) between the engine and the ignition switch. This plug was intended to ground the magneto automatically whenever the ignition circuit was broken, in order to prevent accidental firing of the engine.

Several airplane crashes were attributed to faulty operation of the plug mechanism grounding the magnetos during takeoff. Examination of plugs in stock indicated that many were defective, and immediately instructions were issued to the service to rework all plugs already installed, and also those in stock until a non-automatic plug could be procured. These instructions were:

1. Examine the mechanisms and remove any loose slivers of metal
2. Slip a small piece of Irvolyte tubing over the socket grounding contact

As it was believed inadvisable to redesign or modify the automatic type, replacement of all AN-3106-18-2s automatic plugs with standard AN-3106-18-22s plugs in delivered aircraft was directed by Technical Order 83-43. Contract changes were made with all airplane manufacturers for airplanes under procurement. It is not necessary to replace the receptacle as it mates with either the -22s or -2s plug. Further instructions in Technical Order 121-43 cover the necessity for insuring that the plug is firmly attached to the receptacle before any work is done which might fire the engine, inasmuch as separation of the connector is equivalent to putting the ignition switch in the "Both" position.

All activities are cautioned to check the ignition connectors since any AN-3106-18-2s plug not reworked or examined for slivers of metal is a potential hazard. All of the automatic type plugs should be replaced with standard AN spark plugs as soon as it is practicable.

SHADOWGRAPH IS TRAINING AID

BuAer's Special Devices Division has designed a shadowgraph to project slides and silhouettes of planes and ships for recognition training. Portable, easy to build and collapsible, the shadowgraph can be used without darkening the room or impairing ventilation.

Designated Device 5-AF, it can be used with the 2 x 2 slide projector or the flash projector, Device 5-PP. The projectors are employed as light sources for projecting silhouettes, as well as for regular slide projection. However, an ordinary light bulb fitted with a cardboard shade will produce the necessary light for a satisfactory silhouette.

When the curtain is in place to hood the screen, images can be seen clearly in a lighted room. The instructor, standing beside the device and facing his class, manipulates the models, pointing out recognition features or calling for identification. The calibrated turntable, on shelf behind screen, enables the instructor to present the model ships at precise target angles.

The two basic units of the shadowgraph, screen and mirror, can be set up on one or two table tops, depending upon the space available, size image desired and type projector used. Projector is positioned so that its rays strike the mirror and are reflected horizontally to the screen at shelf level. If the rays are horizontal and parallel to the surface of the shelf, perfect silhouettes will result regardless of the angle to which a model ship might be turned.

Different types of handles or fixtures to hold the plane models may be developed to suit the needs of the instructor. A wood screw, brazed or welded to the end of a rod, is often helpful in securing model to fixture. By inserting screw in hole in model and giving plane a turn or so, plane will be held firmly, yet may be detached easily.

Naval Aviation Training Bulletin No. 194, issued by the Office of the Chief of Naval Operations, shows drawings and provides instructions prepared by BuAer's Special Devices Division for building the shadowgraph locally. The device itself is not available on order.

Students get plenty of light and fresh air when shadowgraph is used, as room does not have to be darkened or closed up

Projectors are used as light sources, but an ordinary light bulb fitted with cardboard shade will produce necessary illumination

Hydraulic Test Unit Made

Air Compressor Is Newest Feature

MCAS EL CENTRO—A hydraulic test unit has been devised by the group service squadron. This unit is 5′ long, 2½′ wide, and 5′ from the ground to the top of the panel. It is mounted on two wheels having an over-all diameter (tire and wheel) of 16″, and two small wheels on swivels, one at each end.

The unit is gas operated, having a four-cylinder gasoline engine for the hydraulic pressure pump, and a one-cylinder gasoline engine for the air compressor. The hydraulic pump is located so that it may be removed to mount another pump in its place for testing purposes.

Shaft Has A Tachometer Connection

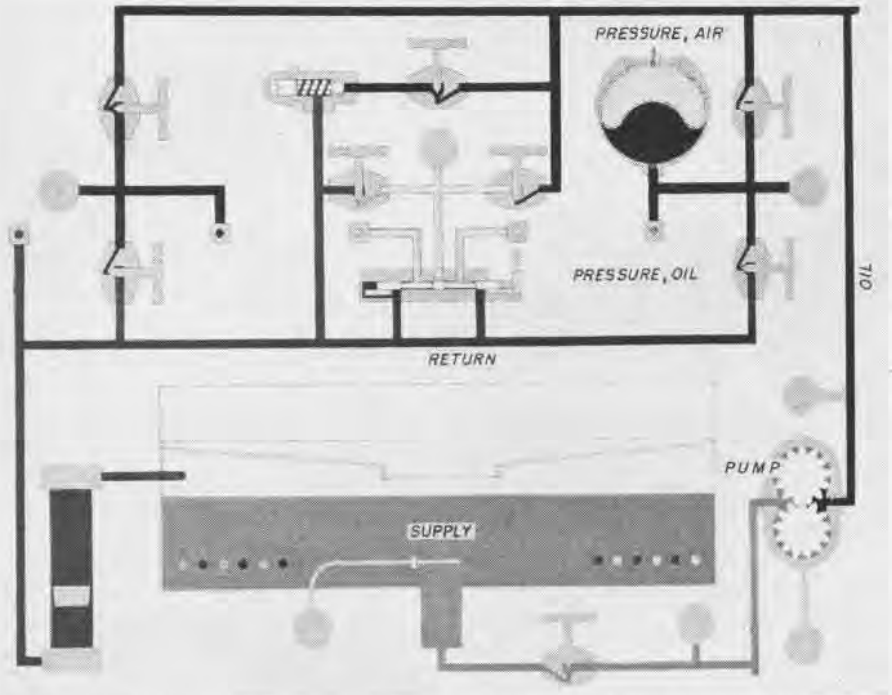
The pump mounting is made for several types of adapters for different kinds of pumps. There also is a gear arrangement between the gasoline engine (four cylinder) and the pump to raise the rpm or to reverse the direction of rotation of the pump shaft. The pump adapter shaft has a tachometer drive connection so that the rpm of the pump may be recorded by a tachometer. A valve is located in the feed line to restrict the flow of fluid to the pump. A suction gauge, located on the panel, is teed between the valve and pump to check the suction of the pump. There are two temperature bulbs. One is located in the pressure line to record the oil temperature coming from the pump and the other is located in the fluid supply tank to record the oil going to the pump. Both temperature gauges are located on the panel.

The pressure manifold block supplies three separate systems. The first system is for hydrostatic tests, the second for cylinder operation tests (this system employs a selector valve), and the third for unloader valve and regulator tests (this system is equipped with an accumulator).

There is also a main relief valve in the pressure manifold. This valve can be cut out by closing a valve in the pressure line leading to the relief valve. All three systems return into a return manifold. The return line from the manifold goes to a flow meter which records the gpm flowing through the bench. A separate outlet in the sink provides a means of by-passing the entire return system except for the flow meter. This allows a means of checking the flow through unit under test.

There are three hydraulic pressure gauges of 5,000 lbs. located on the panel. One is for each system.

The return line from the flow meter goes to the reservoir. There are three filters in the reservoir; one for the oil draining from the sink, one for the return line (this one is very large and is arranged so that most of the air is removed from the oil, if any exists, as it enters the supply tank), and one for the feed line.



DRAWING SHOWS CIRCULATION OF FLUID THROUGH HYDRAULIC TEST SET. UNIT HAS COMPRESSOR

Three Pressure Gauges Are on Panel

The air compressor fills a large pressure tank which supplies air for the booster pump which charges accumulators and shock struts. The air compressor is also for the refrigerating system for the hydraulic reservoir. The reservoir also has a heating unit.

The exhaust from the four-cylinder gasoline engine is split, one pipe leading through the muffler and the other pipe going into a radiator filled with water. By controlling a butterfly valve in the split of the exhaust, the water may be heated or left at normal temperatures. The over-all weight of the hydraulic test unit is about a ton.

▸*BuAER COMMENT*—This test stand has incorporated features which now are being included in new procurement of hydraulic test stands. The air compressor is an added feature which adds to the usefulness of the unit.

Shop Store Has New Plan

System Streamlines Parts Storage

NAS BANANA RIVER—A new type of shop store has been set up here to issue Wright 2600 and Pratt & Whitney 2800 engine parts and accessories, eliminating the usual duplication of stocking and movement of parts twice after coming on the station. The system also eliminates sudden depletion of stock.

Since A&R storerooms are quite large it was felt they could contain all parts required by A&R. Supply would also stock and operate this aviation supply store, streamlining stock control if the material drawn was posted daily.

To do this, issues are made on the original and one copy of a memo stub prepared by aviation mechanics. The storekeeper, when issuing material, keeps a copy of this stub and gives the original to a typist. The typist then makes out an A&R stub from the memo and twice daily the stubs are sent to supply, posted, and when necessary, procurement initiated. The system is regarded as an improvement over the more common type of shop store set-up.

▸*BuAER COMMENT*—This procedure is considered excellent for stocks to be used by A&R Department provided sufficient room is available to permit carrying sufficient stocks, because it eliminates duplication of handling and records, as well as reducing the delay and paper work involved when parts needed immediately have to be requisitioned from supply. Many stations such as San Diego, where only approximately 18 percent of parts moving through supply are used in A&R shops, serve as redistribution centers and A&R should not be burdened with this material.

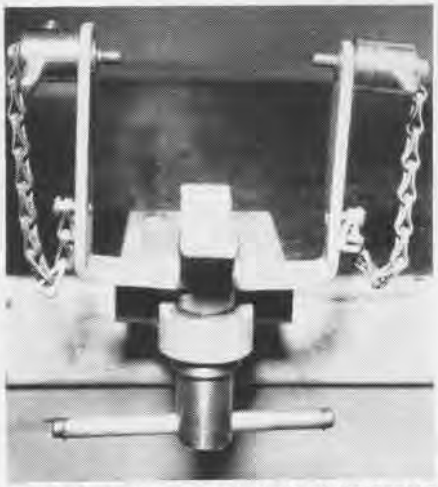
Fixture Aids Repair Work

Device Holds Complete Magneto

NAS NORMAN—A magneto-holding fixture has been developed at this station by an aviation machinist's mate. The advantage of the fixture is that the complete magneto, less the coil cover strap, can be placed in the instrument.

[DESIGNED BY C. N. SELDEN, AMM1c]

▸ ***BuAER COMMENT*—Two suggestions to improve this would be: *1.* A piece of fiber such as brake lining be used on the base so as not to damage the housing. *2.* A positive method of locking the spindle in any position so it will not turn when tightening or loosening various screws.**



FIXTURE HOLDS MAGNETO UNDERGOING REPAIR

Instrument Shop Is Roomy

Seattle A&R Gets New Quarters

NAS SEATTLE—The A&R Department has a newly completed instrument shop, housed in an air-conditioned addition and equipped to repair all types of instruments, including aircraft, photographic, gun cameras, electrical and aviation optical equipment.

The shop has fluorescent lighting and provides 50 percent more floor space for its 69 workers, which includes 41 civilians, 21 enlisted men and 7 WAVES. The new test benches, designed by two men in the shop, make it possible for each worker to have his own bench.

SEATTLE A&R GETS A NEW INSTRUMENT SHOP

Chutes Collect Cartridges

Saves Time in Picking Up Brass

NAS JACKSONVILLE—A chief at Yellow Water gunnery range has constructed a device to transmit empty cartridge cases and links direct from the gun to the packing boxes, without strewing them all over the landscape.

CARTRIDGES CLUTTER UP MACHINE GUN MOUNT

For the links there is a circular screen made of heavy wire which funnels down to a square wooden pipe. The top of the funnel, about 2 ft. in diameter, is secured to the gun. The bottom of the pipe empties into a packing box on the deck below the stand.

For expended brass cases there is a funnel directly under the breech about 6″ x 9″ at the top, also emptying into a square wooden pipe which sends empties into another packing box. It is estimated that approximately 15 minutes are saved on each stand out of every hour by use of this simple device.

[DEVELOPED BY CHIEF KENNETH BRIEGEL.]

WOOD CHUTES GATHER LOOSE CASES AND CLIPS

PHOTOGRAPHY

Forward Photographs and Negatives

A Construction Battalion in the South Pacific forwarded a set of approximately 50 photographs showing construction of an advance base. The photographs were of excellent quality and well captioned. Because of their excellence there was a wide demand for duplicates to be furnished various bureaus of the Navy Departments.

Since no negatives were received in the original shipment it was necessary to copy more than half of the photographs. All negatives were received a week later.

BuAer Manual Section 2, paragraph 8-209 (*e*), covers the point that the first shipment should include the negative and one print, subsequent shipment to include one print.

Seabee photographers are in position to make a good pictorial history of advance base operations. More shipments of such photographs are invited.

Two Heating Units for Aerial Film Dryer

Numerous complaints have reached BuAer indicating that the Model J aerial film dryers, 18-D-796 and 18-D-797, were not entirely satisfactory.

To alleviate the major difficulty encountered, heating units have been procured and now are available at the various photographic supply depots. Two units are available, one for the AC and one for the DC dryer. The former should be ordered under stock No. 18-H-348-300, and the latter under 18-H-348-350.

The units are designed so that they may be used without alterations to dryer.

A Camera Adjustment Improves Photos

Several field reports have pointed out complaints of the K-20 camera shooting fuzzy pictures. This, in all cases, was caused by the shutter tripping before the piston had traveled to the top of the cylinder where sufficient suction holds the film in a flat plane.

The cure: adjust the shutter trip link so that the camera will trip at the proper time in the cycle.

Reports again emphasize that perhaps 90 percent of camera failures are caused by improper maintenance. Units that clean and inspect cameras after each mission, store them properly, have little trouble.

Summary of Reconnaissance Photography

Naval Aviation *Confidential Bulletin* No. 6-44, dated June 1944, carries an article containing a brief summary of photographic reconnaissance as employed in the Navy since the start of the present war. The article also deals with a standard fixed installation in one type of photographic airplane where cameras are operated by remote control.

Photographic officers concerned with reconnaissance photography should see that this article is brought to the attention of pilots, photo interpreters and photographer's mates with their respective units.

How to Jettison a Turret

PB4Y Gets Back Safe from Saipan

A Navy photographic plane came back from a mission over Saipan recently after battling through 15 attacking *Zekes* which swarmed in when one of of the PB4Y's engines cut out. One of the main reasons it got back, however, was that the crew had worked out carefully the procedure for lightening the load by jettisoning the ball turret.

The *Zekes* attacked the plane 30 miles from Tinian on the trip home and continued the fight for 70 miles. Although the point at which the engine cut out was 1,000 miles from its home base, the plane made the grade because of skillful piloting and some active tossing-overboard of all movable gear. Major items included all guns and ammunition, all cameras, armor plating from turrets, all radio equipment except one set—and the ball turret.

Procedure for jettisoning the turret had been worked out carefully in squadron drills ahead of time. By following this procedure, the crew got rid of it in 20 minutes, going through the following steps:

1. Turn off the electric power switch on the overhead and cut all electric wiring

2. With the elevation handle, point guns straight down

3. Disengage azimuth power clutch

4. Disconnect oxygen system and remove oxygen bottle

5. Remove the azimuth gear box by taking off the four holding nuts

6. Remove the eight vertical bearings which are held in place by two bolts. They bear on the scarf ring

7. Place the turret in the fore and aft position

8. Lower the turret and the scarf ring together. This prevents the turret from swaying in the slip stream

9. Using the waist-gunners' safety belts, secure the turret so it will not drop when trunnion nuts are removed. The belts should be secured between the turret A frame and the turret retracting piston

10. Remove the six nuts that secure the turret trunnion housing to the turret retracting assembly

11. All hands stand clear and two men cut the two safety belts at the same time. It is suggested that nuts and bolts to be removed be painted some color other than the color of the turret, so that if an emergency arises they can be spotted immediately

Before the turret and other gear were jettisoned, the plane lost altitude on auto-lean and gradually descended from 20,000 to 6,000 ft. As soon as the turret was dropped the plane was able to maintain its altitude in auto-lean.

(Succeeds List of May 1944)

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

June 27, 1944

Engine	Bulletin	Date
Pratt & Whitney		
R-985	0	6-6-44
R-985	179	6-8-44
R-985	181	5-30-44
R-1340	200	5-11-44
R-1830	298	Revision No. 1 dated 5-16-44
R-1830	352	5-11-44
R-1830	353	6-14-44
R-1830	368	Revision No. 1 dated 6-7-44
R-20000	39	Revision No. 1 dated 6-9-44
R-2000	43	Revision No. 1 dated 5-12-44
R-2000	50	Revision No. 1 dated 6-7-44
R-2000	63	6-13-44
R-2000	66	5—11—44
R-2800	113	Revision No. 1 dated 6-6-44
R-2800	120	Revision No. 1 dated 5-18-44
R-2800	125	5-11-44
R-2800	129	5-17-44
R-2800	135	5-30-44
R-2800	138	5-30-44
R-2800	139	6-5-44
Wright		
R-1820	321	6-15-44
R-1820	350	Supplement No. 1 dated 5-15-44
R-1820	355	5-17-44
R-2600	122	5-17-44
R-2600	130	5-19-44
R-2600	131	6-8-44
R-2600	132	6-15-44
R-3350	none	
Continental		
None	none	
Lycoming		
None	none	
Ranger		
None	none	

General Engine Bulletin	Date
41	Being issued
42	4-19-44
43	5-18-44

Auxiliary Power Plant Bulletins	
6	Supplement No. 1 dated 5-1-44

Propeller Bulletins	Date
Curtiss	
17	Being issued
18	Being issued
19	5-15-44
20	5-12-44
21	5-20-44
22	5-25-44
Hamilton Standard	
18	6-13-44

General Propeller Bulletin	Date
8	4-19-44

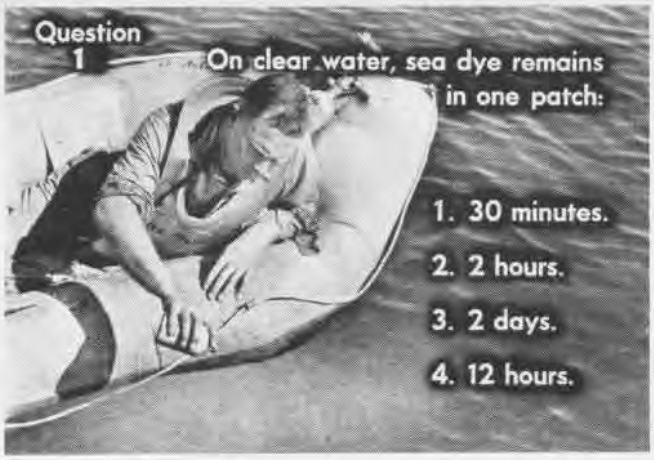
Power Plant Accessories Bulletin s	Date
7	Supplement No. 1 dated 4-19-44
13	Revision No. 1 dated 6-3-44
19	Revision No. 1 dated 5-23-44
20	Revision No. 1 dated 4-17-44
38	5-10-44
42	5-19-44
43	6-9-44
44	6-8-44
45	6-14-44
46	6-10-44
47	6-15-44
48	6-13-44
49	6-14-44
50	6-14-44

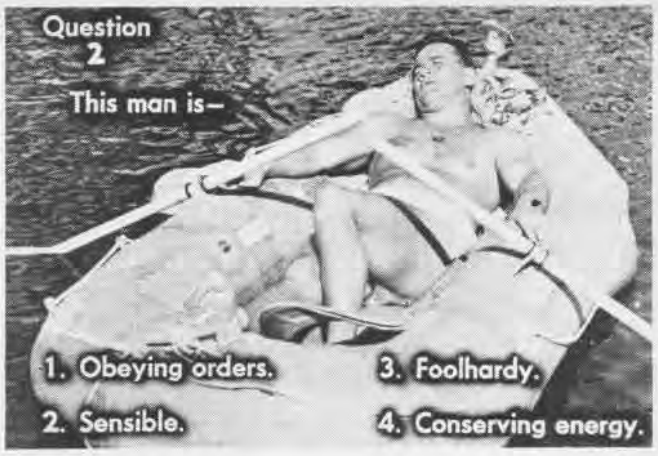
Propeller Position Checked

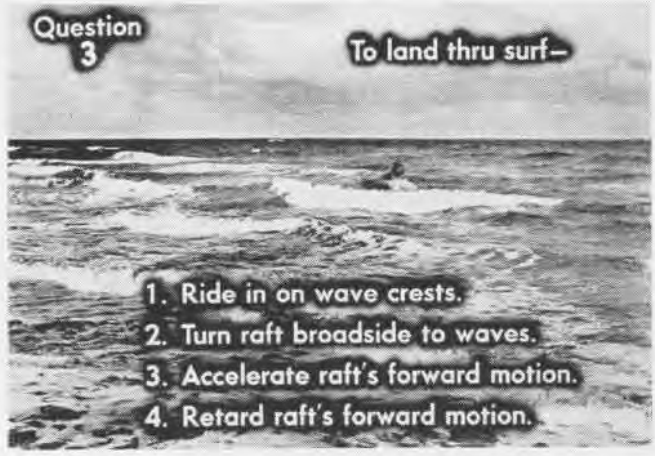
Method Is Simple and Convenient

MCAS ST. THOMAS—A time and labor saving system for checking position of propeller blade for the zero shot of guns on SBD-5s has been devised here. The zero shot mark is painted permanently on the blade. Further accuracy is assured by inserting a sectional cleaning rod in the muzzle. The rod is aligned through a circular wooden block inserted in the blast tube. The set-up is simple and efficient.

▶ ***BuAER COMMENT*—This appears to be a simple and convenient method of locating the propeller blade at the proper zero shot position and can, of course, be used regardless of the type of synchronizer.**







PIX QUIZ WHAT DO YOU KNOW ABOUT

LIFE ON A RAFT?

ONE OF THE toughest obstacles that confronts personnel attempting to survive at sea is fear. If the would-be survivor licks that adversary, maintains a clear head, uses to best advantage the facilities he has available, his chances of coming through are good. That's the dope from the boys who know—and thousands of them have come back to tell about it. These questions are simple, but the answers are important! See p. 40 for the right one.

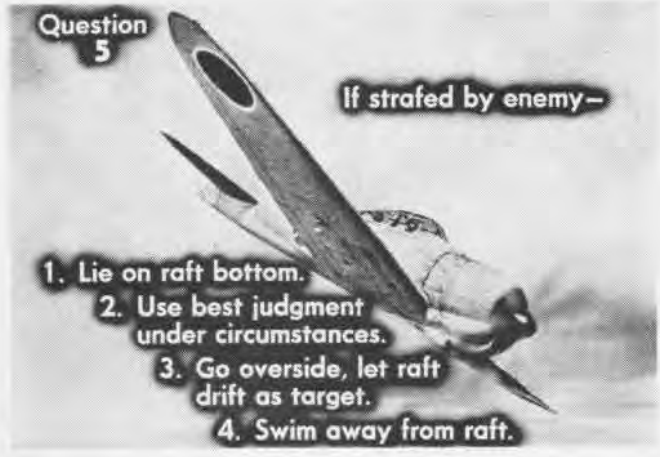
[QUESTIONS FROM VISUAL QUIZ FILM NO. 58, SURVIVORS AT SEA]

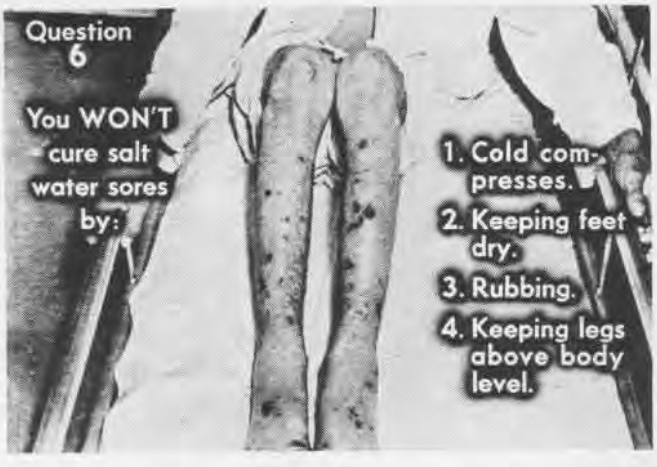
Write your answers here

1. ..... 4. .....

2. ..... 5. .....

3. ..... 6. .....





AVIATION ORDNANCE

INQUIRIES SHOULD BE ADDRESSED TO THE CHIEF OF BUREAU OF ORDNANCE

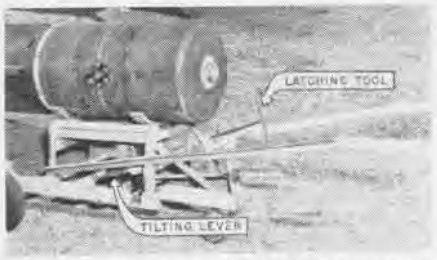
Corrosion and Wear Causing Hang-ups

Information obtained by BuOrd indicates that bomb hang-ups and excessive bomb-release lags are being encountered because of the rough condition of the bomb rack or shackle hooks resulting from constant use or corrosion. Bomb lugs which have become rough or corroded at their suspension (contact) surfaces also contribute to release difficulties.

To keep hang-ups and release lags at a minimum, aviation ordnancemen are advised to inspect carefully the suspension (contact) surfaces of bomb rack and shackle hooks, and of bomb lugs. If any roughness or corrosion is noted, it should be removed by dressing with a suitable abrasive. A thin film of grease (OS 1350) on the contact surfaces of hooks and lugs will further reduce friction and permit more positive release.

Marines Construct Maneuverable Truck

A lightweight, highly maneuverable bomb truck has been designed by personnel of Marine Scouting Squadron 3, utiliz-



RACK HOISTS BOMBS INTO LOADING POSITION

ing an automobile jack for quick positioning of bombs for loading onto wing racks of sub type airplanes. Because of its limited application, the Bureau of Ordnance does not propose to furnish this type of truck but is passing the idea on to enable interested activities to manufacture the device locally if desired. It is believed that some activities might prefer the mechanical lift incorporated in this truck to the manual hoisting methods normally used for loading wing bomb racks.

An automobile jack is welded to the frame of the truck, and supports a cradle in which the bomb is carried. By mounting the cradle on a ⅝" pin running horizontally through the head of the jack in an athwartship direction, it is possible to tilt the cradle to position properly the bomb for loading onto the bomb rack. A lever extending through the side of the truck can be used to control tilting to the proper angle. The single caster wheel at one end of the truck provides excellent maneuverability for final positioning of the bomb as the rack is latched.

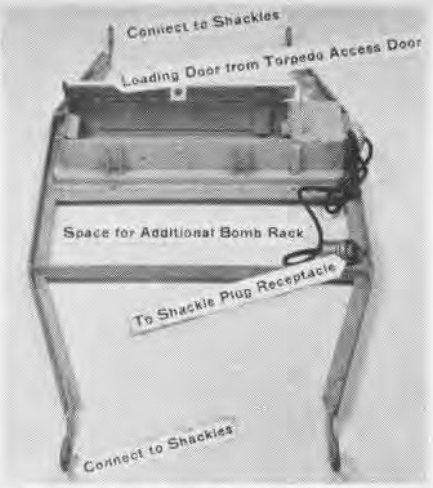
Attention is called to the latching tool shown in the photograph. It is also of local design, and appears to be a convenient means of latching the bomb rack, Mk 50 type, Bureau of Ordnance reports.

Navy Has Version of M10 Chemical Tank

Chemical tanks for use on carrier based aircraft require many features that are not essential for their use on land based airplanes; namely, the loaded tanks must successfully withstand long term storage, salt spray, catapulting, and arrested landing. Ease and simplicity of installation and operation are very desirable features for any type aircraft chemical tank, and these qualities are possessed by the Army's M10 airplane smoke tank.

For this reason, and to expedite production, the castings, dies, and operating principle of the M10 tank were utilized in developing the Mark 10 Mod. O aircraft chemical tank. Differences between the two tanks are tabulated below:

PRINCIPAL ITEMS	SMOKE TANK M10	AIRCRAFT CHEMICAL TANK MARK 10 MOD. 0
Permissible storage of tank loaded and ready for installation	Not over one (1) week; extreme care required in handling in any event two suspension lugs 14" apart; one hoisting lug on each side of tank 45° down from top centerline	At least six (6) months; care required in handling due to tank's thin shell. Two lengthened suspension lugs 14" apart; one center "folding type" lug ass'y, for single hook suspension; forward pin of this ass'y, used for hoisting attachment
Size of area adjacent to each lug reinforced for sway bracing	Early tanks, none; later tanks, approx. 21½" long and 10" wide	Area approximated by scribing semi-circle of 5" radius with center at lug. After sway brace region is extended by an additional semi-circular area of approx. 6½" diam.
Electrical connectors and special wiring	None (detonator leads used through-out)	Short cap wires taped to removable wiring harness having AN receptacle and special "pigtail"
Strength and type of detonators	Commercial No. 4 electric blasting cap	Commercial No. 6 electric blasting cap
Discharge closure and minimum breaking pressure	¼" flat double-strength window glass; about 2 or 3 lbs./in.² or less (Gage used not sensitive enough to register)	⅜" dish-form pyrex glass; about 125 lbs./in.²
Air inlet closure and minimum breaking pressure	¼" flat double-strength window glass; about 25 or 35 lbs./in.² *estimated*	⅜ flat tempered glass; about 500 lbs./in.²
Type of gaskets and chemical resistance	Neoprene impregnated asbestos; fair	TFE (tetrafluoroethylene) Polymer; completely resistant
Gasket sealing aid	Graphite Grease	None needed or desired
Hydrostatic pressure test withstood by each tank without evidence of leaks or distortion	15 lbs./in.² pressure; applied through air inlet with metal seal substituted for glass discharge closure	75 lb./in.² pressure; applied through air inlet with regular glass closure installed in discharge pipe
Type of weld holding top and bottom halves of tank	Seam weld (No leaks at 15 lbs./in.² but leaks at 25 lbs./in.² pressure)	Reinforced butt weld (No leaks at 105 lbs./in.² pressure
Added Protection for glass closures during storage of tank	None	Air inlet and discharge pipes provided with removable metal covers
Tank color	Olive drab	Ocean gray



ADAPTER ALLOWS BOMB LOADING IN FLIGHT

Station Adapts Bomb Rack

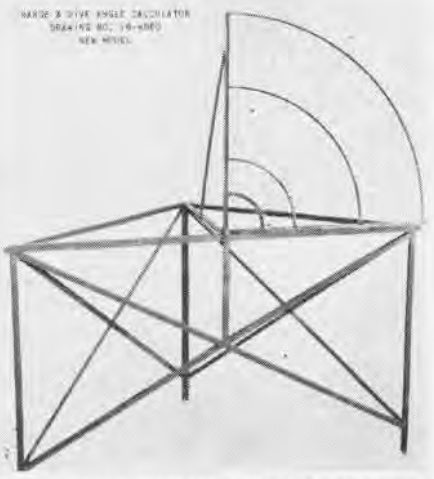
Adapter Is Loaded During Flight

An adapter for Mark 46 bomb rack for TBF and TBM airplanes has been developed at NAS Alameda. The adapter is supported by shackles at stations 7 and 8. One of the features of this installation is that the rack is capable of being loaded in flight through the torpedo access door. The adapter is shown in the accompanying photograph.

Device Helps Dive-Bombers

Diving Angle Calculated Quickly

This dive angle indicator was developed by personnel of Comfair West Coast from various models of the *Harp* previously in use. The device is currently being used by Comfair West Coast activities for calculating dive angles in connection with rocket firing training. By swinging the wire section through 90°, both right and left dives can be checked. This device can be easily manufactured locally. A blue print may be obtained by contacting NAS San Diego and requesting their station print number 15-4878 entitled *Stand-Range & Dive Angle Calculator.*



DIVING ANGLE INDICATOR USED AT SAN DIEGO

Device Measures Prop Bend

Saves Hours in Checking Blade

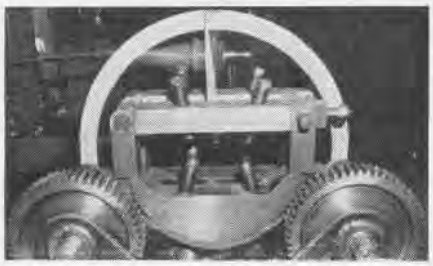
NAS SEATTLE—Use of a 180° protractor and indicator to measure bend of a propeller blade after twisting in the angling machine has proved satisfactory to this activity.

The protractor is made from ¼" sheet iron and is attached at either end of the semi-circle to the stationary part of the machine. The indicator needle also is made of ¼" sheet iron and is attached to the movable part of the machine.

The advantage of this simple device is that it eliminates necessity of disassembling the blade angling machine for a check after each operation. It saves approximately 1½ man-hours on each blade and gives an accurate estimate of the amount of correction on each check. The machine is graded in tenths of degrees.

[DEVELOPED BY DON E. MILLER]

▶ ***BuAER COMMENT*—This idea will help to determine twists on blades. The twisting machine however has a great deal of "play" which, coupled with residual twists in the blade, would tend toward inaccuracy. After continuous use by one operator**



it should be a very satisfactory rough guide, improving along with individual technique and experience.

Electrical Manual Is Issued

Is Last Word on Test Equipment

Maintenance personnel of the Fleet and shore stations will have, within the next few weeks, a complete manual of all test equipment being procured by BuAer for maintenance of radio, radar, IFF, electrical and associated electronic equipment used in naval aircraft.

The *Manual of Test Equipment for Airborne Electrical and Electronic Equipment*, NavAer 08-58-78, now is being printed and will be ready for distribution about August 15, to all activities which now receive the *Airborne Radar Maintenance Bulletin* and *Airborne Radio Maintenance Notes*.

Descriptions of approximately 200 test equipments appear in the book, which is illustrated with nearly 100 photographs. So that the compilation may be kept up-to-date as new equipment is added or old sets become obsolete, the book will be bound in loose-leaf form and periodic revisions issued.

Descriptions appear in seven sections separated by index tabs for ready reference: POWER SUPPLIES, GENERAL TEST EQUIPMENT, RADAR TEST EQUIPMENT (general and by frequency bands), IFF TEST EQUIPMENT, TESTING DEVICES FOR SPECIAL SYSTEMS, MISCELLANEOUS and LABORATORY TEST EQUIPMENT.

In addition to the descriptions and photographs of test equipments, the manual will contain an introductory section of general information. It will include lists of recommended test equipment, the BuAer test equipment plan, BuAer circular letter 28-44 regarding distribution and means of obtaining test equipment, and a list of batteries used with various test equipment.

The table of contents is a complete list of all test equipment being procured by BuAer. Not every equipment so listed is described since some of the models are so new that complete data cannot be obtained, but revisions of the book will fill omissions when available.

(Succeeds list of Mar. 20, 1944) **July 1, 1944**

NUMBER AND DATE OF ISSUE OF LAST SERVICE AND OBSOLESCENT AIRPLANE BULLETINS AND CHANGES

(Contract changes not included)

Airplane	Bulletin	Date	Change	Date
F4F-7	13	11-29-43	40	11-30-43
F6F-3	43	5-12-44	62	5-3-44
FM-1	25	6-6-44	52	6-5-44
FM-2	14	6-5-44	16	6-5-44
F4U-F3A-FG	66	6-10-44	157	6-13-44
GH-1	7	11-15-43	19	5-31-44
J2F-5	13	8-17-43	16	3-27-44
J2F-6	1	2-25-44	4	4-10-44
NH-1	0	.....	10	5-31-44
N2S-3	23	6-13-44	30	3-23-44
N2S-4	14	6-13-44	11	5-23-44
N2S-5	6	6-13-44	9	5-23-44
OS2N-1	31	5-19-44	33	3-3-44
OS2U-3	56	5-19-44	63	3-3-44
PV-1	54	6-6-44	140	6-1-44
PV-3	12	5-2-44	13	3-29-44
PBJ-1	22	6-9-44	41	6-8-44
PBM-3D	9	6-7-44	26	6-2-44
PBM-3R	38	5-25-44	124	6-2-44
PBM-3S	17	5-19-44	68	6-9-44
PBN-1	3	4-12-44	41	5-23-44
PBY-5	50	6-6-44	160	6-13-44
PBY-5A	62	6-6-44	151	6-13-44
PBY-5B	12	6-6-44	36	3-13-44
PB2Y-3	37	6-13-44	140	6-13-44
PB2Y-3R	39	6-13-44	123	6-13-44
PB4Y-1	61	6-13-44	95	6-9-44
PE2B-1	3	4-24-44	2	6-3-44
R4D-1	24	6-12-44	28	6-6-44
R4D-2	10	6-12-44	3	1-6-44
R4D-3	16	6-12-44	16	5-2-44
R4D-4	11	6-12-44	3	2-21-44
R4D-5	16	6-3-44	16	6-6-44
R5C-1	12	3-19-44	74	6-5-44
R5D-1	18	5-25-44	71	6-1-44
R5O-5	11	3-31-44	12	6-9-44
RY-1	20	6-24-44	11	6-10-44
RY-2	5	6-13-44	1	5-24-44
SBD-3	85	6-12-44	154	5-27-44
SBD-4	40	6-12-44	66	5-30-44
SBD-5	46	6-12-44	68	5-30-44
SBD-6	11	6-12-44	11	5-30-44
SB2C-1	48	6-7-44	78	6-13-44
SB2C-1C	36	6-7-44	80	6-7-44
SB2C-1A	5	6-5-44	4	6-9-44
SB2C-3	21	6-7-44	22	5-10-44
SBF-1	15	6-7-44	8	6-5-44
SBF-3	6	6-7-44	3	6-5-44
SBW-1	13	6-7-44	27	6-14-44
SBW-3	7	6-7-44	15	6-10-44
SNB-1	17	6-13-44	20	3-10-44
SNB-2	14	6-13-44	14	6-5-44
SNB-2C	6	6-13-44	6	6-5-44
SBJ-3	27	3-1-44	26	3-29-44
SNJ-4	23	5-18-44	26	3-29-44
SNJ-5	7	3-1-44	8	5-29-44
SNV-1	19	6-7-44	51	5-22-44
SNV-2	4	6-7-44	5	5-22-44
TBF-TBM	105	6-14-44	193	6-5-44

LETTERS

SIRS:

On page 17 of the May 1 issue of your publication is an article on the Air Bombers Training Unit at Banana River, Fla. In discussing the trainees, the article states ". . . while officers are gunnery training and intermediate training graduates."

Inasmuch as I am a graduate of the Aviation Gunnery Officers' School of Jacksonville, I am wondering if I am eligible for this training. Will you please advise me of the school's entrance requirements.

LIEUTENANT, USNR, FAW 8

¶ NAOTC advises that at the present time a limited number of A-V(S) officers are being given the three months' bombardier course and upon completion are being assigned as instructors and maintenance officers for the 7-A-3 bombing trainer. Backgrounds of ordnance, mathematics, physics and basic navigation are very helpful. All requests for assignment to this course should be sent to BuPers via commanding officers.

SIRS:

A recent exchange of letters of mutual appreciation and commendation between U.S. Army and U.S. Navy commands located in England, proves undoubtedly that the rivalry of the Army mule and Navy goat on the gridiron becomes a fallacy in wartime on the scene of action.

In their letters, the U.S. Navy antisubmarine aviation units in England express their great appreciation for the complete cooperation and essential services rendered by U. S. Army commands during the usual trials and tribulations of the shake-down period and also during subsequent daily operations. They also commend the assistance by Army units to Navy aircrews on occasions of crash landings, on necessary flight diversions, in the housing and messing of transients and by assisting in obtaining essential spare parts.

The Navy air commands have had the opportunity to reciprocate these services and have received similar letters of appreciation from Army units. The exchange of these letters is indicative of the spirit of cooperation and determination in our two services toward a final victory.

COMMANDER, FAW 7

SIRS:

Experience in flying TBF's in the South Pacific has brought to light two practices for improving navigation facilities on the plane. One is an improvement on the plotting board. The snap button to keep it together is practically useless. The board and its plastic cover warp and, being too strong for the snap, the disc comes out.

It has been a practice to remove the snap and put in a nut and bolt, which requires that one drill out the snap. It would be simpler if the Mk 3 plotting board was made that way to begin with.

The other suggestion is in the storage of the Mk 8 computer which fits in an inside drawer of the plotting board. When the board is in the plane it is at such an angle that the computer is hard to get at. We took out the drawer and riveted the computer to the bottom right hand corner of the plastic top of the board where there is ample room for it. Some boards have a Mk 8 computer made of celluloid-type material. This warps so badly the two scales are nowhere near each other and have to be replaced by metal Mk 8's.

CAPTAIN, USMC

¶ No reports of unsatisfactory material or workmanship have been received by BuAer on this (Mk 5 88-B-635 and 88-B-640) chart-plotting board. A RUDM complete with photographs would enable BuAer to correct defects with minimum delay. Location of Mk 8 computer on board is being considered.

CONTENTS

PUBLISHED TWICE MONTHLY BY AVIATION TRAINING DIVISION, OFFICE OF CHIEF OF NAVAL OPERATIONS AND BUREAU OF AERONAUTICS, NAVY DEPARTMENT—NO. 222

ANSWERS TO QUIZZES

• NAVIGATION PROBLEM (on page 16)

1. Cus 173½° Speed 34k
2. 286°
3. 174°
4. 112°
5. 0611½
6. 0700
7. Lat. 06°58' S Long. 154°11' E

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

• BEST ANSWERS (on page 28)

1.a 2.a 3.d 4.c 5.b 6.c 7.c

• PIX QUIZ (on page 37)

1.2 2.3 3.4 4.4 5.2 6.3

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

PUBLICATIONS

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

AVIATION CIRCULAR LETTERS

48-44 *Aircraft Accident Reports.*
49-44 *Wading Suits—Availability of Materials for Repairing of.*
50-44 *Aircraft Safety.*
51-44 *Clearance and Briefing of Naval Aircraft Departing from the U. S. and Proceeding to Destinations beyond the Continental Limits of the U. S.*
52-44 *Pressure Sensitive Tapes, Procurement and Storage of.*
53-44 *Airframe Spare Parts for Combat Type Aircraft—Procurement of.*
54-44 *Aircraft Reconditioning and Aircraft Engine Overhaul—Distribution of.*
55-44 *Special Airplane Ground Handling Equipment—Provisioning and Allocation of.*
56-44 *Maintenance of Transient Aircraft.*
57-44 *Use of Arabic Numerals for Designating Material Under the Cognizance of the Bureau of Aeronautics.*

TECHNICAL NOTES

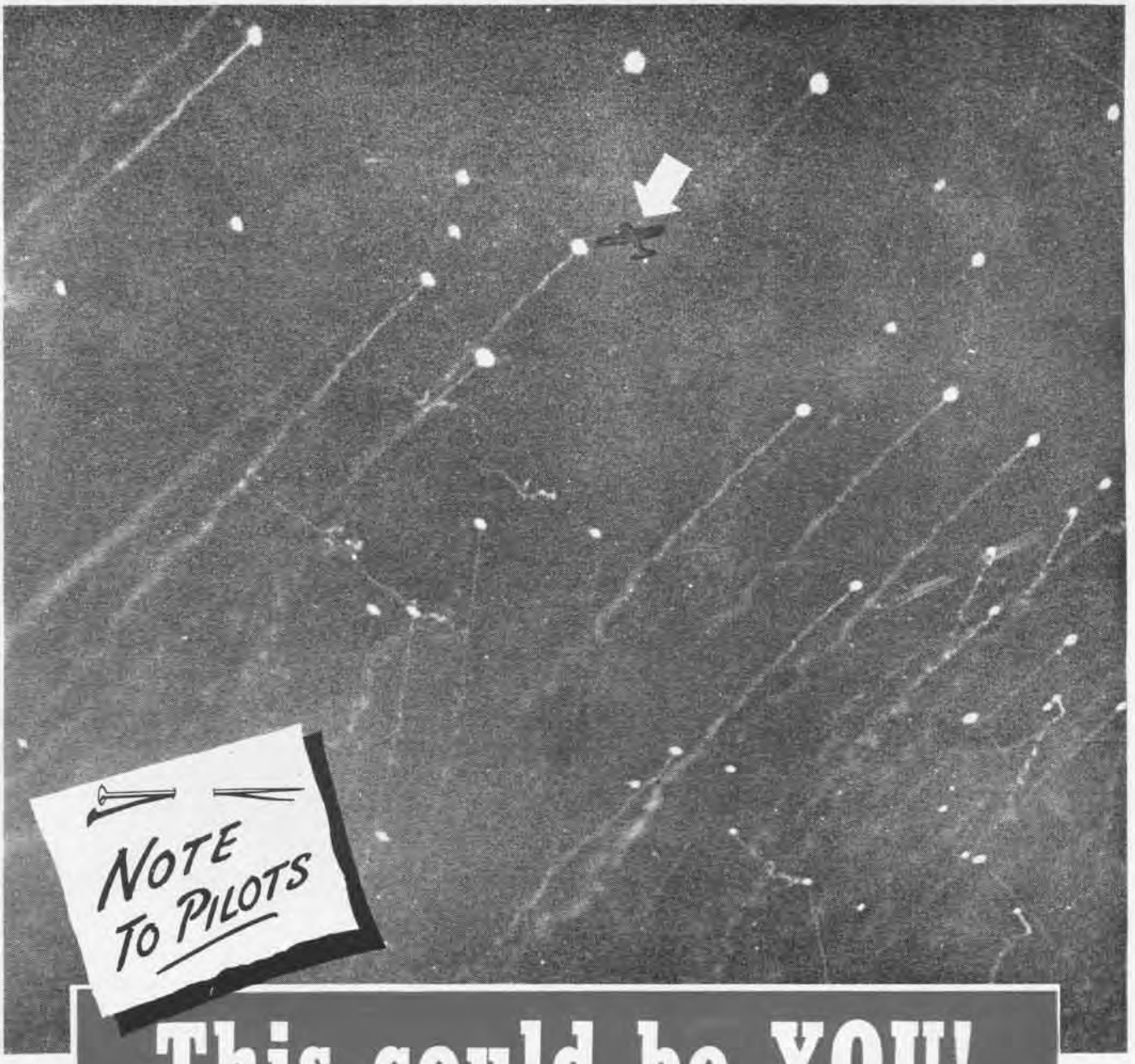
A-44 (Conf.) *Model AN/ARC-4(233A) Equipment—Tuning Procedure for new Frequency Combinations.*
45-44 *Bearing and Brush Modification in Eclipse Type NEA-2, NEA-2B, NEA-2D, NEA-2E and NEA-2F Generators.*
46-44 *Type 2CM70B2, 2CM70B2A, 2CM70B5, 2CM70B5A, 2CM70B5B and 2CM70B9 Generators, Increased Rating and Interchangeability of.*
47-44 *Service Weight and Balance Control System—Loading Data and Load Adjusters.*
48-44 *Aircraft Radio—R-4/ARR-2 and *R-3/ARR-2 X Mechanical Linkage Sleeve.*
49-44 *Modification of Eclipse Type E-5A and E-7A Generators.*
50-44 *AN/APS-3 Method of Cable Fabrication.*
51-44 *Drinking Water Kit—Desalting; Chemical.*
52-44 *Conversion of Jack & Heintz Engine Starters JH-3, -3C, -3D and -3AD.*
53-44 *Windshield Fogging, Prevention of by Proper Use of Heating System.*
54-44 *Model F4U Type Airplane Spin Recovery Characteristics.*

TECHNICAL ORDERS

69-44 *Self-Sealing Fuel Tanks—Obsolete Construction—Withdrawal from Service Use.*
70-44 *IFF Destructor Firing Circuits, Testing for Voltage on.*
71-44 *War Emergency Power Operation.*
72-44 *Oxygen Equipment—Diluter-Demand System—Modification and Standardization of.*
73-44 *Removal of Oil Dilution Systems.*
74-44 *Model JM-1 Airplanes Restrictions and Permissible Maneuvers.*
75-44 *Oxygen Flow Indicator—Piston Seal—Procedure for Replacement of.*
76-44 *Oars, Plastic or Plywood—Removal of from Pneumatic Life Rafts.*
77-44 *Modification of P-1 Generators.*
78-44 *Model SNB-1 Airplanes Restrictions and Permissible Maneuvers.*
79-44 *Model PV-1 Airplanes Restrictions and Permissible Maneuvers.*
80-44 *Idle Mixture Adjustment—Standard Procedure for Checking.*
81-44 *Elastic Shock Cord, Exerciser Cord, and Bungee Rings—Deterioration of.*
82-44 *Modification of AAF Voltage Regulator Base and Wiring Thereto.*
83-44 *Mildewproofing of Doped Fabric Surfaces.*
84-44 *Model GB-1, -2 Airplanes Restrictions and Permissible Maneuvers.*
85-44 *Model PBY-1, -2, -3, -4, -5 and PBZ-1 Airplanes Restrictions and Permissible Maneuvers.*
86-44 *Preparation of Damaged Model SNB and JRB Airplanes for Rail Shipment.*
87-44 *Bearings, Aircraft Anti-Friction, Reconditioning and Reuse of.*

FLIGHT SAFETY BULLETINS

21-44 *Increase of Stalling Speed in Turns.*
22-44 *PB4Y-1 Weight Limitations.*
23-44 *Altimeter Setting on Civil Airways in Continental U. S.*



This could be YOU!

GO AHEAD! Fly over one of our ships without identifying. Test the crew's quickness on recognition . . . if you want that plane you're flying punctured like a hunk of swiss cheese! Then, should you live to add up the count—*you undoubtedly won't!*—you can flatter the AA crews on how accurate their lead is!

But it's saner, and safer, to identify. Remember, AA crews are plenty tough and trained to shoot. If you approach Allied ships and leave them doubtful as to whether you're friend or foe, they won't ask too many questions, wait too long. . . .

Don't expect crews to take chances. They've had ships blown from under them, seen shipmates machine-gunned to death because they were slow to act. And most of the unfortunate cases where friendly planes were shot out of the sky were the fault of pilots who failed to identify their planes as *friendly*.

▶ So don't *you* take chances. Ships will challenge, but don't wait. It's the pilot's responsibility to identify first.

▶ Ships will recognize, but don't stake your social security on it. They may not be sure, there may be clouds, enemy planes, . . .

In the final analysis, it's that ship and its big complement against your plane and lonely little you. You're valuable, but you know which counts more with the Fleet!

▶ The same thing holds true for shore gun positions. Remember the rules . . . heed 'em!

Identify

WHEN APPROACHING ALLIED SHIPS!

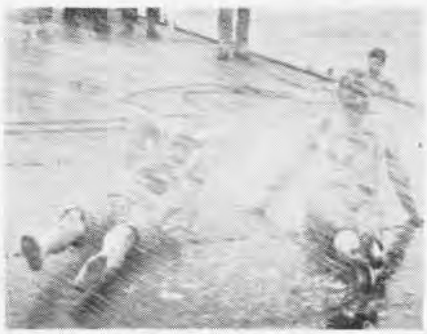
RECOMMENDED READING: (1) Recognition and Identification Sense (2) Identity . . . . or Else! reprint from NAVAL AVIATION NEWS

SCENE FROM NEPTUNE PARTY WHICH CARRIED OVER SECOND DAY SHOWS FRIENDLY RIVALRY BETWEEN SHELLBACKS AND POLLYWOGS WHO FOUGHT BACK

MUTINY among the POLLYWOGS

IT WAS all in fun, but the hoary traditions of King Neptune recently were flaunted, with temporary success, by rebellious Pollywogs aboard a U.S. carrier. The Pollywogs (novices), realizing their numerical superiority over the Shellbacks (veterans), held a Kangaroo Court and united in resistance to the usual pommeling the Shellbacks were doling out, returning blow for blow in the ceremony prepared for all novices crossing the Equator.

POLLYWOG NOSES PERFORMED PEANUT RACE



TORPEDO COMMANDER SHELLBACK GOT WET

The Neptune party stretched over two days. Toward the end of the first, the Pollywogs held their council and, on the second day, mutinied.

Order finally was restored and the Pollywogs were brought into line and administered all indoctrination due them: *running the gantlet, peanut races, three-legged races, hair trims, ducking,* etc. When these were over, the Pollywogs were initiated into the order as Trusty Shellbacks and each given his *Imperium Neptuni Regis* certificate. The NANews correspondent aboard was initiated along with the other Pollywogs.