

NAVAL AVIATION

NEWS



Naval Air Technicians
The Okinawa Invasion

June 15, 1945



Send an SOS!



CHARLES PYLES, JR., ARM2c, picked up the radio message . . . "American pilot shot down over Okinawa . . . drifting in small wooden boat near shore. . . . Attempt to rescue. . . ."

American ships were bombarding the beaches—searching the area was hazardous, but the OS2U swooped down dodging the fire. They spotted the man stranded on a coral reef, frantically waving his white scarf to attract attention. Pyles photographed the area as the plane circled.

Taxiing toward the small boat, the aircrewman stood guard at the machine gun—ready to rake the enemy beaches with fire. When Pyles helped the injured pilot into the rear cockpit, they were just 50 feet from the Jap skiff. . . . But Lady Luck struck in another way.

A swell in the sea suddenly lifted the OS2U and set it down squarely on the sharp coral, puncturing the main float. They quickly attempted to take off, but the sinking float made it impossible.

The pilot's voice snapped through the intercom. . . . "Send an SOS." Pyles flashed a message with his aldis lamp as the plane taxied through a bed of mines. "Roger" came from a ship only a few miles away, and a small whale boat arrived to carry them out of the danger area.

Aircrewmen have what it takes
No. 26 of a series





OKINAWA

A LARGE percentage of advance information on Okinawa and surrounding islands was obtained from aerial photographs. This included location of airfields and airfield installations throughout the Ryukyus. Towns and villages were photographed. Harbors were searched for Jap ships, at least one mid-gut sub base discovered, and suicide boat bases spotted. Pictures also revealed caves, blockhouses, AA and CD guns, mortar positions, anti-tank trenches, fire trenches, rifle pits, underground installations, searchlights, radio stations, radars, bridges and military buildings. Considerable information about Okinawa's terrain was obtained from aerial reconnaissance photographs.

PHOTOGRAPHIC INTELLIGENCE

Photographic information was correlated with knowledge of pre-war visitors to the Ryukyus concerning life and customs of the inhabitants. For example, the numerous large tombs on Okinawa had to be considered as potential enemy defensive positions. Sugar mills, schools, and government buildings were real or potential factors in Okinawa's defense. An agriculture that consisted chiefly of sugar, sweet potatoes and rice simplified photo interpretation.

Aerial photography actually involved coverage of all the Ryukyu islands, plus the three Daito islands to the east and the southernmost home island of Kyushu, from which the Japs launched savage aerial counterattacks.



NAHA AIRFIELD, ON WEST COAST SOUTH OF NAHA TOWN, IS OLDEST AND THE MOST COMPLETELY DEVELOPED FIELD IN NANSI SHOTO

ITS AIRFIELDS

OKINAWA was developed by the enemy as the chief center of air strength in the Ryukyus. On it three bomber airdromes and two fighter landing grounds were built, and another landing ground was under construction. Because northern Okinawa is rugged and mountainous, all Jap airfields are located in the southern part of the island.

Okinawa is within 350 nautical miles of Formosa and

within 600 nautical miles of Kyushu, most of Shikoku, southern Honshu, southern Korea, and the China coast inland as far as Nanking on the Yangtze. This location obviously makes it a spot of strategic importance in the Pacific war.

Besides fields on Okinawa itself, the Japs built a three-runway airdrome on Ie Shima, a small island about three miles northwest of Okinawa. And throughout the Ryukyus, which stretch between Formosa and the southernmost Jap home island of Kyushu, the Japs had a chain of airfields from which their planes could take off to harass ships of the invasion fleet. Allied planes were busy smashing these fields.



Yontan airfield, captured by American troops on D-day, was second most important Jap field. It is on west central coast of Okinawa



Navy bombs smash open Adept type direction finder near Naha airdrome. Characteristic cross cables and anchor blocks are visible

NAHA airfield, located two miles southwest of Naha town on the west coast of Okinawa, is the oldest and most completely developed airfield in the Nansei Shoto. In Jap hands three intersecting limestone-surfaced runways comprise the landing area. One of these is in the final stages of construction. A large service apron extends east of the runway in the central portion of the field. Facilities (many of which have been bombed out) include two hangars, 5 shops, warehouses, barracks and associated buildings. Radio stations, a radar, and one open and several housed Adcock direction-finders are among the airfield installations. Heavy and automatic AA guns are located around the field. Naha is a former civilian field, enlarged to meet war needs.

Second most important airfield on Okinawa is Yontan, which was captured by American invaders a few hours after D-day. It is on the west central coast of Okinawa. Three coral-surfaced runways intersect at the northeast corner of the field, which is laid out on a high terrace. Yontan airfield is well drained, and photographic evidence indicates that it can be kept usable under all weather conditions. Coral-surfaced taxiways, approximately 60 ft. wide, encircle the field. Principal Jap dispersal areas and most revetments are on the southern and western sides. Some underground plane revetments are found at Yontan. Facilities, many of which were destroyed in pre-invasion bombing and shelling, include administration buildings, barracks and warehouses. Seven six-gun heavy AA batteries and six automatic AA weapons are recognizable on aerial photographs of the field.

Machinato airfield, situated 2½ miles northeast of Naha, in southwestern Okinawa, has a single northeast-southwest surfaced runway 150 ft. wide by 4,500 ft. long. One loop taxiway exists, and there are no revetments. The main Okinawa west coast highway and a railroad line parallel Machinato airstrip to the southeast. Three Jap barracks buildings formerly stood 200 yards south of the runway.

PHOTOGRAPHIC evidence disclosed that Katena airfield, which, like Yontan, was captured very early in the invasion, was the least important enemy field on Okinawa. One 265' x 4,900' coral-surfaced runway, with extensive dispersal areas, was built by the Japs here. Limited facilities, including a group of four barracks and eight small buildings, were located north of the central part of the runway.

Yonabaru airfield, on the southeast coast of Okinawa, 1½ miles northeast of Yonabaru town, had a single runway, 400' x 4,800', but was unfinished. In enemy hands it had no facilities, no defenses, and was not operational.

Itoman airstrip, south of Naha airfield in the southwest part of Okinawa, was the sixth Jap field on Okinawa island.



Jap dummy plane, carefully made from rattan, had bright red markings and was used to attract U.S. strafing fire on Katena field

Enemy attempted camouflage of runway at Katena field, which had limited facilities and fell to Americans early in the campaign



YAGAJI SHIMA, WHERE WAR CORRESPONDENT ERNIE PYLE WAS KILLED, IS AN OBLONG-SHAPED ISLAND THREE MILES NORTHWEST OF OKINAWA

NEARBY ISLANDS

THE OKINAWA invasion involved aerial reconnaissance and strikes over a great many islands in the Ryukyus and over the Daito group. Purpose of these attacks was to neutralize Jap air power in the area and to prevent use of island airfields as staging bases for planes flown in from distant enemy bases. Some strikes were aimed principally at radio stations, weather stations and radars. Photo reconnaissance also was employed to determine advisability of occupying small islands near Okinawa. The initial U.S. landings on March 26 in the Ryukyus were in the Kerama group off the southwest coast of Okinawa. Occupation of small islands gave American forces an invasion springboard and also deprived the enemy of their use as suicide-boat bases and observation posts. In conjunction with attacks on the Ryukyu islands, carrier planes and B-29's blasted airfields on Kyushu, whence came many of the *Kamikase* pilots bent on crashing into ships of the invasion fleet.

A combination midget submarine and PT-BOAT base was photographed on Okinawa south of Unten town in the

straits between Yagaji Shima and Okinawa. It had a small wharf and crane ramp, and fuel drums and loose stores also were present. Interpreters picked out tunnel entrances along the shore. The PT-BOATS were camouflaged with brush.

At the north end of Yagaji island, which is located just off the northwest coast of Okinawa, a large group of some 60 major buildings was spotted on a low oblique photograph. This included 17 barracks, administration buildings, officers' quarters, shops and warehouses.

Frequent attacks were made on airfields and military installations in islands of the Sakishima and Amami groups, south and north of Okinawa, respectively. British carrier planes cooperated with U.S. airmen in striking the Sakishima islands. Photographs showed that the Japs had three airfields on Miyako island and three on Ishigaki island. Despite repeated bombings, the enemy continued to patch up fields there. Japanese radio and weather stations also were attacked in that area. Interpreters combed pictures of islands in the Sakishima group for indications of suicide boat or amphibious tank bases. Camouflaged revetments and tunnel entrances along the shore afforded clues. In the Amami group, shipping, fuel dumps, runways and airfields were bombed, strafed and blasted with aerial rockets.



JAP AIRDROME THERE HAD THREE COMPLETED RUNWAYS, AND A FOURTH (NOT VISIBLE IN PHOTOGRAPH) WAS UNDER CONSTRUCTION

DESPITE careful concealment attempts by the enemy, aircraft were located and destroyed on the ground. Warehouses were damaged, and photographs showed extensive destruction by strafing and fire to towns and villages. Navy planes destroyed numerous small coastal craft used by the enemy to supply the islands. Here, too, persistent Japs continued to repair bomb-cratered runways.

Islands of the Daito group, 200 miles east of Okinawa, were photographed; interpreters assisted by locating airfield installations and other defenses. Navy carrier planes attacked radio installations on Kuro and Kuchino Islands at the far northern tip of the Ryukyus, close to Kyushu.

Photos of islands in the Ryukyu chain reveal the extensive nature of the Jap defense system. While not all the islands have airfields, they often have a radio station, weather station, trenches, and sometimes AA or MG positions.

Now famous as the spot where America's beloved war correspondent, Ernie Pyle, was killed by Jap machine gun fire, the island of Ie Shima is of special importance because of its large airfield. Ie is an oblong island three miles off the northwest coast of Okinawa. It has a rocky hill, Ikosuko Yama, 550 ft. high, in its central eastern section and a village of several hundred inhabitants near its eastern end. A

lighthouse at the western tip of Ie Shima is clearly visible on aerial photos.

The Jap airfield on Ie Shima had three surfaced runways, two of which were nearly parallel. The third intersected the westernmost strip. Clearing was under way for a fourth runway 3,000 ft. west of the field. Dispersal areas, connected by 35 ft. taxiways, were located east, north and west of the runway. Some 55 aircraft revetments were constructed by the enemy. Ie Shima field was equipped with administration buildings, control tower, shops, warehouses, barracks, underground storage facilities, and a radio direction finder station. A small number of automatic AA guns and some empty AA positions were noted on aerial photos. Ie Shima was seized on April 16 by elements of the 77th Army Division.

Photographic interpreters located a Jap weather station with its three characteristic instrument boxes, additional electronics installations, and docking facilities for small boats on another small island near Okinawa.

Army photographic reconnaissance planes cooperated with Navy aerial photographers in obtaining coverage of the Ryukyus.

The large picture of Ie Shima is a U.S. Army photograph.



JAPS EMPLOY ELABORATE NATIVE TOMBS AS DEFENSE POSITIONS



MOST RYUKYU ROADS ARE GOOD FOR ONE-LANE TRAFFIC ONLY



PICTURES HELPED REVEAL DISPOSITION OF THE JAPANESE TROOPS



JAP OFFICERS' BARRACKS IS CONCEALED IN GROVE OF TREES

CIVIL LIFE — TOWNS

CERTAIN aspects of Okinawan life had to be taken into consideration for best interpretation of photographs. The Okinawans have an almost Egyptian-like passion for building large limestone tombs. These burial vaults are grouped around many small hills and short, steep slopes near towns. A small excavated or heavily walled court, about 15 feet square, fronts on vaults of the wealthy. Conspicuous on photos, some of these tombs are used by the Japs as military positions.

Approximately 80 per cent of southern Okinawa is under cultivation. Sugar cane and sweet potatoes are the chief crops, and some rice is grown in low land near the coast. Throughout the island each rural house and its associated

buildings ordinarily are surrounded by a dense row of trees, which serves as a windbreak, and by stone walls.

Okinawa has no large rivers. In the rugged northern section there are short, swift streams. Longest streams are in the rolling hills of the Yonabaru, Naha, Itoman area in the south. Bridges visible on aerial photographs are short. While there are some good roads, most roads are narrow and incapable of accommodating two-way military traffic. The island has about 30 miles of railroad, centering at Naha.

Principal pre-war products of Okinawa included alcoholic liquor, beer, lacquer ware, silk pongee cloth and a type of Panama hat. Poisonous snakes, called by the Japanese "habu," and "hime habu," were common. Some were captured by Ryukyuans and their venom extracted for use in preparation of serums. Before the U.S. attacks, there were a number of good-sized buildings on Okinawa, including sugar refineries, schools, government buildings and a prison.



NAHA WAS LARGELY BURNED OUT AS EARLY AS OCTOBER 1944 AFTER NAVY STRIKES. IT FORMERLY WAS LEADING PORT OF RYUKYUS

NAHA town was largely burned out as far back as October 1944, following heavy Navy strikes on the 10th of that month. Naha is the leading port of the Ryukyus and the former residence of the governor of Okinawa. It also has served as headquarters for the island defense command. Naha is the terminus for the eastern and western coastal roads, for secondary roads leading inland, and for narrow-gauge railway lines leading north, east and south. It formerly had telephone and telegraph systems, radio stations, and radio weather station. Pre-war population was 65,000.

Many houses in Naha were stone-walled, built to withstand typhoons, but photos show that they were ruined by U.S. air attacks. Formerly Naha had a good many two-story dwellings and shops with open fronts. Comparison of aerial photographs with old maps indicates that the Japs in recent years reclaimed land along the waterfront, widened the entrance to the main harbor (which now is

filled with sunken Jap ship hulks), and broadened the two harbor basins. A channel leads from the harbor across Naha to the Asato River on the north side of the town.

Water is scarce in most of the Ryukyus, and residents save the rain water. Before the war Naha had progressed to the point where it had some 30 miles of water pipe and over 3,000 faucets in its houses.

Shuri, a few miles east of Naha, was the capital of the old independent Ryukyuan kingdom. It was the home of wealthy landowners and former Okinawan nobles. Four radio stations were detected on aerial photos of Shuri, a town that had a pre-war population of approximately 17,000.

Toguchi, in the northwest part of Okinawa almost opposite Ie Shima; Yonabaru, on the east coast opposite Naha; and Itoman, on the southwest coast south of Naha, are other major towns of Okinawa. Pictures showed considerable portions of the towns destroyed by bombing before invasion.

GRAMPAW PETTIBONE

Mooring Technique

A recent RUDM reported the failure of four PB2B-2 mooring pendants and resultant damage to all four aircraft—one sank.

No details of the conditions existing and precautionary measures taken during the storm were given in the report; however, past experience of operating squadrons has shown that seaplanes will ride out severe storms when longer mooring lines are used. The following technique is recommended for use in heavy weather, whenever possible:

1. Secure mooring pendant to buoy with 50-75' of manila line which is approximately the same strength as the pendant cable.
2. Keep planes manned and turn up engines to ease strain on mooring, if wind and seas cause pitching and jerking.

Educate 'Em

Quite a number of recent accidents, some of which were fatal, have been attributed to jamming of controls by rags, tools, fittings and miscellaneous loose gear left adrift in aircraft. Extraneous material has been found lodged in control columns, wing panels, tail sections and at wing folds, as well as in the fuselage compartments.

Grampaw Pettibone says:

Burn my britches, if that isn't a dumb way to get rubbed out! Let's run this thing into its hole and stuff it full of salt.

First, there are the plane captain and pilot who sign the yellow sheet certifying that everything is O.K. Sure, jump all over them and insist on more thorough inspec-

Watson! we must keep our eyes open!



tions. In that connection, it should also be easy to get crews of multi-place planes vitally interested in such inspections.

Back of all this, however, is the mystery of how this junk originally gets into the planes. If we can stop that, we've got the thing whipped. The moving finger points, among others, to maintenance and service



personnel. There's no possible excuse for anyone who works on an airplane leaving any debris lying around in his wake. So jump up and down on the offenders in these groups, too. Of course, supervisory personnel also hold a big chunk of responsibility in this matter. Ultimate responsibility—as usual—rests with the commanding officers of the various personnel concerned.

It isn't enough to publish an order on this subject and then forget about it. You've got to conduct a drive and educate 'em. For example, we have a Be-Kind-To-Your-Pa-And-Other-Animals Week and a Clean-Up-Your-Alley Week. Let's start a Be-Kind-To-Your-Airplane-And-Clean-Up Week—and then let's celebrate it 52 weeks a year.

You can never relax on this sort of thing. Carelessness in aviation spells t-r-o-u-b-l-e and when it results in such a thing as loose material jamming flight controls, it is very apt to spell D-E-A-T-H.

Instrument Take-off

A PV-1 crashed into the water near the end of the runway, following a night take-off. The surviving pilot stated that the engine and instruments had functioned satisfactorily during the take-off run.

After becoming airborne, the pilot commenced a normal climb on instruments. Noting that the gyro horizon indicated the plane was in a nose-high right turn, the pilot raised the right

wing and lowered the nose slightly. When the horizon failed to indicate this correction, the pilot assumed the instrument to be inoperative.

He immediately referred to the turn and bank indicator which showed the plane to be in a left turn. The pilot stopped the turn by reference to this instrument, then raised the nose as he saw the airspeed starting to increase. At this instant he struck the water.

Accepting the fact that the gyro horizon had failed, the Accident Board was still of the opinion that the pilot was too dependent on the horizon as the main attitude instrument. They recommended that all pilots be cautioned against placing full dependence on the artificial horizon, particularly during critical maneuvers. They pointed out that at such times the full use of *all* rate and attitude instruments is essential.

The Board also reminded that it was necessary to maintain a constant power setting for a longer period on instrument take-off than at other times since power is basically connected with maintaining the correct flight attitude.

Grampaw Pettibone says:

All instrument and would-be instrument pilots will do well to take heed of the sound advice handed out by this Board.

The number of accidents which occur immediately after take-off makes me wonder whether some of them might not be due to *pilot-caused* instrument failures. For example, do you know that it takes approximately five minutes at four inches of vacuum for a gyro horizon to build up to speed so that it will register correctly? Before that, it will act sluggish and fail to indicate the correct attitude of the plane—*just like the one in this accident!*

Also, do you know how to properly test your instruments on the ground, so you will know *before* you get in the air whether they will indicate correctly? Better be darn sure you do before your next instrument flight!

I'm not going to tell you about these things here. It's all explained in the aviator's Bibles on this subject, specifically in Chapter 14 of *Instrument Flight* and in Chapter 2 of the recently issued *Flight Thru Instruments*.

Clear the flight deck! . . . an SB2C gets a wave-off and veers to one side as the LSO squints up the deck, impatient about a delay that makes him wave 'em off as they come in. Teamwork is absolutely necessary between deck crew, LSO and pilot in making carrier landings, when every second counts.



Crash, Bang!

It was bad enough when one aviation cadet hit the aircraft ahead during his landing run-out because he had failed to determine whether his landing area was clear. The pay-off came two minutes later, however, when another cadet also neglected to check his landing area and ended up in the same heap.



Grampaw Pettibone says:

Thank heaven, they were able to drag these wrecks off the runway before the next cadet landed!

Navigate—or Else!

Two pilots, each with approximately 425 total hours flying time, recently were cleared for cross-country flights in SB2's. Due to poor navigation, they became lost and washed out both aircraft in needless forced landings.

In his forwarding endorsement on the reports of these two accidents, the immediate superior in command said:

In recent months numerous accidents of this type have occurred due initially to faulty overland navigation. It is felt that this is caused by limited or complete lack of experience in map reading and radio aids.

Action has been taken by this command to prevent cross-country clearances being given pilots not qualified for such flights.

▶ **Comment**—Attention of all commanding officers is invited to their responsibilities in this matter.

Paragraph 8 of SecNav letter serial 61134 of 19 July 1944 (reprinted in Aviation Circular Letter #111-44) states: "Commanding officers shall permit *only* those persons to pilot aircraft whom they consider competent to do so." A pilot who is not qualified to carry out the particular flight mission assigned, evidently can not be considered "competent."

Factors that must be considered in deciding whether a pilot is qualified to ferry naval aircraft are contained in Aviation Circular Letter #73-44. The following is quoted from this reference: "Responsibility for the assignment of properly qualified pilot . . . rests with the commanding officer of the ferrying activity and all such officers shall ensure that pilots and crews are in all respects qualified for the duty for which assigned."

Night Strafing Accident

During night strafing practice a TBM pilot (500 hours) pushed over at 2000 feet and commenced a run on a single float light. He failed to begin his pull-out in time to avoid flying into the water.

This accident was believed to have occurred mainly as a result of the pilot becoming disorientated. Evidently, he neglected to check his altimeter.

In an effort to prevent other accidents of this nature, the ISIC prohibited units of his command from night straf-

ing, glide bombing, etc., on float lights, unless a minimum of two lights were visible.

Comment—This order is considered sound and is recommended for adoption in other commands. At least two lights are required to establish a plane of reference. Depth perception will be lost and disorientation is apt to occur where only one light is visible.

The "Hurry-Up" Boys

When the engine of an SB2C-4 momentarily cut out immediately after take-off, the plane settled back on the runway. However, instead of landing on its wheels, as it should have, it settled on its belly because the pilot



already had retracted his landing gear. The plane required a major overhaul before it could be flown again.

The accident board reported that although all pilots had been advised and instructed not to retract wheels until they were sure that a landing could not be made on the same field, there was a noticeable tendency among pilots to pull up wheels as soon as planes became airborne.



Grampaw Pettibone says:

Let's look at the record. It confirms the board's observation about pilots raising their gear prematurely—to the ex-

tent of approximately 100 accidents a year. Taking into account the strikes, overhauls and repairs involved, it is estimated these accidents cost the Navy an average of \$25,000 each. Add that up on your abacus!

The parade of alibis explaining these embarrassing exhibitions includes everything from slipstreams and bumpy runways to misinterpretation of signals by flight crews. Needless to say, none ever satisfactorily explained the necessity for such ultra-snappy raising of the landing gear.

Some pilots evidently don't take kindly to the "instruction and advice" referred to by the board. It shouldn't be too hard, however, to find a cure for this sort of foolishness. All that is necessary is for commanding officers to convince themselves that there is absolutely no reason for raising the landing gear the instant planes become airborne (which is practically self-evident); then to issue a one-sentence order on the subject; and then to dish out the right kind of medicine to make it effective. And don't wait until you have one of these accidents in your squadron before taking action.

Since this sort of thing takes place only at landing fields, it shouldn't be too hard to spot offenders. Tower personnel could help. To stop all argument as to whether or not a pilot raises his gear while he still has a chance to re-land on the field, particularly if tower personnel are directed to report offenders, it will be necessary to set arbitrary limits for raising wheels, such as a definite altitude or a position with relation to the field boundary.

To all pilots: I'm not double-crossing you on this—it's for your own good. It hurts me worse than it does you. Get smart and make this standard procedure for yourself before the order comes out.

Fuel Economy

During a gunnery flight, a fighter pilot (400 hours) suddenly noticed he had only 45 gallons of fuel remaining. He immediately headed for the base but ran out of gas and was forced to crash land just short of the field.

The following comments are taken from the accident board's analysis of the underlying causes of this accident: "A large majority of pilots reporting to this command, including even ex-instructors, have little or no knowledge of the principles of economical cruising and no experience in applying these principles, to conserve fuel."



Grampaw Pettibone says:

Do you know how to fly your airplane to get maximum range? maximum endurance? If not, you better put that at the top of your list, Mister; when fuel is low and salt water plentiful, you'll be mighty glad you bothered to find out.

Fuel consciousness is largely a matter of habit and is particularly important in the combat zone. Any pilot who doesn't know how to operate his plane at maximum fuel economy and who doesn't habitually check his fuel gages and his rate of consumption—believe me, that guy is flying straight into trouble!

GRAMPAW'S SAFETY QUIZ



ALL AVIATORS should know the answers to these questions. In the air, the penalty for not knowing may prove fatal. If you miss an answer on the ground, penalize yourself by looking up the reference.

1. In what order do the following aircraft have right-of-way in flight: (a) airplanes, including rotoplanes, (b) gliders, (c) balloons, fixed or free, (d) airships?
2. Do regulations prohibit the execution of steep climbing turns on take-off?
3. Why is it necessary to be adept in flying "partial panel"?
4. Is it necessary to taxi at a high RPM in order to avoid fouling your engine?
5. When complete fuel consumption from any tank is necessary what procedure should be followed?

Answers on Page 48

DID YOU KNOW?

Do not send Money for NAVAL AVIATION NEWS

FROM time to time, the Editors of NANews receive money from readers who write to request back copies of the publication for an item of special interest to them. Latest receipts total \$5 for five back issues requested and \$2 for four.

These offers are flattering but unnecessary, as NANews is not for sale. A limited number of certain back issues (1944, 45) is available to those writing in for them and will be furnished, on request, while the supply lasts.

▶ There also is no provision to accommodate cash subscriptions to NANews, and funds should not be sent for this purpose. Thanks anyhow

Rules Given for Pay Checkage

Illegal for Clothing Loss or Damage

Questions regarding the legality of checkage of pay have revealed a Judge Advocate General opinion dated 8 December, 1909, stating that there is no warrant of law for checking the pay of an officer or enlisted man for loss or damage to government property. It has been held there is no authority of law to check the pay of an officer or enlisted man for the loss of a library book, for loss or damage to public property, for a boat taken without permission and lost, or for windows broken through carelessness.

In an approved opinion of the Judge Advocate General of 10 January, 1941, the question was considered as to the adoption of regulations providing for checkage of the pay of naval personnel for the value of government property lost, destroyed or damaged due to fault or negligence on their part. This opinion pointed out that charging against officers of the government the value of lost property for which they were responsible is in terms limited to officers or agents who are required to render property returns.

In view of the foregoing, it would appear that only appropriate disciplinary action may be taken against personnel where loss of equipment results from negligence or carelessness. Regulations which govern the procedure to be followed in making replacement issues of flight clothing are given in ART. 2750-4, Bureau of Supplies & Accounts Manual.

JATO Helps Save Six Aviators

Success Marks First Operational Use

In the first operational use of jet-assisted take-off for a naval flying boat, six Navy aviators were rescued in the Western Pacific not long ago, after they had been forced down at sea within one mile of Japanese positions.

A JATO-equipped *Mariner* was standing by on *Dumbo* duty for a flight of Navy PV *Ventura* medium patrol-bombers during a raid on Japanese-held positions. One *Ventura* made a forced landing. None of the crew was injured, and they scrambled into life rafts.

Within 45 minutes of the crash, the JATO-equipped *Mariner* had landed, taken off the *Ventura* crew, and had effected a rescue.

Three nights later, another *Mariner* from the same squadron used JATO for a night take-off.

The fact that JATO reduces the take-

off run from 33 to 60 percent and greatly increases a plane's load potential is being utilized to good advantage now in actual operations.

These flying ambulances have 1200 hp. engines and by means of JATO are now able to rise from heavy seas or small lagoons where operations would have been impossible previously. From Hawaii, they can reach the mainland in about 12 hours. On return trips they are able to carry several tons of cargo. The two-storied hold has facilities for carrying 25 wounded men in stretchers, furnishing them food and hot drinks, and giving them the best possible medical attention.

Dumbo is only one duty of *Coronados* which originally were built for patrol bombers. The same type of boat is used in bombing, patrolling, strafing and scouting, and NATS uses them in its globe-spanning passenger, cargo flights.



THE FINEST movie of Naval Aviation in action, *The Fighting Lady*, carried off an Oscar in the 1944 competition conducted by Hollywood. Judged the best documentary feature of the year, the film was awarded the prize at the annual presentation in that city. Assistant Secretary of the Navy for Air Artemus L. Gates and Rear Admiral Dewitt C. Ramsey accept the statuette. *Fighting Lady* has won acclaim wherever it has been shown.

BEST ANSWERS

Trigger Talk

PICK THE BEST choice to complete the statements below, then check your answers on page 48.

- Long-range shotgun shells derive their power from—
 - a—black powder
 - b—ballistite
 - c—progressive burning powder
 - d—glycerine
- You are hunting squirrels with a .22 caliber rifle in a dense woods on a dark day. Best sight is a—
 - a—bead and notch sight
 - b—telescopic sight
 - c—peep sight
 - d—ring and post sight
- A gun can be fired most safely when the—
 - a—barrel is oiled lightly just before using
 - b—cartridge case is oily
 - c—cartridges are shined before using
 - d—chamber is wiped with a dry cloth just before firing
- The greatest cause for an increase in accuracy of the present-day rifle as compared to the early muzzle-loader is the—
 - a—type of explosive used
 - b—rifling in the barrel
 - c—steel bullets
 - d—shell case
- The type of bullet among the following most likely to cause fatal injury is a—
 - a—sharp-pointed full metal case bullet
 - b—lead bullet with a round end
 - c—lead bullet with a flat end
 - d—lead bullet with a hollow point
- Of the following guns, the most effective at 100 yards is the—
 - a—.45 caliber pistol
 - b—.22 caliber rifle
 - c—12-gauge shotgun
 - d—.38 caliber pistol
- The only gun among the following not good for personal protection is a—
 - a—caliber .45
 - b—5-inch, .38 caliber gun
 - c—caliber .22
 - d—28-inch, 12-gauge gun

CARRIERS

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FROM YOU!



V-E Day Emphasizes Navy's Job

Plans To Be Ready For Demobilization

Plans for rapid and orderly demobilization of naval personnel after final victory are keeping pace with the growing tempo of war against Japan. Attention is called to this fact in the following statement from the V-E DAY broadcast by Vice Admiral Randall Jacobs, USN, Chief of Naval Personnel:

"Our need for men . . . is not reduced by the end of the war in Europe. We have more work to do—not less. The Navy has been working on demobilization plans for some time. The Navy will be ready for demobilization, when demobilization is possible."

In a broadcast message to America on the same occasion, Vice Admiral Marc A. Mitscher declared:

"Our enthusiasm and our determination to bring the Japanese war lords to their knees are mightily fortified by the knowledge that now, all the productive might, military and naval power in our resources will be directed side by side with us. And against us not even so stubborn and vindictive an enemy as the Jap can long survive. But so long as he does survive, the cloud of our continuing war will cast its shadow on the celebration of our hard-won European victory. Toward the removal of that shadow, toward the second and final victory to end this world conflict, we must all dedicate every unsparing effort."

Jap Aircraft Get Number System

Navy Adopts Plan for Telling Changes

Model designations of Japanese aircraft now are being listed according to

the system used by the Japs themselves. A difference, however, exists between Jap Army and Navy nomenclature. Navy model numbers are composed of two digits, and the first version of a Navy plane always is known as Model 11, according to Technical Air Intelligence Center at Anacostia.

As modifications are made to this basic version, the first digit of the model number is increased if the change is structural and the second digit is increased if the engine is changed. Thus a Zeke 11 becomes a Zeke 21 if the wing structure is altered, a Zeke 12 if only the engine is changed, and a Zeke 22 if both changes are made. With further changes the digits increase in progression.

Model numbers of Jap Army planes are composed of only one digit, and the first version of an Army plane always is known as Model 1. The model number may be increased if either an engine or a structural change is made in the original version.

Formerly, arbitrarily chosen "Mark Numbers" were used by the Allies to indicate various modifications of a Jap aircraft type. These proved confusing, however, and inadequate to handle the numerous modifications involved. As a result, the Mark System has been abandoned, and the numbers now used are those applied to the planes by the Japs themselves. Technical Air Intelligence Center, NAS ANACOSTIA, is the agency responsible for official listing of Japanese designations of airplane models.



PARKED BUMPER to bumper and hub to hub, Marine vehicles crowd every inch of space on the flight deck of this Essex class carrier temporarily converted by military necessity into a floating garage. Carriers, on occasion, can be converted into floating air transports for high priority military equipment. To conserve space and accommodate a larger load, jeeps, small vehicles are loaded on top of larger trucks. The elevator aft is kept clear.



THE FOLLOWING points taken from the annual report of accomplishment by the Aviation Safety Board of the NAVAL AIR TRAINING BASES, CORPUS CHRISTI, are considered good examples of what can be contributed to aviation safety by these boards.

1. Auxiliary Power Plant for Tower Transmitter

The need for an auxiliary power plant presented itself as a result of a crash that severed the main electric power line. The transmitter in the landplane tower at the main station was silent for some ten minutes while air traffic congregated in the traffic circle. A recommendation by the Aviation Safety Board that auxiliary power plants be installed in all towers for emergency use was forwarded to the NATC operations officer for action.

2. Conspicuous Marking of Obstructions in Corpus Christi Bay

As a result of several complaints that many unmarked obstructions in the Bay existed, the Aviation Safety Board caused a canvas to be made among one hundred P-BOAT instructors, requesting them to make notations of all obstructions so unmarked. Cumulative results were forwarded to the Board. A recommendation was made to the yard craft officer that all such obstructions either be removed or marked in a conspicuous manner, and that the squadron safety officers of 18A and 18B be consulted as to the manner of marking obstructions to insure maximum visibility from the air.

3. Conspicuous Marking of PBY's

As a result of Safety Board investigation, it was discovered that the over-all gray color of PBY's presented a safety hazard in that these planes, when so colored, were difficult to observe on the water by the pilots of other P-BOATS coming in for landings. A recommendation was therefore made to the NATC operations officer that the entire top surfaces of the wing and tail of all PBY's at the Center be painted yellow in color to increase their visibility.

4. Visual Illustration of Traffic Patterns Throughout the Center

In an effort to increase the pilot's knowledge of the various traffic patterns through a better means of obtaining traffic pattern information, the Aviation Safety Board recommended that a three-dimensional illustration of traffic rules and patterns be constructed and prominently displayed in a conspicuous place for all pilots to observe.

5. Traffic Plan

As a result of observations made by Safety Board members in various traffic towers throughout the Center, a need for a more positive control of traffic became apparent. A traffic control plan set forth in detail was submitted by the Aviation Safety Board to the NATC operations officer for consideration.

6. Crash and Rescue Alerts

Since some degree of confusion and lack of coordination appeared to be present in the functioning of crash and rescue operations, it was recommended "that a series of crash and rescue alerts be periodically conducted."

7. Instruction Hours Ceiling

Since some implication appeared in accident rates that fatigue of instructors was a contributing factor, it was recommended "that an official ceiling be placed on the number of hours to be flown per day by instructors."

8. Traffic Control Towers

Since malfunctioning of control towers was connected with accidents reported, it was recommended "that each and every traffic control tower be staffed with competent personnel and at least one full time tower officer in charge."

9. Landing Gear Lights on SNJ Aircraft

Since certain night landing accidents appeared to occur through use of an

aldis lamp that when flashed on the plane to check position of the wheels blinded the pilot, it was recommended "that landing gear lights be installed on SNJ's used for night flying."

10. Instruction in Gunnery Runs

It was felt that because of present syllabus requirements, students flew too close to the target sleeve in gunnery runs in order to get the required number of hits. This constituted an unnecessary hazard that might well lead to fatalities, and it was recommended that greater stress be placed on the particular maneuvers involved in gunnery runs rather than stressing the number of target hits.

11. Mid-Air Collisions in Formation

Since mid-air collision in formation flying appeared to be too frequent, it was recommended "that greater intervals be maintained in formation flying."

12. Flight Hours

Since frequency of accidents appeared to coincide with the pressure in squadrons to pile up flight time, it was recommended "that inter-squadron competition on the basis of number of hours flown, be discouraged."

13. SNJ Taxi Trainer

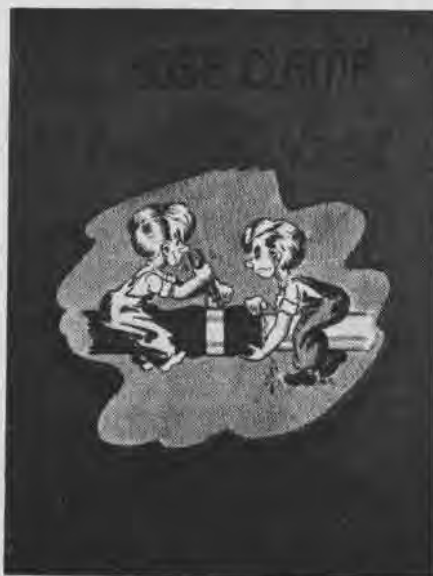
Since an inordinate number of taxi accidents in the SNJ indicated the need for a greater amount of taxi instruction, it was recommended "that the use of an SNJ taxi trainer be incorporated in the squadron training and that a more thorough taxi check-out be given."

14. Staggering of Flights by Squadrons

Since congestion on a field where two or more squadrons operate at the same hours tended to increase accidents, it was recommended "that flights of two or more squadrons operating from the same field, be staggered."

15. Suggested Remedy of Monotony Fatigue of Instructors

It was the opinion of the NAS medical officer, concurred in by the medical section of the Aviation Safety Board, that efficiency and safety of aviation training was lessened by monotony fatigue of many local flight instructors. It was believed this state of fatigue arose from the fact that the instructor is required to follow, day after day, a relatively rigid routine of work. In an effort to alleviate this condition, a recommendation by the medical officer, endorsed by the Aviation Safety Board, was forwarded to the superintendent of aviation training, calling this condition to his attention and suggesting rotation of instructors to various squadrons, and the organization of a special squadron set up to provide for deserving instructors flights in aircraft of types different from that which they fly every day.



SHOP POSTERS showing right and wrong procedures are used periodically by NAS Moffet Field to aid inexperienced personnel. Some are available to other naval activities.

ESCORT CARRIER CAPTURES U-BOAT



CAPTAIN GALLERY

NEW LAURELS for the Navy's escort-carriers have been announced belatedly for a CVE task group that captured the German u-boat U-505 off West Africa and towed it 2500 miles to Bermuda. Capture was made by the U.S.S. *Guadalcanal* and her five DE's off French West Africa. It was the first time the Navy had boarded and captured a foreign enemy man-of-war in

battle on the high seas since 1815. A DE picked up the sub first on its sound gear. Carrier planes located the submerged u-boat and guided destroyers to the attack by firing fixed guns into the water and zooming the spot directly above it. So that the submarine could be captured and studied, only anti-personnel shells were fired at it when it surfaced, forcing its crew to abandon ship. Boarding parties in whale-boats headed for the sub, which fired a torpedo at the CVE. First aboard was a DD's crew. Rushing below to fight it out, they found only one dead man, but the sub was scuttled and filling with water. Although the men were unfamiliar with undersea craft, especially German, they were able to pump out the water, charge the batteries by letting the screws turn the propeller shafts and bring the boat to full surface trim. The captain of the task group, a naval aviator, was an expert on booby-traps. He personally opened one door on the submarine. So that the sub would not flounder in the heavy seas, its conning tower hatch had to be closed. With water pouring into the hull in many places, this might have sealed the boarding party's fate had the men not quickly shut off the leaks. Fifty-eight survivors of the U-505 were imprisoned. The capture of the ill-fated German under-sea craft took place on June 4, 1944.

◀ German crewmen ascend a ladder to board *Guadalcanal*. With them they bring only casualty of U-boat 50-man crew



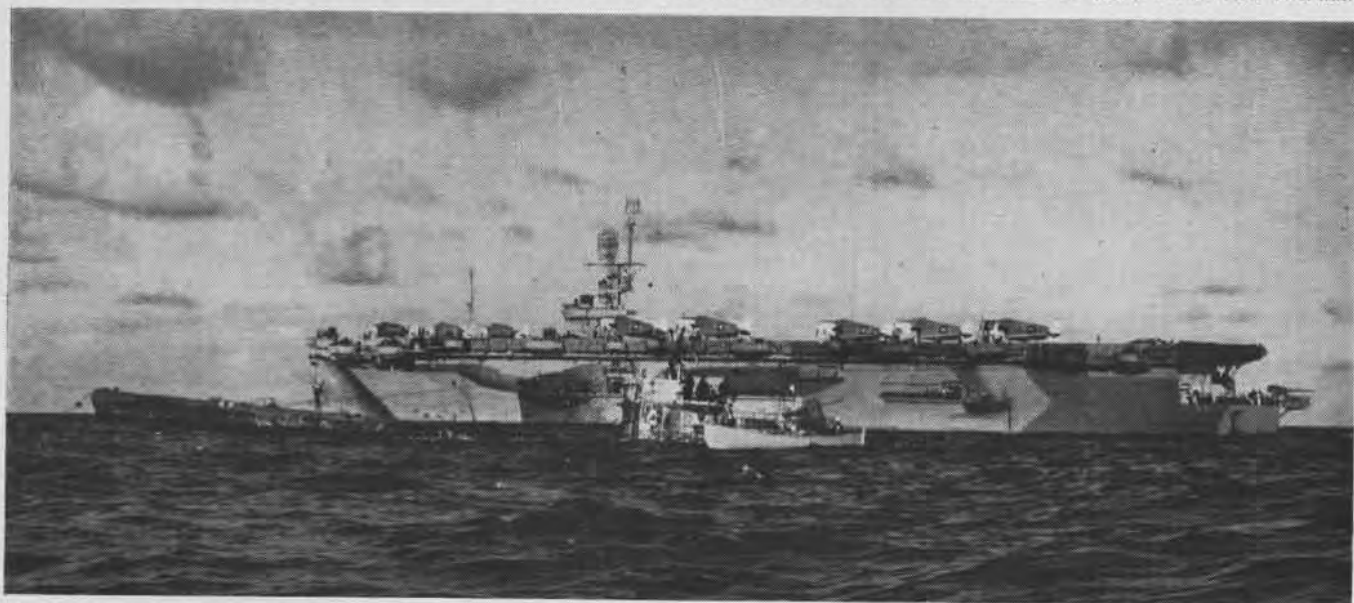
ROOM WHICH CAPTAIN HIMSELF OPENED, FEARING BOOBY TRAPS



BOARDING PARTY WITH HANDY-BILLY PUMP GO BELOW DECK TO PUMP OUT WATER. HATCH WAS CLOSED TO KEEP OUT THE SWELLS



U-BOAT CREWMEN, PRISONERS OF WAR, SUN THEMSELVES ON ELEVATOR OF GUADALCANAL, LOWERED TO MAKE A PEN FOR THE MEN



CVE PULLS ALONGSIDE THE SUBMARINE WHILE BOARDING PARTY TAKES OVER. CARRIER TOWED THE SUB BACK TO UNITED STATES

TOKYO TALKS

-TO THE JAPANESE EMPIRE

The enemy has intensified his naval bombardment and bombings of our coastal positions on Okinawa. At least 29 enemy surface craft have so far been sunk and six others heavily damaged by our Kamikaze special-attack corps. Until recently each time our special-attack planes approached, the enemy quickly spread smoke screens and fired anti-aircraft artillery. However, the barrages have been reduced and the smokescreens spread only in portions, proving that the enemy's supplies are being exhausted.

-TO THE JAPANESE EMPIRE

An enemy task force which had temporarily withdrawn from waters near the Japanese mainland in the fear of our attacks, recently launched raids against various areas in Kyushu. Following daring attacks by our special-attack corps flyers and by our torpedo squadrons the enemy task force was put to flight after suffering grievous losses. However, the fighting strength and spirit of the reckless enemy evinces a quality of tenacity and determination and the battle for the Okinawas which will decide the fate of the Empire grows in intensity day by day.

-TO JAPAN

We now know what it has meant to us to have Saipan and Iwo Jima fall into enemy hands. Fully aware of the serious effects of the loss of these important island outposts, we are convinced that we must defend the Okinawa Islands at any cost. In this hour of crisis confronting the entire Nation, it is impertinent merely to set forth plausible reasons for our failure to carry out production as originally scheduled. This is the very moment when all available materials should be used to step up our production. It is now or never.

-TO JAPAN

Japan's material strength cannot compete with the resources of Britain and the U.S., and there is a tendency to place too much faith in divine aid and guidance. The decline of Japanese strength after the initial victories was due to a slackening in the Japanese spirit. The people place too much faith in the triumph of justice and the inevitability of history. Even the inevitable can be delayed if there is a loss of spiritual strength, and only united adherence to the task at hand will hasten the realization of Japan's humanitarian ideals.

-TO EUROPE

It is well for the U.S. to remember Pearl Harbor. But they should remember what they did to Japan before that debacle. True, the enemy may point to Japanese operations in China, and her alliance with Germany. But the American nation seems to have forgotten what had existed in world affairs before the China incident and the Japan-Germany alliance. . . . We need

not go back to the past record of the Anglo-Americans, especially America, to show that their international conduct has been marked by a total disregard of this principle of justice.

-TO EUROPE

This war has been waged for our own existence and in self-defense. The defense of the national polity of Imperial Japan and the security of the right for existence of the Asiatics depends on the outcome of the war. We had not the slightest intention of relying on the power of Germany in prosecuting this sacred war.

-TO THE UNITED STATES

We Asiatics are not fighting for any territorial gains. We do not want to encroach on anybody's rights. We are content with what we have and are prepared to suffer and sacrifice anything to maintain it. Japan has proved in unmistakable terms she has no territorial ambitions, and her only aim is to establish a new order based on freedom, justice and equality.

-TO JAPAN

The homeland is fast becoming a battlefield the same as Rabaul. The factories are constantly under attack but every day the nation is stubbornly carrying on. Even though the conditions are trying, please do not be too overly concerned about your homeland.

-TO JAPAN

The Tokyo Metropolis has opened a special ward to care for the school children now evacuated in the outlying areas who were orphaned by the series of indiscrimi-

nate raids in the business and residential districts of Tokyo.

-TO THE HOMELAND

President Truman in a recent special proclamation directed at Japan stated that American war aims do not lie in the 'extermination' or the 'enslavement' of the Japanese people. If her war aims are not to be cruel, then the U.S. Government must give proof to the President's proclamation through action and not merely through words.

-TO THE HOMELAND

The next great change at home is the formation of the Civilian Volunteer Corps. The formation of this corps is to further strengthen home defense and boost production. If an emergency arises the corps will immediately participate on the fighting front.

-TO JAPAN AND EMPIRE

Reports have been received of the terrorization of Japanese nationals in California. These deeds are typical of American bestiality and are reprisals for America's present inability to further the Pacific offensive.

-TO JAPAN AND EMPIRE

School children have cooperated with the Armed Forces to the extent of hurling themselves upon the enemy with hand grenades. Final exhortations to the Emperor by girls about to die show their determination to partake fully in the war to save the Empire.

-TO JAPAN AND EMPIRE

The Indian Ocean will be the main operational base in the coming counter-offensive against Japan, and we may expect a combined sea and land operation in areas between northern Malaya and southern Thailand as well as the northern tip of Sumatra. The British Army in Burma will attack the Japanese positions on land while the Americans will increase their activities in the Pacific. Thus the enemy plans to attack Japan from both east and west.

-TO PHILIPPINES & BORNEO

Enemy troops which landed on Tarakan are resorting to barbaric methods such as the use of natives to protect themselves against our close-quarter assaults. These Indonesians are also being forced at the point of bayonets to guide American troops towards our lines. The enemy provides hardly any water or food for these captured natives who are left in a state of semi-starvation. If they show any sign of dissatisfaction the Americans beat them to death.

-TO THE UNITED STATES

Vast expanses of untilled land, transportation difficulties, lack of cattle, horses, tools and fertilizer all point to dire famine in Europe this coming winter. The U. S. expects to send 12 million tons of foodstuffs to countries under Allied occupation, but has stated that Germany cannot hope to receive the bulk of these shipments, as was previously reported.

SHOW ME THE WAY TO GO HOME



Link Problem

Date: 20 June 1945. Var. 9° E. Zone: 11. Pt. Option data: Time 0800; Lat. 10° 40' S, Long. 159° 40' E; cus 050°, speed 20 k. Departure time: 0800. Wind: 260°/30 k. Altitude: 2000 ft. CAS 154 k. Temp. + 16° C. MH 245°.

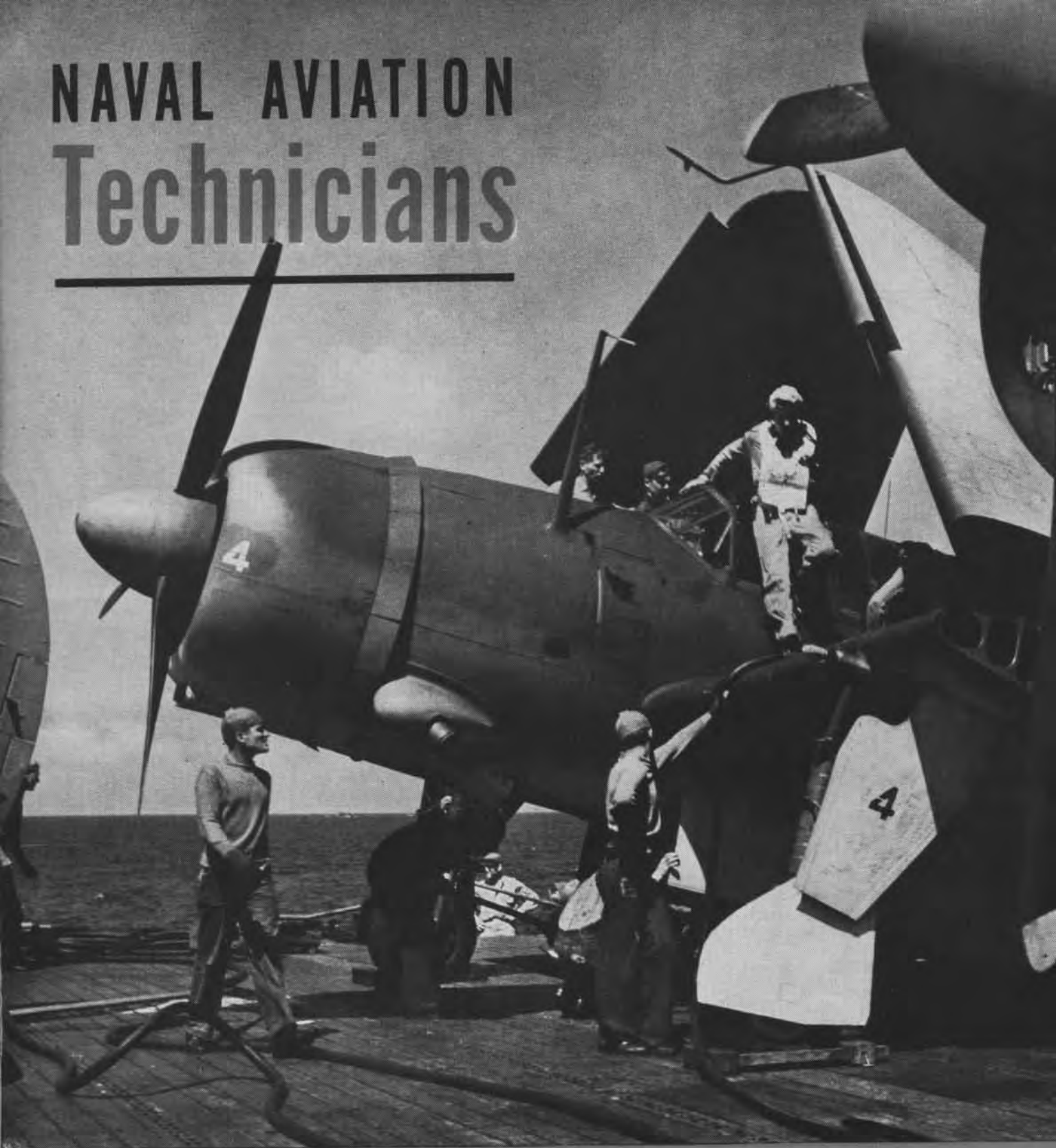
"Vectors" are magnetic headings.

Timing
At 0805 Vector 160°
At 0812 Vector 075°
At 0818 Vector 180°
At 0828 Vector 100°
At 0828 Begin interception Pt. Option

1. What is 0838 G.P.?
2. What is ETI?
3. What is EPI?

(Answers on page 48)

NAVAL AVIATION Technicians



TREAMING up with the Navy's combat pilots in far-flung fighting fronts of World War II are silent legions of technicians. Often, these men do not play a spectacular part in the combat theater, but their contribution to the war effort cannot be emphasized enough. This is a technician's war. As many as 20 men are needed to keep one plane flying. They must be skilled men—the kind the Naval Air Technical Training

Command is producing from its 60 training activities. Combat veterans return from the Fleet to NATECHTRACOM schools, catch up on all the technical advances made while they were away, and carry the word with them back to the Fleet. Vocational education has been carried years forward by training techniques developed by NATECHTRACOM. That training brings closer the day when these men return to civil life.

NAVAL AIR TECHNICAL TRAINING COMMAND



TWENTY-ONE RATES ENLISTED MEN BACK AIR POWER

GEOGRAPHICALLY, the Naval Air Technical Training Command stretches from the Atlantic seaboard to the Pacific. Command headquarters were established in Chicago in 1942. Under its jurisdiction are four types of naval activities designated as *groups*.

GROUP I: These activities are distinguished from all others of NATECHTRA COM by the fact that they comprise an independent command, have their own commanding officers who report direct to CNATECHTRA. Each **GROUP I** activity is made up of a number of different training schools. There are five **GROUP I** activities (training centers): MEMPHIS, NORMAN, 87TH & ANTHONY, CHICAGO, CORPUS CHRISTI and NAS MINNEAPOLIS.

Group II Reports Also To CNATECHTRA

GROUP II: All **GROUP II** activities are separate commands, also, but they differ from the first group in the fact that they are located within the physical limits of another naval establishment that is not under NATECHTRA COM. Each **GROUP II** command comprises a number of different training schools and reports direct to CNATECHTRA. There are only two of these activities. The larger is located at NAS JACKSONVILLE. The other center is at GAINSVILLE.

GROUP III: These are naval training schools located at naval establishments not a part of NATECHTRA COM. They are distinguished from other training activities by the fact that the officers in charge report to CNATECHTRA *via* the

commanding officer of the station where they are located. The station has jurisdiction over military matters of the school. However, the officers in charge of the school direct all training matters. Included in this group are 15 different activities, typical ones being schools at LAKEHURST, ATLANTA and PENSACOLA.

Factories House Group IV Activities

GROUP IV: These training schools are located at factories and manufacturing plants. Officers in charge report to CNATECHTRA direct or *via* area officers. There are eight such activities including line maintenance schools at Martin, Douglas, North American, and others.

Technicians who receive training at these NATECHTRA COM activities include these 21 aviation rates: AM, AMM, ANMH, AMMI, AMMP, AMMC, AMMT, AMMF, AEM, ARM, ART, AOM, AOMT, AFC, AEBM, PR, PHOM, SKV, control tower operators, Link celestial navigation trainers and specialists in aviation devices.

Nine types of officers receive training at NATECHTRA COM schools. These include officers trained for the field in airborne electronics, air combat intelligence, aviation communications, aviation engineering, aviation ordnance, photographic officers, Link trainer officers, officer teams for CASU(F)B component and photo interpretation officers. In general, all Naval Aviation technical training, except pilot training, is conducted at the 60 NATECHTRA COM activities.

WHERE THEY TRAIN

MEN ATTEND A, B, OR C SCHOOLS

TRAINING falls into three general classifications: A, B and C schools. CLASS A schools are *basic* in the sense that they qualify non-rated men for a third class petty officer rating. CLASS B schools are *advanced*. They qualify rated men or designated seamen, equipping them with the science of their specialty so that they are prepared to cope with any new development, now or in the future.

CLASS C schools are specialized. They give training in particular subject or skills. (Requests to enroll men in either B or C schools should be directed to BUPERS via the commanding officer, with a copy forwarded to CNATECHTRA.)

Early in the war, the training primarily was basic but now about 75 percent of the students are in advanced B and C schools. In basic training one instructor could teach a large class of trainees, but that time is nearly past.

A-Schools Train 10 Different Rates

In general, trainees entering A schools are second class seamen fresh from boot camp where they took aptitude tests to determine their adaptability for special types of work. NATechTraCom trains them for the job they fit best.

Men of 10 different rates are trained in A schools, taking courses which vary from six to 21 weeks. Aviation rates trained include: AMM, AM, AOM, ARM, AEM, AERM, PR, PHOM, SPY and SAD.

Big three in the A training program are the centers at NORMAN, MEMPHIS AND JACKSONVILLE. Norman trains AMM's, AM's, and AOM's and turns them out as third class strikers. At MEMPHIS, ARM's get basic training. JACKSONVILLE trains the AEM's; NAS ATLANTA, control tower operators; NAS LAKEHURST, PR's and AERM's; NAS PENSACOLA, PHOM's, and NTS, U. OF CHICAGO, trains in special devices.

In B training, strikers or men already rated, have the opportunity to focus their further training upon some particular part of their field. For AMM's the big B-school is 87TH & ANTHONY where they can center on carburetors, hydraulics,



VISUAL AIDS ARE EMPLOYED IN TRAINING LARGE CLASS A GROUPS

aircraft engines, instruments or propellers. These CLASS B courses range from 12 to 20 weeks. With the exception of AMM *engine* men, the graduates leave B training with a new designator on their rating. For example, an AMM specializing in hydraulics graduates as an AMMH.

All of NATechTraCom CORPUS CHRISTI is devoted to one big B school on airborne electronics maintenance. There, in 28 weeks, students get a comprehensive course in airborne electronics. They arrive as SIC; leave as ART's.

NORMAN has a B school for AM's. JACKSONVILLE gives B training for AEM's, AOM's, AOMT's, AFC's and has a school in line maintenance of automatic pilots. MEMPHIS and NORMAN give B training for returned combat aircrewmembers.

Having completed these first two stages in training, a Navy technician has not only a wealth of practical schooling and experience but a technical background in theory that makes him able to meet any situation. In CLASS C line maintenance his training reaches its peak of specialization.



ROCKETS are attached beneath wing of a Helldiver by trainees at Class B ordnance school. All short course training is practical



TURBO JET training in NATechTraCom Class C schools utilizes the blackboard and other visual aids, along with the equipment

ON THE LINE C-SCHOOLS TURN OUT TOP NAVY SPECIALISTS

A PARTICULAR subject or skill forms the basis of all CLASS C training and when trainees have completed the course, they are experts in their chosen fields. Because this training is designed for an advanced specialization, the courses offered do not include full general requirements for an advancement in rating.

There are two kinds of CLASS C schools: C-1 schools which are located at naval establishments, and C-2 schools which are not on Navy property, but are located at factories or manufacturing plants.

Twelve Activities House C-1 Schools

The technical training command has 21 different C-1 schools, located at 12 naval activities.

NATECHTRACOM MEMPHIS: Line maintenance schools for F4U, F6F, F7F, F8, SB2C, SC, TBM, TBY.

NATECHTRACOM NORMAN: Rubberized equipment repair

NATECHTRACOM 87TH & ANTHONY: Turbo jet

NAS MINNEAPOLIS: Line maintenance in PB4Y

NATECHTRACOM JACKSONVILLE: Aviation storekeepers

NATECHTRACOM GAINSVILLE: Air navigational radio aids

NAS PENSACOLA: Motion picture camera, camera repair

NAS ASTORIA: Line maintenance in PBM

NAS QUONSET POINT: Celestial Link trainer

NAS ANACOSTIA: Printer

NAAS SAN CLEMENTE: Special projects for air

NAAS OAKLAND: Air transport service

In addition to the score of C-1 schools, NATECHTRACOM has C-2 schools located in six different factories and plants.

Here the trainees become familiar with methods used by manufacturers. These specialty schools are as follows:

1. *Aircraft Instruments*: Sperry Gyroscope Co., Brooklyn

2. *Aircraft Instruments*: Sperry Gyroscope Co., El Segundo

3. *Pioneer Instruments*: Pioneer Instrument Service School, Philadelphia

4. *JRM Line Maintenance*: Glenn L. Martin Co., Baltimore

5. *PBJ Line Maintenance*: North American Aircraft Corp., Inglewood, Calif.

6. *R5D Line Maintenance*: Douglas Aircraft Co., Santa Monica

In many cases, naval activities have a specific need for personnel trained in the operation and maintenance of one certain type of equipment such as the gun sights or automatic pilot. In such cases, NATECHTRACOM offers many different short courses which give the kind of training needed. These special short courses vary from one to three weeks.

Men Train Now With Newest Models

Time was, during the early days of 1942, when little equipment was afloat and still less was available ashore. In those days, NATECHTRACOM trainees were forced to use what was at hand. They were happy to tear down even an obsolete plane in order to learn the lessons of Naval Aviation. But that day is gone. Today NATECHTRACOM gives them the newest models with which to work.

Nowhere is this more true than in the command's line maintenance schools which are training men to repair some planes so new that they are not yet being sent to the Fleet.



TEAMWORK is one of the important lessons trainees must learn at NATECHTRACOM Class C schools. In actual practice it takes

men of many different aviation rates, coordinating their efforts, to keep Navy planes flying and equipment operating properly



LINE MAINTENANCE SCHOOLS GIVE 10 PERCENT THEORY AND 90 PERCENT ACTUAL EXPERIENCE WORKING ON NAVY TYPE AIRCRAFT

TECHNICIANS LEARN TEAMWORK

AT BOTH ASTORIA and MINNEAPOLIS, line maintenance men are given group training in its most advanced form. Teamwork keynotes both training programs. Trainees arrive to work as one big ground crew team, which even retains its own officers and leaves as a team, shipping out for advanced base operations.

At MEMPHIS the trainees work, not as a definite crew, but as technicians whose activities are coordinated. They come into the line maintenance schools from all over the world; from the Fleet, from CASU's, PATSU's, ABATU and from A&B shops ashore. All of them are either rated men or designated first class seamen with CLASS A training.

Line maintenance school at MEMPHIS lasts four weeks.

Trainees get 90 percent practical experience and 10 percent theory. Theory is gained in classroom instruction utilizing such aids as film, charts and demonstrations. They get practical experience by working out on the line upon the same type of plane they will repair in the war theaters.

Instruction for AMM, AM, AOM, AEM is complete. One typical example of this is the system used in training an AOM. This technician makes a thorough study of ordnance gear and learns the art of properly hoisting bombs into the rack. He gets special instruction on trouble-shooting the ordnance electrical and hydraulic systems.

This training takes in a cockpit check-out, gun installation, bore-sighting the 20 mm. and .50 cal. guns, installation and operation of cameras, installation of rocket gear and familiarization with bomb sights.

At the end of four weeks, this technician with a post-graduate degree, returns to his command or reports for further transfer as a bigger asset to the Fleet than ever before.



OBSELETE planes and equipment were the only kind available for training during the early stages of the war. Now the Navy

gives NATechTraCom priority on all first models so that trained men can be ready for the Fleet when new equipment is available



ARM'S ARE ONE OF THREE BIG AIRCREWMAN RATES NOW TRAINING



AOM'S GET FIRST TRAINING AS AIRCREWMAN AT NORMAN CENTER

COMBAT AIRCREWMAN NAOTC GIVES HIM WINGS

FOR COMBAT aircrewmanship, NATECHTRACOM holds special significance. It is the command they report to when they enter service for boot training, technical schooling. After many months at sea, they return again to NATECHTRACOM to get the greater knowledge they need to further advance themselves in rate.

First of all, a combat aircrewman is a top fighting man who is alert and physically fit. While still a civilian, the future aircrewman is screened for physical aptitude and earmarked, then and there, for one of the three big combat aircrew rates, AMM, AOM, or ARM.

Completing boot training at the MEMPHIS recruit center, the CA heads for a NATECHTRACOM school. If he is to be an ARM, he stays at MEMPHIS; if an AMM or AOM, he ships to



THIRD IN THE big three among combat aircrewman rates are the AMM's. After combat duty they return for more training

NORMAN. At these centers he gets basic training lasting from 18 to 21 weeks. By taking this training the CA qualifies for his third class crow. Here, too, the trainee gets his first instruction that will form the foundation for later schooling as a fighting aircrewman, since part of the basic includes a course in primary gunnery.

Radar Operator Training Is Given CA

Because these trainees are destined to be the men behind the free guns in Navy torpedo planes and bombers, the primary gunnery course focuses on MK 2 .50 cal. Browning machine guns. Men study the ring sight, are given recognition training, learn visual signaling in all its forms, tearing down and reassembling their guns.

When they have finished basic and have qualified for a rating, the CA's take an intensive course in a NATECHTRACEN radar operator's school. This lasts two weeks. During the period they learn to operate radar gear, how to keep a log, how to preserve security if shot down and how to use radar as a navigational aid. They even learn to ground-check and flight-check their own equipment, so that they never will foul up their radar by blundering.

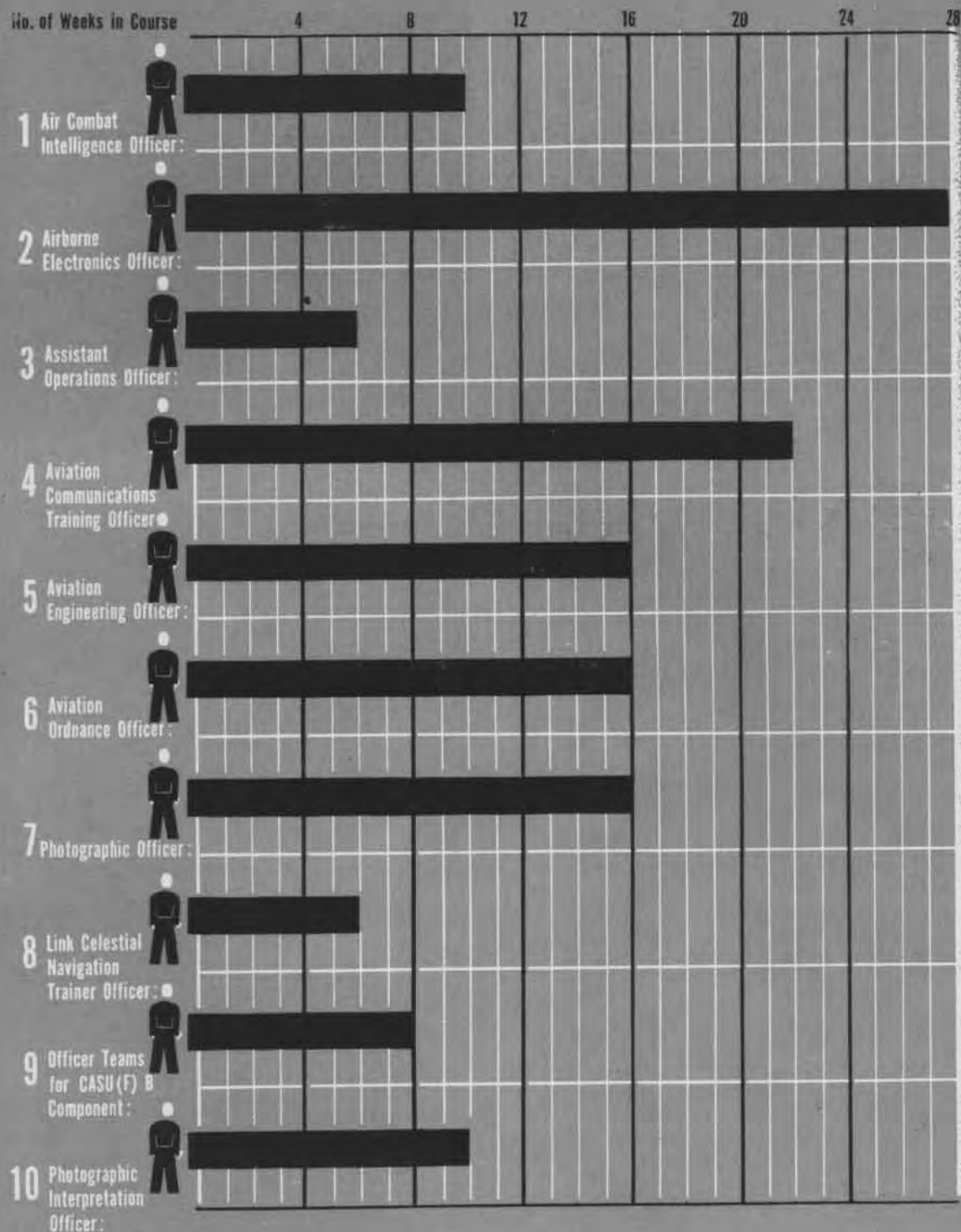
At the end of two weeks the CA ships out to a Naval Air Operational Training Command school to become flight personnel. At the end of flight training the CA pins on a pair of silver wings, heads for the Pacific with his squadron.

After Combat, CA Gets Extra Training

Months pass and the combat aircrewman earns his rate advancement the hard way, sweating it out behind a bucking machine gun in the turrets of a Navy plane. Finally, the time comes when he is ready to go back ashore. He comes back with a higher rating, but has not had much chance to learn the technical things he should know.

At NORMAN or MEMPHIS he is screened, given credit for the things he has learned while with the Fleet, and fitted into the training program where he belongs. In eight weeks he gets the technical knowledge he needs not only to earn higher rates, but to hold a better job in peacetime world.

Officer Types Trained in NATEchTraCen Schools



AMONG the tens of thousands of enlisted men who pass through the NATECHTRACOM schools every month, students can be spotted every now and then who wear the insignia of an officer. Because naval personnel is predominately enlisted, 25 or 30 enlisted men are found in the command's classrooms for every

officer student. However, one rule holds true—regardless of rank or rate, every trainee found there is a technician. Some of the technical officers come back from the Fleet, while still others arrive from shore or advanced base activities for specialized training. Frequently, they take a course in one certain subject.



MOCK-UPS ARE AID IN TRAINING STUDENTS AS INSTRUCTORS



RATED MEN LEARN TO TEACH AUTOMATIC PILOT MAINTENANCE



RADIO HOLDS NO MYSTERIES FOR NATECHTRACOM INSTRUCTORS



MANY ORDNANCE INSTRUCTORS HAVE SEEN ACTION IN THE FLEET

INSTRUCTOR TRAINING SCHOOLS KEEP TOP TRAINEES

LONG ago, the Navy recognized this as a technician's war that would be won by expertly trained fighting men. Before NATECHTRACOM could employ its teaching tools and techniques to turn out technicians literally by the hundreds of thousands, it had to have instructors. Out of that need grew the command's unique instructor training plan. It has been said the NATECHTRACOM way might well set the techniques of vocational education 20 years ahead.

Instructors in a NATECHTRACOM classroom are a far cry from the dour, elderly people who sometimes drilled the public school pupil of yesterday on his three R's. These teachers are young fellows, and a lot of them wear combat decorations. Large numbers of them are hand-picked men who were selected from the training center's own graduates. Many finished their own training, only a short time ago.

Some of the teachers are chiefs and some are men with lower rates. But all have these things in common: they are graduates of the Navy's best and most advanced training

schools, they know the practical side of their specialty as well as the theory, and they are men who show the qualities of leadership—the abilities of a good teacher.

Two Sources Supply Tech Instructors

From two sources, retained graduates and men returned from the Fleet, NATECHTRACOM gets its instructors. Men who look like good prospects are tagged while in school, and a close check is kept on them. Before graduation, they are called before an interviewing committee for final scrutiny. If they pass the acid test, they are assigned to the instructor training program.

Because training now is 75 percent advanced, the demand for instructors has quintupled. Earlier in the war, when most of NATECHTRACOM's program was primary, one instructor could handle a large class. But now classes break down into groups of four or five trainees so they may all work on a given project, under instructor supervision.

TRAINING BLENDS BEST METHODS

SPECIAL training courses for instructors are conducted at all NATECHTRACOM centers. These courses serve two overall objectives: to provide a constant supply of thoroughly trained teachers, and to provide a means for upgrading both instructors and supervisors.

Because few of the prospective instructors were college graduates, their training program needed to be practical in its scope, and designed so that the trainee would not be hampered if he lacked certain educational qualifications. It had to combine the time-tested methods used in schools and universities with the best-proved principles of vocational education.

The training plan that was developed has three major keystones: pre-service (training new instructors), training instructional supervisors, and in-service (up-grading instructors in service).

The purpose of the pre-service phase is to give instructor candidates training in basic teaching techniques. This course comprises 96 hours of instruction and is typical of all three phases. First, it gives 48 hours of instruction in basic teaching methods. The principles of good teaching are discussed, and students take an active part in preparing lesson plans, in putting on shop demonstrations,

and in conducting numerous classroom discussions.

Next, the course takes up the observation and analysis of class and shop activities. This phase consists of 24 hours' instruction. Trainees are divided into groups and are sent out to watch outstanding instructors at work in the various departments, observing their teaching methods. In these visits, trainees carry check sheets which they use to analyze the type of teaching under observation. Sheets cover such points as: "Could his students see and hear clearly?" "Did he make a tie-up with previous lessons?"

Part three of the course gives 24 hours of additional technical training. Instructor candidates go back into the shop and classroom to brush up on the subject they are going to teach when their training period has ended.

Another Instructor Goes Into Action

At the end of pre-service training, the candidate is assigned to serve as assistant to some leading instructor. The "old head" watches junior closely and when he decides his understudy is ready the candidate is given a teaching assignment as a full-fledged instructor.

The NATECHTRACOM system for training supervisors, and for up-grading instructors in service, follows much the same pattern. Here again, as is true with every other phase of training activities, success of the program rests upon two bulwarks—the best facilities available for training combined with teaching designed to produce best results.

INSTRUCTOR TRAINING COURSE WINDS UP WITH ANOTHER TOUR OF DUTY IN SHOPS WHERE NEOPHYTES BRUSH UP ON SUBJECTS



TEACHING TOOLS COMMAND NOW GETS FIRST MODELS

WHEN NATECHTRA COM was established in September, 1942, it had ample station and school facilities. But there was a drastic scarcity of technical material with which to train. No teaching tool for an engine technician can replace the actual engine he must learn to maintain.

Fleet requirements at this stage had top priority, and in many cases production could not meet Fleet needs. A further shortage was in trained personnel to serve as technical training instructors. The Fleet had top priority on these men, too.

Though NATECHTRA COM at this stage of the war found it necessary to use obsolete material (some 10 years old) for training and employed instructors who sometimes felt their way by trial and error, NATECHTRA COM surmounted these difficulties. It managed to turn out personnel who could fit into the Fleet with a minimum of training.

As aircraft output moved into high gear and more new models began reaching the front, there developed a demand for technicians in the Fleet who knew how to maintain this late equipment. One fact stood out above all others: men could not be trained by NATECHTRA COM to maintain a newer model plane, unless NATECHTRA COM had first production models of that same plane with which to train them.

The following equation was proved by battle experience:

Planes + good maintenance = high availability.
Planes - good maintenance = low availability.

First steps to meet the problem were taken by COMINCH in February, 1943 through a letter containing three salient points. Bureau heads were directed to take necessary action to: *a.* have appropriate acts so worded as to provide a reasonable number of first models for training the maintenance personnel and repairmen; *b.* raise priorities for equipment and materials for training centers to AA-1; *c.* replace any obsolete equipment used in such schools.

Early in 1943 a bulk five percent of new production radio-radar material was allocated to CNATECHTRA for training purposes. By an even better provision, CNO agencies began making regular estimates in advance on NATECHTRA COM's needs.

BUORD then established a new policy of allowing CNATECHTRA to estimate BUORD-CONTROLLED aeronautical requirements while the material was in early development, and to give NATECHTRA COM centers high priorities on deliveries.

In September, 1944 a conference was held between CNO, CNATECHTRA COM, BUAER and ASO representatives and, as a result of this, training activities soon were receiving the first production models of engines, airframes, accessories.



MOCK-UPS and other training aids all have a purpose but no teaching device can replace the actual plane or equipment. Men

at NATECHTRA COMS spend many hours performing varied duties, working out problems on operational type airplanes, accessories



CUT-AWAY MODELS FREQUENTLY ARE USED IN TRAINING COURSES



TEXT BOOKS, LECTURES, SHOP PRACTICE ARE ON SAME SUBJECT

TEACHING TECHNIQUE COMBINED METHODS GET RESULTS

GOOD training tools and approved techniques go hand in hand, but NATECHTRACOM found a catch in the word "approved". In brief, there were many conflicting schools of thought on the subject of vocational education. Some educators contended that training films were the cure-all for instruction in things vocational.

Still others held that the answer could be found in mock-ups and working models. Lesson sheets, manuals and straight text books supplemented by classroom lecture with blackboards—all these had their champions.

NATECHTRACOM took the position at the beginning of its training program that all of these things were excellent "crutches" but no one thing was a panacea for the problem of getting across information in minimum time.

NATECHTRACOM mixed all of these methods together in their correct proportion and produced a training technique that combines the best features of each. This system of blending techniques has worked effectively.

Trainee Now Can Buy His Own Library

Realizing that the best system of instruction is one that appeals as much as possible to each of the five senses, NATECHTRACOM approached the training technique problem from two angles. It classified these aids into two groups, FIRST: visual aids; SECOND: instructional sheets.

Visual aids selected for the NATECHTRACOM program included: blackboard, strip film, slides, motion pictures, procedure boards, models, mock-ups, charts, samples, pictures or posters and cartoons, blueprints, projects, bal-optican, tools, supplies and equipment, and the actual unit exploded or assembled.

Instructional sheets adopted for training were grouped into six general classifications: information sheets, job plans, operation sheets, job sheets, assignment sheets manuals, technical notes and orders. All the instructors are specifically trained to employ both types of teaching aids in the most effective manner.

A forward step was the decision that text books of

Aviation Training Courses no longer should be RESTRICTED, and should be grouped by subject rather than by rate. In addition, writing teams were stationed at JACKSONVILLE, MEMPHIS, NORMAN, and 87TH & ANTHONY so the training manuals could be kept up-to-date with new technical advances. Thus, revised courses can be published annually.

Checked for security, the books now can be bought by a Navy technician who sends a small sum to Superintendent of Documents, Government Printing Office, Washington, D.C. In time, most of the 27 different text books will be available, and ship's stores are even starting to stock them. Once there were not enough of these books to go around; now the technical trainee can buy the entire library.



SLIDE PROJECTORS are another useful crutch, but no one aid is a panacea for getting the information across in minimum time

POST-WAR JOBS IN TIME OF WAR PREPARE FOR PEACE

COMPLETE victory still is not within our grasp, and the trail to Tokyo can be a long and bitter one. Until the enemy has laid down his arms, prosecution of the war must hold a paramount place in the thoughts of every Navy man and woman. But while NATECHTRACOM trains its technicians to support combat more effectively in war theaters of the Pacific, the training program is accomplishing, at the same time, another far reaching purpose which in no wise retards the war effort.

Secondarily, NATECHTRACOM is training its men for a peacetime career—one which will be measured only by their own capacities and ambitions. Literally, there are well over 200 peacetime jobs for which these graduates easily are adaptable by virtue of Navy training. Only a few jobs for the larger rates can be listed here.

AEROGRAPHER'S MATE: fire look-out in government forestry, aerographer for commercial airlines, government weather-observer.

AVIATION ELECTRICIAN'S MATE: aircraft electrician, transformer assembler, general electrical wiring, armature bander, electric-refrigerator serviceman, electrician, telegraph installer, telephone-wire chief or telegraph repeater attendant.

AVIATION MACHINIST'S MATE: operator of power and hand tools in a machine shop or factory; drill press or bolt-threader; engine service mechanic, hydraulic field serviceman, airplane inspector, auto or tractor mechanic, aircraft factory worker.

Graduates Qualify For Peacetime Jobs

AVIATION METALSMITH: flanging-machine operator, welder, sheet-metal worker, plumber, steam-fitter, coppersmith or press operator.

AVIATION ORDNANCEMAN: instrument repairman, electrical assembler, spray-gun or projector assembler, gunsmith, radio mechanic.

PARACHUTE RIGGER: seat-pack inspector, canopy inspector, eye-machine operator, zig-zagger, canvas worker, sail finisher, upholsterer, luggage-maker, leather worker.

PHOTOGRAPHER'S MATE: photography instructor, chief

recordist, aerial, commercial or portrait photographer, news photographer, motion picture cameraman, photostat operator, film and sound printer.

RADIO TECHNICIAN: automotive radio serviceman, radio-equipment assembler, television or electronics troubleshooter, public-address repair, transmission or radio engineer, telephone wire chief.

For men in all of these rates, NATECHTRACOM is providing the best possible unemployment insurance for post-war years, and is giving many of them their last chance at schooling before they settle down to earning a living.

Their outlook for the postwar future was well defined in the words of Rear Admiral H. S. Kendall, USN, who, as CNATECHTRA, said, during a nation-wide broadcast April 19, 1945: "It is unassailable truth that planes can be put out of action faster than they can be made and shipped out to the first line. And I am proud to say that very often it has been ingenuity and training of ground and aircrewmen which has enabled our Navy planes to stay in the fight."

By 1945 Over 300,000 Had Been Trained

"These men, the 300,000 that have already been trained by NATECHTRACOM, and the thousands now in training all over the country, are making a glorious contribution to our success against the enemy. But I am also proud that their war-time training is preparing them for peace, as well.

"These men to whom the Navy has given thorough training in electronics, combustion engines, specialized training in all fields of aircraft maintenance and repair, are the men who will return to civilian life well qualified for good peacetime jobs.

"Predictions of developments to come following the war are staggering to the imagination but they have one quality in common: they require advanced technical knowledge in many fields, if they are to be realized. Many of them will be realized. And I am sure that well forward in the ranks of tomorrow's most valued and honored technicians will be found the men who today are serving their country as air and ground crewmen in Naval Aviation. In time of war they are being trained for the peace we all desire and cherish."



TECHNICIANS take pride in their work. When their plane goes out to fight over the broad Pacific, they want it to do its job well



GQ SOUNDS on the carrier but Navy technicians carry on with their jobs below on the hangar deck. They must keep planes flying



NOT VERY LONG AGO these technicians were probably civilians. Today, as graduates of NATechTraCom schools, they are

teamed up with the Navy's fighting airmen. NATechTraCom prepared them for their role in war as well as a good job in civil life

25 YEARS AGO THIS MONTH

Naval Aviation during June 1920

June 1—A new type of aircraft gun will be given its final tests at Bolling Field soon. Mounted on the bow of an airplane, the new weapon fires one-pound shells at the rate of 120 per minute. Shells are fed into the chamber of the gun from a magazine controlled by the operator. The weight of the gun proper is only 129 pounds.

A novel feature is found in the method of sighting. A machine-gun of the type commonly used in airplanes is mounted alongside the barrel of the larger gun. The operator uses two triggers, one of which controls the machine gun, and it is with this he opens fire. Every fifth shot is what is known as a "tracer." When the operator sees from the tracer bullets that he has correct aim, he opens fire with the one-pound gun.

June 2—The U.S.S. *Lardner* has been assigned to duty in connection with tests of an experimental N.C.L. Kite Balloon Winch. Equipment is being installed on this destroyer at the Boston Navy Yards. Upon completion of the installation, the destroyer will proceed to NAS ROCKAWAY to pick up test pilots and a kite balloon in order to carry out the necessary experiments.

June 4—In keeping with the Army Appropriation Bill, it has been decided that the Army Air Service will control all aerial operations from land bases,

and the Navy will have authority over all aerial operations attached to a fleet, including shore stations whose maintenance is necessary for operations connected with the Fleet, for instruction and experimentation and for training of personnel.



1944: DR. HUNSAKER IN POST-WAR CONFERENCE

June 14—The coming summer months will be devoted to two-week flying periods for qualified naval aviators in the Naval Reserve Flying Corps, according to Admiral R. E. Coontz, USN, Chief of Naval Operations. The schedule is provided for four stations that will give 60 aviators practice in heavier-than-air and 20 practice in lighter-than-air every two weeks.

June 15—The Wilbur Wright Memorial Lecture Society, formed in 1912,

invited Comdr. Jerome C. Hunsaker, USN, to deliver an address this year before the Royal Aeronautic Society of Great Britain. Comdr. Hunsaker's address, *Naval Architecture in Aeronautics*, strongly brought out the many analogies that exist between naval architecture and aeronautical engineering.

In addition to thus honoring the U.S. Navy, the Royal Aeronautical Society has elected Dr. Hunsaker an Honorary Fellow. This is the first time such a distinction has been conferred upon anyone not a British subject.

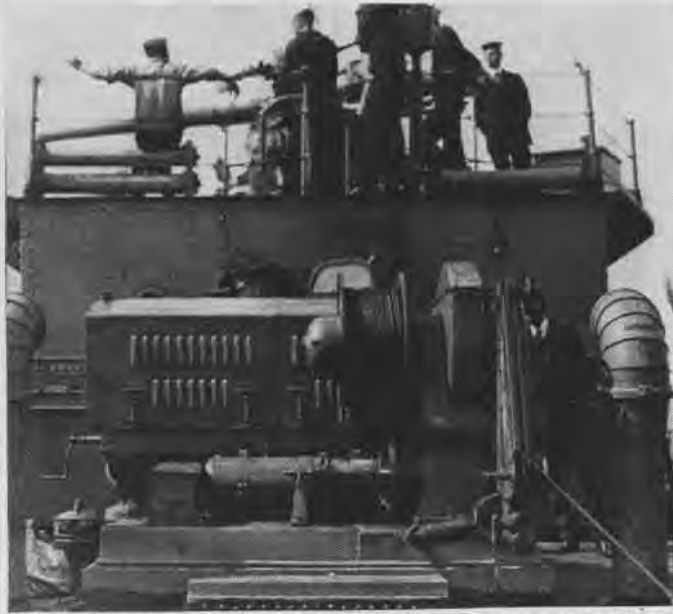
June 17—The world's fastest hydroplane, the Curtiss *Wasp*, recently established a new world's record in recent Navy trials at NAS ROCKAWAY by traveling at the rate of 138 miles per hour. The plane now is the property of the Navy, and will be used at HAMPTON ROADS for training purposes. Former world's hydroplane record was 126 miles per hour, established in the Curtiss HA.

June 21—C-6 and B-18 dirigibles, based at NAS SAN DIEGO, will carry expert government aerial photographers to secure maps and charts of the entire coast line from Mexico to Canada.

June 21—Navy has requested permission from Army to base its fleet air detachment at Mitchel Field this summer. If granted, a force of 16 navy pilots, 100 enlisted men and 16 planes will proceed to base at that field for several months.



EARLY KITE BALLOONS WERE USED FOR SPOTTING, OBSERVATION



N.C.L. KITE BALLOON WINCH WAS INSTALLED ON AN EAGLE BOAT



THE ELEMENTS, NOT THE JAPS, ARE FIGHTING THIS CVE. CREW STRUGGLES TO KEEP PLANES ON DECK DURING STORM OFF LUZON

TROPICAL CYCLONES

THIS is the season—June to October—when the most destructive of all storms occurs with greatest frequency. This is the TROPICAL CYCLONE, a name that embraces hurricanes, typhoons, baguios, cordonazos cyclones and willy-willies, the only difference being geographical location.

The hurricane's favorite striking ground is the Atlantic Seaboard and the area along the Gulf of Mexico. Originating in the doldrum belt (the equatorial region of calms), frequently near the Cape Verde Islands, those hurricanes that affect the North Atlantic and eastern United States move in a westerly direction, usually veering to the north, then to the northeast. These storms often cause tremendous damage to ships caught in their path.

Actual devastation that takes place in any particular locality, as the storm recurves toward the north, is proportional to the distance at which the center of the hurricane passes. Wind

velocities to 140 knots, with gusts estimated to exceed 200 knots, have been observed. Flying debris in winds of such force can be fatal to personnel and can cause staggering amounts of damage to buildings and equipment.

Clouds may be one of the first indications of the approaching storm, the sky often becoming covered with a thin cirrus haze causing lurid sunsets and halos two or three days before hurricane conditions occur.

With the cloud indications, the barometer falls slowly but steadily. The

sea swell increases. The air becomes sultry and oppressive, the weather unsettled and squally. A gradual backing or veering in wind direction with increasingly higher wind velocities and gusts is apparent.

For information on precautions to take before any type of tropical cyclone is about to strike, see COMINCH and CNO Confidential Letter 01818 of 25 May 1944 on *Hurricane and Destructive Storm Weather Information*, ACL NO. 27-44 of 21 March 1944 on *Destructive Storms* and TN NO. 44-43, 11 June 1943 on *Hurricanes*.



This awesome cloud system over a calm sea forebodes the approach of a hurricane, most destructive of all storms. In a matter of hours sea may resemble that in top photograph



PB4Y-2 TRAINER, NOW BEING INSTALLED AT NAVAL AIR STATION, HUTCHINSON, HELPS DRILL CREWS FOR OVERSEAS COMBAT MISSIONS

OPERATIONAL FLIGHT TRAINERS

OPERATIONAL Flight Trainers have been developed by BUAER's Special Devices Division to teach complete crew cooperation on the ground.

OFT's increase the effectiveness of flight instruction by coordinating the skills of pilot, co-pilot, flight engineer, radioman and navigator. They make

possible training in operational procedure under normal conditions and under abnormal conditions where use of operational aircraft is not feasible. The interior of the OFT is equipped with all controls of the actual plane. Instruments register as in operational aircraft. Realism further is enhanced by authen-

tic simulation of engine noises, hull vibrations and the "feel" of controls. A crew can start the plane, make a flight, return and land. PBM trainers have been installed at Banana River, San Diego, Patuxent River and Corpus Christi. F6F-5 and PB4Y-2 trainers also have been produced to instruct crews.

OFT's Check Out Mariner Crews Training at NAS San Diego for Operations in Pacific Waters

PBM CREWS training at NAS SAN DIEGO for Pacific operations are putting the Operational Flight Trainer to its fullest use. The training schedule includes a six-hour flight problem worked out by squadron commander.

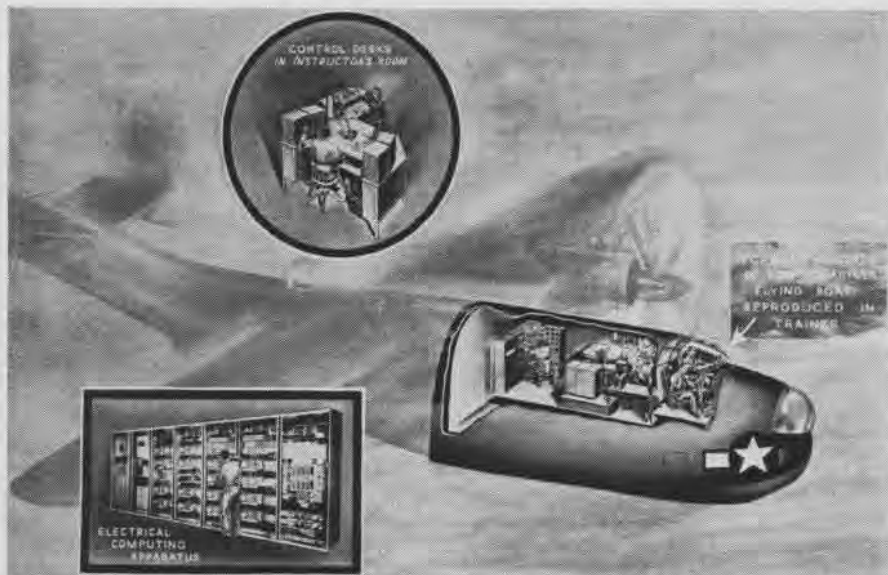
The problem starts with briefing of the crew by the squadron ACI officer. This officer interviews each member to make sure that he has a thorough understanding of his phase of the problem.

The plane commander gets a fly-sheet incorporating a transpacific flight and search mission. The crew checks proper loading, and take-off complies with NAS SAN DIEGO operations control.

Cruise control is stressed for the first time in this trainer. Power settings and fuel flow are watched carefully on a "how-goes-it" chart. The weather problem is based on weather encountered in a recent transpacific flight, the pilot using the standard operational weather chart and report. Wind direction and velocity, temperature and icing conditions are set in by the operator as encountered in each flight zone.

The six-hour flight problem covers each phase of squadron training, including advanced tactics. An enemy task force is contacted first by radar, identified after contact and then shadowed.

Each event and the action taken by the crew are recorded. After the flight,



PBM-3 Operational Flight Trainer is replica of the *Mariner* from the nose to a point just abaft the flight engineer's station, both as to structure and equipment. This type OFT has been installed at NAS BANANA RIVER, SAN DIEGO, PATUXENT RIVER and CORPUS CHRISTI

the problem, including flight logs, charts and coded communications, is returned to the squadron for grading by squadron ACI, communications, navigation and tactics officers. The crew thus knows its abilities.

No crew that fails to reach a standard of proficiency on the problem flights will be cleared for fleet operations. A by-product of the OFT proficiency flights is that weak points in the existing training program are disclosed.

Realism and more practical training are possible by use for the first time of the Radar trainer, Device 15 F, which

provides radar impulses for operational radar gear installed in the OFT. The radioman see realistic radar indications on his scope and the proper range and azimuth as they move across the scope in accordance with related speeds and headings.

The OFT includes the latest model of Loran, which provides a complete checkout for the navigator on the use of the gear in flight and trains him quickly to make in-flight adjustments. Additional realism is provided by simulating partial failure of the gear during flight and by attempts to jam Loran signals.



Pilot and co-pilot at their stations in PBM-3 OFT have all instruments and controls of the real aircraft, insuring realistic training that hitherto has not been possible in ground instruction



Operator's and radioman's station permits the setting up of emergency flight conditions for solution by coordinated crew action and the observation of flight and navigation techniques and errors

SHORE STATIONS

▶ **NAS ANACOSTIA**—Prospective fathers among the station enlisted personnel are benefiting from a new policy of the Anacostia Thrift Shop which is giving layettes away. The first layette went to a seaman for his daughter. The layette included panties, shirts, bands, bib, diapers and all the other paraphernalia of infancy which men know so little about.

▶ **NAS HONOLULU**—"My reason for liking it here will indeed sound irrational but here it goes," said a commander. "Being from New York City, I love this place. I've never been able to appreciate even the beauty of a blue sky, or a sunset before. If it would be possible for my family to join me out here, I'd be content to think of the mainland as nothing but a tourist ground."



▶ **NAAS GREEN COVE SPRINGS**—One young man on this station has been a Seaman for 26 years and he doesn't think he'll ever get over it.

"I don't mind being a Seaman" says Will Seaman, S1c. "Quite the contrary! I'm proud of it! But I'm getting awful sick of being Seaman Seaman. I've been in the Navy 14 months, and sometimes I think they are keeping me a seaman just for the sake of the gag. I'm striking for AerM3c, and if I ever make it a lot of guys will have to get themselves a new joke."

Seaman Seaman takes the incessant jokes about his name with good-natured resignation, but for him one of the beauties of the postwar world will be the unfamiliar experience of being referred to as Mister Seaman.

▶ **MCAS EL TORO**—This station has received approval for expenditure of \$45,000 to increase recreational facilities. Plans call for construction of 16 handball courts, 8 volleyball courts, 7 tennis courts, 5 basketball courts and another wr softball diamond.

Work on the program will get underway as soon as the contract for the job is let, and facilities will be available to both enlisted and officer personnel.

▶ **NAS TERMINAL ISLAND**—The engineering department of VR-3 has come forward with a unique "Goldberg" arrangement which, it is alleged, will remove the unsightly appearance of parachute bags and flight gear that usually clutter the deck just outside the ready room. Without being too specific, the engineering officer reports that this new gadget will take the form of a portable rack on wheels, and all loose gear will be expected to be stowed thereon. The idea of the wheels is purported to

take into account the fact that once in a while it does rain in Southern California, in which case it would be necessary to place the racks indoors.

▶ **NATB CORPUS CHRISTI**—Shoals and reefs are in the life of any sailor, Red Dog, mascot of the aviation cadets, discovered this week.

Red Dog, who has gone his way about the various stations of NATB for more than a year, ran afoul of a station regulation.

The well-known mascot was unable to explain his status to a member of the traffic department, whose duty it is to enforce prohibition against pets running at large.

Red Dog, perforce, was cast into the brig. The cadet regiment lost no time in bailing him out. He now is at Cuddihy Field on temporary additional duty.

▶ **NAS PATUXENT**—An ARM, 34 years of age, will receive a diploma from the high school of his home town. Years ago he left school at the seventh grade to make his way in the world and only recently, through facilities of the United States Armed Forces Institute, he learned that knowledge and experience gained in the last fifteen years might make it possible for him to complete his high school education.

He signed up for the USAFI tests of general education development, averaging better than ninety on all examinations. He then contacted the principal of his hometown high school. The principal notified him that he will be granted graduation and awarded his diploma.

▶ **NAS SEATTLE**—At NAS where people overhaul airplanes, fly in airplanes and hear them in their sleep, their principal hobby turns out to be airplanes. Most of the men using facilities of the hobby shop are working on model planes.

Most of the miniature planes they build are powered with tiny gasoline motors developing about one-sixth horse power. These cost from \$12 to \$25. The planes fly in circles controlled by wires from the ground.

Model plane builders hold aviation meets Sunday mornings in the University of Washington Stadium where they have plenty of room to fly their miniature aircraft. Some of the little planes can reach 100 miles an hour, their builders say.

▶ **MCAS MOJAVE**—An addition to the duplicating room at this station came as a result of Blackie's multiplication. Canine pet of the wr's, Blackie is the common denominator of seven puppies. Subtraction of the "copies" will begin as soon as they are worldly enough to leave Blackie for their assignment to Marine squadrons.

▶ **MCAS EL TORO**—A sergeant of the station guard detachment last week was credited with an official "kill". It was not a Jap. But it was a snake. The sergeant, on shore patrol duty at Laguna Beach, found a three-foot rattler in the back seat compartment of a police car. The snake is believed to have entered the car in the Temple Hills area



when it was necessary to stop for a motor adjustment. The viper, which had seven rattlers, lunged at the sergeant who in turn slammed the door on the reptile, cutting off its head.

▶ **NAS MINNEAPOLIS**—The sergeant was puzzled by a question on the application blank he was filling out at a war housing center. He listed his employer as the U.S. Marine Corps. After careful consideration he put his employer's business as "Exterminator."

▶ **NAS PASCO**—A bluejacket on this base is very sad since his pet pigeon, Hawky Tawky, is missing. The pigeon, apparently a trained bird, adopted by the sailor several months ago, had joined the Navy and had made this station his home. When Hawky Tawky failed to be present for muster for several days, the bluejacket was afraid his adopted pigeon had been injured. When he was making inquiries among his shipmates if anyone had seen his bird, "Haven't you heard, there's a meat shortage on, Mac?" one said.

▶ **VPB-122**—A pilot attached to this squadron has discovered a bomb release mechanism for use on practice masthead bomb drops on water targets which is the essence of simplicity and, the pilot insists, the most accurate he has yet discovered. When making a run the bombs are pickled when the first sea gull rises from the target.

It has not yet been determined by the pilot whether or not the mechanism will work equally well on land targets; however, he intends to indulge in ornithological research into the reaction, time, climbing speed and flight characteristics of birds which frequent land bombing targets. All such data accumulated by this birdman will be shared with the allied services.





ELECTRONICS can save lives

IT'S A rough night for the crew of a *Helldiver* SB2C-4E limping home across water from a strike at a Jap airfield. Storm fronts are closing in, the wind is whistling through half a dozen flak holes, and the gas may not last until their carrier is sighted. It's a tight spot—but if the pilot and aircrewmembers are smart, electronics can save their lives.

Up to now maybe they've thought of their radar, radio and IFR equipment as isolated boxes installed in an airplane for individual, unrelated jobs. Actually, every naval airplane has a line-up of electronic aids that serve as a life-saving team when properly used by the crew in line of real emergency.

For homing to the carrier, the SB2C carries special radio equipment known as the AN/ARR-2 that provides audible signals to tell the *Helldiver's* crew the way home.

As the homing equipment points the way, radar in the *Helldiver* can be effectively used to provide additional information to smooth out rough spots in the path. Piercing through darkness and murky skies, it points out approaching storms and places a map of islands and coastlines on the radar scope to show the pilot his position. How efficiently the micro-wave radar now installed in many carrier-borne planes helps pilots is well demonstrated by recent operational reports from the Fleet.

One of these, the story of how a *Helldiver* pilot used his radar for stormy weather navigation to and from targets in unfamiliar territory, is told in confidential articles in the February issue of the *Confidential Bulletin*, the Feb. 10 issue of the *Digest of Radio-Radar News*, and the February issue of *C.I.C. Magazine*. Pilots wishing to learn more about cloud detection and the use of radar in storms should refer to these articles and ask their electronics officers for other information. Numerous tips on radar navigation are contained in the *Air Navigation Bulletin* and *Operation of Airborne Radar*. Both of these bulletins are published by the office of Chief of Naval Operations.



HAMPTON ROADS ENTRANCE AS SEEN ON RADAR SCOPE AND AS IT APPEARS ON A SILHOUETTE MAP; THE LAND AREA IS SHADED BLACK

Let Radar Help

Radar doesn't fly the plane automatically, of course. It works at its best only for those pilots and aircrewmembers who understand the possibilities and limitations of electronics and have practiced comparing scope indications with true maps until radar navigation feels almost as natural to them as contact flying.

Actually, navigation by radar is a form of contact flying, since a pilot can see a chain of islands or curving coastline through his radar's eyes even though he cannot see them with his own.

Then there's another electronic assistant, the radio altimeter. This device will help the limping *Helldiver* fly over rugged terrain with less chance of cracking up in soupy weather or dipping into the drink. Pilots experienced in the use of the radio altimeter have learned to "fly on the green light."

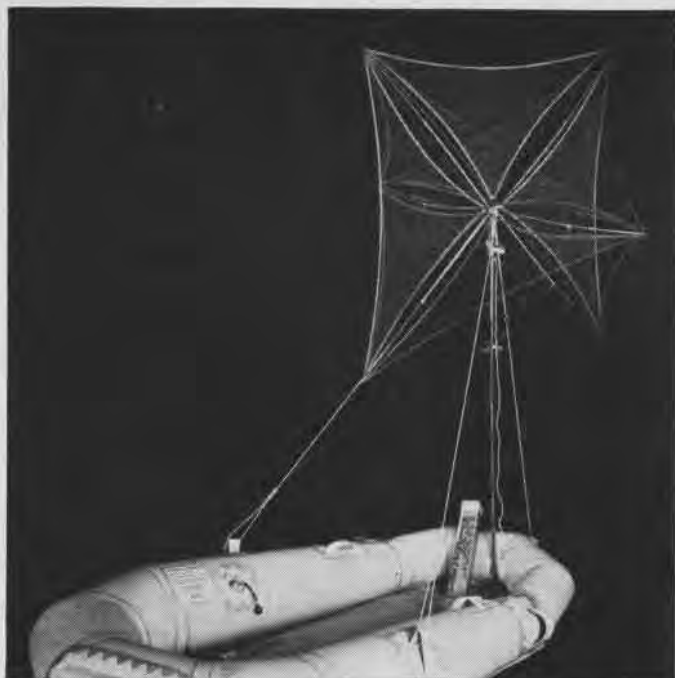
If the pilot decides he can never coax his shot-up plane home, even with the aid of his homing equipment, radar and altimeter, he still has other electronic aces up his sleeve. Calling the carrier by radio would probably be the first step. Also, that emergency switch on the IFF control box wasn't placed there simply to add a touch of red to the cockpit. Flipping it produces a spe-

cial coding on the radar scope of every interrogating station to call immediate attention to a crippled plane's plight. If his own radar and navigational equipment have been damaged by gunfire or flak, the pilot can be vectored home by the mother ship through use of her radar and the aircraft's communication radio.

RADIO range receivers, radio direction-finding equipment, radar direction finders and still other electronic navigational aids carried in certain aircraft also do their part to save lives of aviators and aircrewmembers when in peril. To men trained in reading radar scopes the picture revealed is virtually a map.



Ditched survivor holds "Gibson Girl" radio transmitter between his knees and sends international distress signal; kite holds antenna



With the raft reflector survivors can attract every radar equipped plane for miles around. Larger rafts use a different model reflector

IT'S THE job of these new electronic aids now in production for the Fleet to help aircrews reach their targets safely, to help bring them back to their carrier or base again and, if ditching is necessary, to bring rescuers to them promptly.

After letting their carrier know they are in trouble, the pilot and his aircrewman can ditch the sub with still another life-saver that will summon rescue by means of electronics. The radar corner reflector packed in their raft is the last electronic ace up their sleeve. If the *Helldiver* crew practiced erecting corner reflectors on the ground, they can prepare one for use in their raft almost as easily as they could open an umbrella in a shower.

Corner Reflectors Summon Aid

To help aircrews learn to erect and use reflectors properly, a film, *Airborne Life Raft Radar Reflectors*, MN-4995, has been distributed.

With the reflector in use, they'll provide a target for every radar equipped aircraft for miles around, a target that will give a much stronger radar signal than a rubber raft alone can give. One action report from the Fleet tells of the rescue of 11 men after a corner reflector had attracted an airplane 10 miles away from the raft.

The sub's complement of radar, radio, IFF, altimeter and homing equipment is merely one example of how naval aircraft are supplied with electronic life-savers. Larger planes still have other aids, including the "Gibson Girl" radio transmitter which can be used in a life raft to send out emergency signals and which has already assisted in numerous rescues. If patrol plane personnel will take a few months to study its proper operation, they someday may attract a rescue plane instead of a shark to their life raft. A few hours' practice may save several lives.

Navy Developing Small Gibson Girl

Smaller planes have fewer electronic survival aids. Day fighters, for instance, do not all have radar. However, all combat planes have certain equipment with which every pilot and crewman should be familiar. Since the "Gibson Girl" is too heavy for carrier based planes to carry as standard gear, a new lightweight transmitter-receiver, small enough for any fighter, now is under development.

Because of the confidential classification of some of the equipment supplied in naval aircraft, few details can be published in a restricted magazine. However, the alert pilot and aircrewman will get the word from radio-radar personnel and learn to use electronic equipment to save their lives in the event a real emergency actually occurs.

Restricted

INSTRUMENTS HELP BRING PILOTS HOME



AN/ARR-2 EQUIPMENT PROVIDES SIGNALS TO LEAD THE AIRCRAFT BACK TO THEIR BASE



RADIO ALTIMETER HELPS KEEP PILOT OUT OF TROUBLE; RED SIGNALS WHEN TOO LOW



FLIP OF CODING SWITCH ON IFF TO EMERGENCY SENDS TROUBLE SIGNAL OUT 100 MILES

UNCLE KIM TUSSIE



ACTION REPORT: During the afternoon three low flying aircraft were seen directly approaching this ship from dead ahead. The battle fleet at this time was off the starboard quarter about five miles. The sky was completely overcast with low flying nimbostratus clouds from which light rain had fallen and was soon to fall again. Visibility at the time, however, was good. The three aircraft headed for the Fleet were believed to be *Zekes*; however, identity was not assured visually. All hands were called to battle stations.

As the three aircraft approached close aboard, they altered course slightly to pass abeam to port at about one thousand yards. At this moment No. 23 cal. 50 gun commenced firing without orders and No. 27, 20 MM followed shortly thereafter. At about the same time the aircraft were identified as friendly *Helldivers*. Cease firing signals were sounded immediately. Fortunately, the relative motion of the aircraft was very fast at this time and the firing was not accurate. It is believed that none of the aircraft was damaged.

The view of a *Helldiver* and a *Zeke* approaching head-on are similar and under the circumstances one could not expect a recognition team to distinguish readily between friend or foe. Since throughout the day numerous *Zekes* had been attacking, and then suddenly three *Helldivers* appeared approaching head-on, made it more confusing. Any aircraft, no matter what type, that approached a war vessel in the Leyte Gulf in the manner that these three *Helldivers* did would have been asking for trouble.

HIT seems to me the officer ort to have somethin' to say about who shoots and who don't. Two of his gunners blasted loose without a-bein' told. I've had the same trouble around the still a-holdin' the boys down when they see somebody a-slippin' through the bushes. Sich a sishuasion puts the boys' nerves on edge. Not only wuz thar a mistake made on th' ship but the airyplanes come in the wrong way. They wuz a headin' right at the ship. That's a bad way to behave. They ask fer something they's lucky not to git too much of—hot lead.

REPORT FROM THE FLEET: Last minute changes in air plans often cannot be communicated to rescue submarines. In the attacks against the Philippines of last fall, a rescue sub was directed to be on station. The VF sweep arrived before the sub expected it, and, caught on the surface, was taken under vigorous attack by both our aircraft and surface craft. The sub was forced to submerge, leave the area, and proceed some fifty miles from his station.

IF YE can't re-cog-nize an Amerikan sub-marine; if ye can't tell one of ourn from one of tharn, ye'd better see yer re-cog-nition officer purty dad-durned quick and git a few symptoms of one of our submarines.

ACTION REPORT—An F6F approached formation by diving through a 1500 foot overcast normal to the fleet's course. It was shot down immediately and not recovered. The pilot erred in approaching through overcast, on wrong bearing, in a dive and singly.

HIT reminds me o' the day when Houndshell tried to put the britchen on my mule. He had the collar and the hames upside down. He had th' backband under old Barney's belly and the bellyband over his back. And when Houndshell went around behind 'im to hitch the trace chains to the single tree old Barney whaled loose with his hind foot and walloped Houndshell betwixt the eyes.

"Uncle Kim, whut made that blasted mule kick me?" Houndshell ast when he opened his eyes atter a ten minute sleep under the sweet-peas. "I thot yer mule wuz safe!"

"Ye oughta know how to put a mule's britchen on, Houndshell," I said. "Ye didn't git a thing on right and when ye went around behind his heels he wondered what ye's a-goin' to do to 'im next. He wanted to git you before ye got 'im!"

Jist like whut Houndshell done to the mule, this airyplane pilot done to the ship: He done everything wrong. The way he div at the ship wuz exactly like one of them kamikase pilots would be expected to behave. Jist like old Houndshell, he ast fer hit and ge hot it.

ACTION REPORT—An F4U *Corsair* approached on proper bearing at proper altitude. Ship recognition spotter failed to recognize, reason unknown. His ship opened fire with half a battery of 40 MM and shot down *Corsair*. Pilot recovered. One hundred percent ship's error.

NOT all th' time is hit the fault of the airyplane pilot that he aint re-cog-nized. As ole Grand Pappie ust to say: "Thar's two sides to every question." But in this sishuasion thar aint but one side. The pilot done everything right. Th' boys on the ship done everything wrong. And becaze somebody made a mistke hit cost our Gover-mint a good airyplane and dad-durned nigh cost the pilot his life. I remember back in the roarin' twenties when I's a-goin' with Houndshell to haul a load of herbs to the East Virginy coal miners, Houndshell told me somethin' I never did fergit.

"Uncle Kim," he said as he looked ahead and gripped the wheel, "I've larned one thing about drivin' a car. I've larned to expect the other fellar to do the wrong thing and that's why I believe I've allus had sich a good luck. I've outrun a lot of policemen in three states and I've never had a wreck."

And as I read this report, I think the airyplane had the right-of-way but he lost the argu-mint.

TECHNICALLY SPEAKING

Heavy Bombs Hoisted With Safety

NAS WILDWOOD—A bomb hoisting bar that permits safe handling of heavy bombs without power driven equipment or additional personnel was constructed on this station. The bar is simply the axle, wheels and towing attach-



HOISTING BAR EASES BOMB INTO POSITION

ment of a Mk 2 Mod 1 bomb trailer used as one unit. A piece of iron pipe 15' long and 3½" in diameter was inserted in the towing attachment and bolted into position. To add stability, a 1" x ¼" strap was added (see cut). A 13" piece of chain was used to make the connection with the bomb. Finally a rubber collar was fitted around the handle end of the bar to eliminate the danger from sparking.

[DESIGNED BY ENE, C. A. BETLEYOUN, USN]

Aircraft Clocks Running Short

Current production of aircraft clocks is not sufficient to permit installation in new production aircraft to the extent originally planned. At least one clock will be furnished for each new aircraft for the pilot's use and an additional clock will be furnished for the radio operator's use in multi-engine aircraft.

Clocks to fill vacant panel cut-outs are not likely to be available in quantity until the spring of 1946, and all possible measures should be taken to utilize to the best advantage all available stocks of aircraft clocks. Due to the shortage, available spares have been seriously reduced, and operating activities should not draw clocks from stock to fill a vacant cut-out unless necessary to accomplish a particular military mission.

New Tail Lift Designed for SNB

NAAS CORRY FIELD—A device designed to lift the tail of a SNB was improvised by maintenance department of one squadron here. Bars short

enough to prevent bending would not permit use of enough men to hoist the tail without undue strain and probable injuries to personnel. With the new device, however, one man can raise the airplane high enough to permit placement of a stand under the tail.

Scrap pipe or tubing may be used. Specifications include: 1" gaspipe, 6' force arm, 1½' lift arm, 16" stand, 22" coupling rod and a 5" hinged fork. The tail lift must be designed for use from one side of the airplane only to prevent damage to tail wheel well doors. The device pictured is constructed to operate from the starboard side of the aircraft.

► *BuAer Comment*—The tail-lifting bar is useful for the purpose designed. Since



TAIL LIFT OPERATES FROM ONE SIDE ONLY

there is not enough demand for this type of equipment, it is suggested that where required it be manufactured locally.

Panel Lights Need Many Checks

Pilots and mechanics can prevent cumulative "burn-outs" of lamps in red indirect instrument-lighting panels by making frequent checks to ascertain that all lamps are functioning properly. Replace immediately the burned-out lamps from the spares carried in the spare-lamp magazines in the instrument panel. These magazines should be kept filled so that spares will be available at all times.

A simple and quick method of checking these lamps is to run a finger

around the upper half of the rim of the cutout in front of each instrument dial. If a lamp is operating, light will be cast on the finger from the portion of the dial normally receiving light.

The lamp used is AN3140-328, rated at 6 volts, 0.2 amperes. The 28-volt power supply of the airplane is reduced by means of a resistor to the 6 volts required by the lamps. Voltage drop in this resistor varies with the number of lamps burning; hence, with each additional "burn-out", voltage at the remaining lamps increases, thereby accelerating failure of the remaining lamps.

It is desirable to keep the intensity control turned below "full bright"—the lower the better. This will reduce "burn-outs," and the pilot will find that lower intensity of illumination maintains better dark adaptation.

Rod Shows Navigation Lights

NAS NORMAN—When N2S3 airplanes are used for night flying, the pilot often is unable to see the navigation lights located at each upper wing tip. Peep-holes under each light permit small beams to fall on the lower wing so the pilot can determine whether or not navigational lights are operative. Since



LUCITE ROD RESEMBLES A CANDLESTICK

these peep-holes frequently are clogged, a more positive method of light identification is needed.

An A&R officer at this station in cooperation with a chief aviation electrician's mate developed a ¾" lucite rod to fit into the peep-hole located on each upper wing. The rods project 2" below bottom surfaces of upper wing tips.

One end of the rod was turned down to 5/16" in diameter and secured in the peep-hole with wood glue. Grinding the entire exposed surface of the lucite resulted in light being emitted from all points on the rod instead of the end.

[DESIGNED BY LT, C. L. LYNDEN AND T. F. HANSEN, ACEM]

Carriers

LET NANNEWS
HEAR FROM YOU!



Propeller Tool Prevents Damage

NATB PENSACOLA—A propeller alignment mandrel that has resulted in elimination of damage to cylinder threads during installation has been developed here, resulting in considerable saving of time and labor.

After overhauling the Hamilton Standard two position propeller, piston and cylinder are aligned and propeller is placed in storage. As needs arise in various squadrons, propellers are shipped to them for installation.

During transportation of propellers, pistons and cylinders frequently are jarred out of alignment, and unless care



MANDREL SAVES MUCH TIME AND LABOR

is taken to realign them before installation, the first thread on the cylinder may split. When this occurs, it is necessary to disassemble propeller and modify the thread in a machine shop. Constant damage presented a serious problem until the alignment mandrel was utilized.

The mandrel consists of a "tee" handle and 15° cone seat threaded on one end to fit the piston. It is made in 30° and 40° spline sizes. When inserted in rear of propeller hub, it can be screwed into piston or retaining nut, thereby aligning piston and cylinder for proper installation of propeller on engine shaft:

[DESIGNED BY M. M. MILLER]

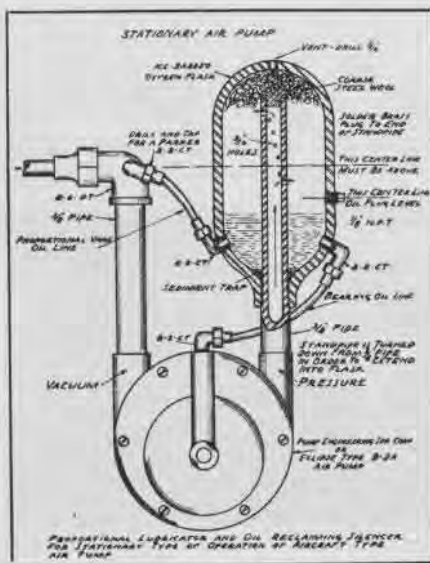
► **BuAer Comment**—This is a simple and very handy tool that can be used to avoid damage to propeller pistons in counterweight type propeller.

NATechTraCom

NATTC Designs Stationary Air Pump

When an aircraft type air pump, as used to drive gyroscopic instruments, is used in a plane, it is driven by a shaft in the accessory section. The pump is lubricated by engine oil pressure. Exhaust air and oil vapor are carried off by an exhaust line.

When used for stationary operation, certain revisions must be made in the pump lubrication and exhaust system. One of the units, developed by the Instrument School research laboratory, has been in constant operation at the rate of 20 hrs. per week on an automatic pilot mockup for



one year with only periodic lubrication for maintenance. At present eight of these units are in operation in the 16 week advanced instrument course.

The unit consists of a 1/2 hp, 220 VAC double-end motor, driving a Pump Engineering Co., type 1P-349-1 gear pump and a type B-2A air pump through a system of universals, mounted on a welded steel bed plate. The entire unit is mounted on four sets of r&w valve springs to reduce vibratory noise.

Oxygen Flask Serves Useful Purposes

Lubrication, silencing of exhaust noise, and reclamation of lubricant are accom-

plished by use of a salvaged ICC-3A2250 oxygen flask mounted on a 1/2" pipe on exhaust port of the pump. The flask is drilled and tapped for two 1/2" pipe fittings slightly above the bottom so that part of flask serves as a sediment trap. About 1 1/2" above these fittings the flask is drilled and tapped for a 1/2" pipe plug. This serves as a reservoir for lubricant and the plug serves as an oil level indicator. A 5/16" hole is drilled in top of flask for an exhaust vent. The 1/2" pipe is turned down to clear the 1/2" pipe threads in the bottom of flask.

Remaining normal diameter of pipe is threaded on both ends. The end of turned down section is capped with an internal brass plug and the section above oil level plug is drilled with a number of 3/16" holes to carry air into flask. The standpipe should extend about 1/2 of the internal length of flask into the flask. Remaining distance is filled with coarse, loosely packed steel wool.

Flask Takes Air and Vaporized Oil

Intake standpipe consists of a section of 1/2" pipe threaded on both ends with a 8-6-DT Parker ell fitted on intake end. This fitting has side drilled and tapped to take a Parker 2-2-CT ell. It is important that this fitting be above oil level to prevent gravity feed back of lubricant when the stationary air pump is not in actual operation.

In operation, air and vaporized oil are exhausted into flask. Because of changes in pressure and direction of air flow, oil remains in flask. Air, in a reasonably oil-free condition, is vented to the atmosphere. A slight positive pressure and gravity act on the oil in flask to supply lubricant to bearing. Positive pressure in flask and negative pressure in intake standpipe, supply lubricant to vanes in direct proportion to vacuum developed. Lubricant and exhaust air then are separated in the flask on exhaust side. Lubricant also serves as a coolant by distributing part of heat to the flask where it is better effected by surrounding atmosphere. Change in direction of airflow through flask reduces exhaust noise and makes unit satisfactory for classroom work.

The lubricating system works equally well where a single-end 1 hp, 220 VAC motor is used to drive a r&w accessory section gear case with two pumps mounted in parallel on case. Application of this unit can be made in any engineering group where vacuum or pressure instruments are tested. Most parts for construction of this unit should be available from salvage. Drawings of the unit are available.

DRIFT METER TRAINER

Cadets at NAAS BODD FIELD, through use of a trainer, now receive a thorough ground check-out on the Bendix B-3 drift meter prior to taking navigational flights. Utilizing a standard drift meter, similar to those currently installed in the squadron's SNB-2's, the mount is attached to a standard SNB seat, duplicat-

ing installation in the plane. Dummy instruments, including compass, altimeter, free air temperature indicator and airspeed indicator, are mounted on a vertical panel and may be set manually by the instructor to simulate any predetermined flight problem.

A photo-mosaic, representing a 15-mile local practice area photographed from 1000 ft., runs as a continuous belt over rollers directly beneath the assem-

bly of desk instruments, seat and drift sight. Cadets learn to read drift, as well as to use the dummy instruments. They may fly wind stars, also determine wind direction and velocity by double drift and track and ground speed. Visual bearings and ground speed checks may be obtained.

[DESIGNED BY LT. A. H. HAIGHT AND LT. (J.G.) T. S. FRANCIS]

IF THE ACTUAL DRIFT
VARIES A LARGE UP OR
DOWN YOUR PREDICTED
DRIFT, ALTER HEADING TO
MAKE GOOD YOUR DESIRED
COURSE

Remember


YOUR HEADING IS NOT ONLY A TRAIL
YOUR HEADING IS LEFT DRIFT & TRAIL

BE ON YOUR FINGER TIPS &
KAYAK, CHANGING AS DRIFT
IS PROBABLY INDICATED
& BEYOND IT - - - - -
DO CORRECTIVE RESULT OF
ALTER HEADING AT ONCE

SPEED AND ALTITUDE

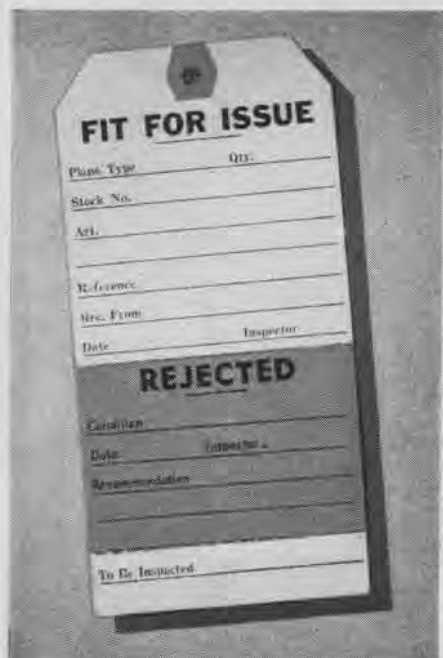
0° TO 50°

GROUND SPEED - DRIFT ALTITUDE
TEST TIME IN SECONDS



AVOID
THIS IS A COMMON ERROR IT
TRUE ALT. - HEIGHT OF TERRAIN
ABSOLUTE ALT.





"FIT FOR ISSUE" TAG INDICATES APPROVAL

Tag Ends Duplicate Inspection

NAS PEARL HARBOR—To eliminate duplication of handling and inspecting material received from forward areas and ships, the following system has been in successful operation at this activity for approximately six months:

1. All material is given a preliminary inspection by A&R and I&S representatives to ascertain which is to be repaired beyond economical repairs. (Allowances are made for critical items.) All items turned in by ships and activities in forward areas are tagged (*see cut*). Items to be scrapped are so marked by I&S inspectors on the REJECTED part of the tag.

2. The tag, printed in two colors, has three perforated sections: a. FIT FOR ISSUE, white; b. REJECTED, red; and c. INSPECTED, white.

3. If items are found fit for issue, the REJECTED and TO BE INSPECTED portions of the tag are removed by the inspector and

his inspector's number is stamped in the FIT FOR ISSUE space. Material then is forwarded to its respective storage section. If material is found unfit for issue, the inspector fills out the REJECTED portion of the tag and removes the TO BE INSPECTED portion. The unfit for issue material is forwarded to the survey and salvage section and held for withdrawal by A&R for repair.

4. When repairs are completed by A&R, the REJECTED portion of the tag is removed, and the FIT FOR ISSUE part stamped approved by the I&S inspector.

To establish uniformity, tags now are being distributed to all salvage areas, A&R departments and naval air stations dependent on NAS PEARL HARBOR.

IFF Mock-up Board Aids NATS

NATS PACIFIC—A portable IFF mock-up board used by VR-13 is believed to be the first of its kind used by any NATS squadron to teach familiarization with the gear. All operating equipment used by pilots and radioman in R4D-5 aircraft



NATS MEN LEARN IFF FROM MOCK-UP BOARD

is included in the mock-up.

It is arranged so that the unit is in approximately the same position as it occupies in the aircraft. Actual operation by pilot and radioman is a feature of the board, together with its mobility. All flight personnel can operate the unit and observe reactions when a fuze blows or the impact unit is tripped.

Such training assures better under-

standing of IFF equipment, and as a result of constant indoctrination, IFF bogeys largely have been eliminated. Two hundred pilots, co-pilots and radiomen have checked out on the mock-up panel in the last three months.

[DEVELOPED BY LT. (JG) ROBERT G. MOORE, MITCHEL CHUTUK, ACM, AND STUART BLAKELY, ARTIC]

Revised Electronics Manual Out

A revised and expanded *Manual of Test Equipment for Airborne Electrical and Electronic Equipment* has been prepared to provide field maintenance activities with information on test equipments now available and those under development. It supersedes the manual distributed in the fall of 1944.

The new manual, CO-NAVAER 08-58-78, is a confidential publication containing information on all items of test equipment presently stocked, under procurement or under development. It covers all test equipment being procured by BUAER for maintenance of radio, radar, IFF, electrical and associated electronic equipment used in naval aircraft.

Revisions, additions and a revised index will be issued periodically in loose-leaf form. The new manual is divided into the following sections, separated by index tabs for the handy reference of user:

Table of Contents; SECTION I—General Information; Test Equipment Lists for Each Equipment; BUAER Test Equipment Plan; Dry Batteries; SECTION II—Power Supplies; SECTION III—General Test Equipment; SECTION IV—Radar Test Equipment; SECTION V—IFF Test Equipment; SECTION VI—Radio Test Equipment; SECTION VII—Special Systems Test Equipment; SECTION VIII—Miscellaneous and Laboratory Test Equipment; SECTION IX—Index.

Activities that do not receive this manual and desire a copy may obtain one by writing the Navy Department, Bureau of Aeronautics, Publications Branch, Washington 25, D.C.



Squadron records of VB-122 are moved easily by means of a portable field desk devised by two yeomen attached to the squadron. Right-hand drawers hold service records and supplies,



while left-hand ones accommodate squadron files. Hinged lids facilitate sealing for travel. Transverse members fasten to box. Developed by G. A. Bruce, CY, and D. K. Hughes.

AVIATION ORDNANCE

INQUIRIES SHOULD BE ADDRESSED TO THE CHIEF OF BUREAU OF ORDNANCE

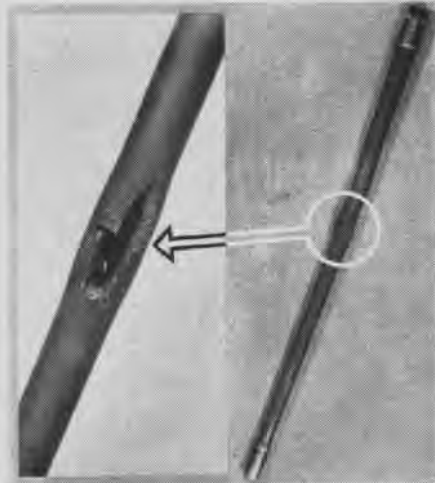
Overheating Causes Gun Barrel Bulges

Overheated gun barrel assemblies for CAL .50 and CAL .30 BAM GUNS, indicated by presence of bulges in barrel, sometimes rupture and cause damage to aircraft parts or personnel. If the barrel fails to rupture when overheated, it usually is damaged to such an extent that tumbling of the projectile results, as well as excessive muzzle blast and a decrease in muzzle velocity.

It has been the experience of BuOrd that ruptures in practically every instance have been caused by excessive heating of the barrel assembly. Continuous short bursts with CAL .50 and CAL .30 BAM GUNS without allowing for complete cooling of

of partial latching will result in inadvertent release.

Another reported difficulty was improper assembly of stirrups and release levers. It was found that the stirrup does not fit flush with the after-side of the release lever, creating a step into which the release pawl may catch, both in latching or attempting to release. Such engagement is not sufficient safely to hold pawl against shock and, here again, inadvertent release will result. In some racks, the irregularities had been filled in with a soft metal in order to present a smooth contour to the release pawl as it passes over the release lever. However, this soft metal will in time be eroded and faulty opera-



OVERHEATING RUPTURED THIS GUN BARREL



RELEASE PAWL CAUGHT IN STIRRUP STEP

holding the bomb too far below the suspension hook.

In order to correct the above difficulties, CASU(F)-40 used two enlarged steadying forks on each rack and adapted them to fit the bomb by slipping a piece of $\frac{1}{2}$ " diameter rubber hose over each steadying fork prong for a distance of about one-half the length of the prongs.

As an alternative, CASU(F)-40 suggested that the regular steadying forks can be used by grinding the rounded ends of the forks off to fit the contour of the depth bomb Mk 54. This modification permits latching the bombs to the racks, gives adequate support, and does not make the forks unserviceable for use with other bombs.

Due to the limited use of bomb racks Mk 41 and Mk 50 types in combat aircraft, it is not considered necessary to provide a new design for the steadying forks. However, Bureau of Ordnance does recommend that interested activities modify these steadying forks as suggested for use with the aircraft depth bomb Mk 54.



RUSTY PARTS ARE CAUSE OF GUN FAILURE

the barrel cause an overheated condition that will approach the degree of overheating obtained by continuous long bursts.

Repeated instructions should be given air gunners when in training on effects of firing long bursts or short bursts with insufficient cooling intervals. Also, barrels should be examined for bulges as often as practicable and if there is an indication of a bulge, the barrel should be replaced.

Close checks on barrel failures should be made and if indications point to faulty barrels rather than excessive heating damage, BuOrd should be advised so that corrective action may be initiated at once by the cognizant authorities.

Inspect Mk 51 Mod 7 Racks For Defects

Several newly issued bomb racks MK 51 MOD 7 have been found to be defective in that they fail to latch properly on activating latching screw. The difficulty was found to be caused by improper location of the latch pin holes in the side plates. This prevented full upward travel of pawl latching screw, and pawl would not fully engage with release lever. This condition

tion is apt to occur, as described here.

All bomb racks MK 51 MOD 7 (stamped N.M.C.O. on side plates) should be carefully inspected for these reported defects, and replaced if found to be defective. Bomb racks in current production (MODS 11, 12) are receiving rigid and thorough inspection, and it is believed similar difficulties thereby will be avoided in the future.

A quantity of these defective bomb racks MK 51 MOD 7 were completely reworked by the Naval Gun Factory and stamped MOD 9. These racks are perfectly satisfactory and should require no inspection.

Sway Braces Modified to Fit Mk 54 DB

Difficulty has been experienced with the sway braces of bomb racks Mk 41 and Mk 50 types when carrying depth bombs Mk 54. This depth bomb is smaller in diameter and does not have the built up attachment found in earlier depth bombs of this series for which the steady forks of the racks were designed. Neither the regular nor the enlarged steadying forks of the racks give adequate support to the Mk 54, and the regular size steadying forks hinder latching the bomb to the rack by

Guns Will Corrode When Not Preserved

Several continental air stations have reported that in some airplanes received for reconditioning, ordnance equipment was not adequately preserved, and in some cases, equipment was beyond repair as a result of heavy corrosion.

Aviation ordnance equipment, particularly aircraft guns, should be preserved in the best available manner before shipment to a continental A&R shop for reconditioning. *Recommended method of preserving guns:* Field strip and thoroughly clean, using a petroleum solvent, if available. Reassemble gun and dip in one of the following preservatives and agitate to assure thorough covering of all parts:

Compound, Exterior Surface Corrosion Preventive, AN-C-52, TYPE 1, thinned with solvent.
Compound, Rust Preventive (thin film), 52-C-18, GRADE 1, thinned with solvent.
Compound, Rust Preventive (thin film), 52-C-18, GRADE 2.
Oil, Lubricating, Preservative, Light, OS-1363.

If none of the preservatives listed are available, use of motor oil or any other substance that will tend to prevent contact between metal and moisture in the atmosphere will assist in preventing corrosion.

LATEST BULLETINS ENGINE, AUXILIARY POWER PLANT, ACCESSORY, PROPELLER 19 May 1945

ENGINE	BULLETIN	DATE	SUBJECT	EXPLANATION
PRATT & WHITNEY				
R-985	176	4-26-45	<i>Piston Ring Arrangement</i>	Includes in one bulletin current and previously approved piston ring arrangements now in service.
	Rev. 1 184 Supp. 1	4-23-45	<i>Push Rod Cover Packing</i>	Includes information on early engines incorporating smaller diameter packing nut at crankcase end of push rod cover.
R-1340	186	4-26-45	<i>Bearing, Rocker Arm—Installation and Removal from Rocker Arm of</i>	Provides information on removal and installation of rocker-arm bearings to avoid plate shield distortion.
	Rev. 1 206 Supp. 1	4-23-45	<i>Piston Ring Arrangement</i> <i>Push Rod Cover Packing</i>	Includes in one bulletin current and previously approved piston ring arrangements now in service. Includes information on early engines incorporating smaller diameter packing nut at crankcase end of push rod cover.
R-1830	307	4-26-45	<i>Fitting of Diffusers and Supercharger Inerts</i>	Provides and allocates parts for incorporation of bulletins.
	Supp. 1 326 Rev. 1 375 Supp. 1	4-26-45 4-23-45	<i>Piston Ring Arrangement</i> <i>Push Rod Cover Packing</i>	Includes in one bulletin current and previously approved piston ring arrangements now in service. Includes information on early engines incorporating smaller diameter packing nut at crankcase end of push rod cover.
	388	4-30-45	<i>Carburetor, Chandler-Evans, Model 1900 CPB-3 Valve Setting on Flow Bench</i>	Insures uniform idle valve positioning during flow bench test, and eliminates necessity of major adjustments in field after installation.
	Supp. 1 381 401	4-20-45 4-18-45	<i>Oil Drain System—Inter-cylinder—New Type</i> <i>Clutch Shaft Assemblies</i>	Familiarizes personnel with new oil drain system. Gives instructions on interchangeability of clutch shaft assemblies manufactured by Pratt & Whitney and Buick.
	404	4-26-45	<i>Ceco Carburetor Setting Change</i>	Assists in rework of carburetors to latest setting specifications.
	405	4-26-45	<i>Bearing, Rocker Arm—Installation and Removal from Rocker Arm of</i>	Provides information on removal and installation of rocker-arm bearings to avoid distortion of plate shields.
	406	4-26-45	<i>Tachometer and Auxiliary Drives—Removal of</i>	Avoids unnecessary disassembly and assembly of parts.
	407	4-20-45	<i>Impeller Shaft Rear Oil Seal Ring Liner—Improved Oil Sealing at</i>	Improves oil sealing at impeller shaft rear oil seal ring liner.
	408	4-27-45	<i>Distributor Finger, Scintilla SF14R(L)N-8 Magnets</i>	Authorizes retention in service of cracked distributor fingers provided they meet qualifications.
	409	4-20-45	<i>Nuts, Flat and Pul Used on Ceco Carburetors—Replacement of</i>	Eliminate leakage of gasoline between main and throttle body and fuel end plates of carburetor.
R-2000	54	4-26-45	<i>Piston Ring Arrangement</i>	Includes in one bulletin current and previously approved piston ring arrangements now in service.
	Rev. 1 83 Supp. 1	4-23-45	<i>Push Rod Cover Packing</i>	Includes information on early engines incorporating smaller diameter packing nut at crankcase end of push rod cover.
	102	4-26-45	<i>Bearing, Rocker Arm—Installation and Removal from Rocker Arm of</i>	Provides information on removal and installation of rocker-arm bearings to avoid distortion of plate shields.
	105	4-27-45	<i>Distributor Finger, Scintilla SF14R(L)N-8 Magnets—Cracking of</i>	Authorizes retention in service of cracked distributor fingers provided they meet certain qualifications.
R-2800	78	4-26-45	<i>Piston Ring Arrangement</i>	Includes in one bulletin current and previously approved piston ring arrangements now in service.
	Rev. 1 114 Rev. 1	4-26-45	<i>Generator Drive Gear Oil Seals—Installation of Liners to Prevent Spinning of</i>	Adds reworking instructions for rear cases with insufficient thickness at location of generator drive, and for vacuum pump adapter assemblies that interfere with oil seal liners.
	141	4-27-45	<i>Water Injection Equipment, Flow Testing of Water Regulators</i>	Includes instructions for flow testing water regulators used on Pratt & Whitney R-2800-18W engines.
	Supp. 1 153 Rev. 1 179	4-21-45 4-4-45	<i>Carburetor Setting Change</i> <i>Booster Pump Body—Torque Indicator</i>	Corrects and clarifies basic bulletin. Gives instructions for reworking upper booster pump body to insure that torque booster oil pressure will be within required limits.
	191	4-19-45	<i>Cylinder Deflectors—Changes In</i>	Informs activities of latest changes in cylinder deflectors on applicable engines.
	194 Supp. 1	4-26-45	<i>Distributor Drive Idler Gear Locking Bolts and Nuts</i>	Informs activities of possible parts interference when complying with original bulletin and states acceptable rework procedure.
	195	4-18-45	<i>Crankshaft Bolts—Use of Improved Design</i>	Prevents crankshaft bolt lock failures and identifies acceptable and unacceptable type lock.
	199	4-18-45	<i>Stud—Starter Jaw—Reworking of</i>	Gives instructions for reworking starter jaw stud in applicable engines.
	201	4-20-45	<i>Crankshaft Front and Rear Gear Rework</i>	Informs activities of rework procedure and correction of galling of crankshaft gears.
	203	4-20-45	<i>Leads, Rigid Ignition High Tension, Magneto to Distributor for Cast Type Ignition Harnesses</i>	Provides information and instructions for installation of rigid leads.
	205	4-18-45	<i>Counterweight Rollers—Precaution Against Interchanging Two Types</i>	Prevents interchanging of non-interchangeable counterweight rollers and resulting crankshaft unbalance.
	204	4-18-45	<i>Reduction Gear Pinion Bearings—Identifying Acceptable Bearing Surface</i>	Identifies acceptable condition of eroded reduction gear pinion bearing surface.
	208	4-26-45	<i>Bearing, Rocker Arm Installation and Removal from Rocker Arm of</i>	Provides information on removal and installation of rocker-arm bearings so as to avoid distortion of plate shields.
	212	4-26-45	<i>Lower Front Cam Reduction Gear</i>	Provides information on location of new timing marks on subject part of applicable engines.
	213	4-4-45	<i>Stromberg PR-58E1 and PR-58E3 Injection Carburetors—Modification of to Include a No. 31 (.1200) Drill Size Channel</i>	Incorporates a channel in carburetors as a safety measure to prevent mixture leaning out in event of a ruptured poppet valve diaphragm.
	WRIGHT			
R-1820	371	4-23-45	<i>The Replacement of Washer, WAC Part No. 27-D118, with Washer, WAC Part No. 27D247, between the Supercharger Clutch Oil Control Springs</i>	Supplies dimensions of parts involved in bulletin.
	Supp. 1 383	4-23-45	<i>Slotted Type End Seal Spacer, Part No. 117547</i>	Supplies instructions on installation of an improved end seal spacer to improve master rod bearings and cylinder barrel lubrication.
	384	4-30-45	<i>Water Injection Power Control Unit—Additional Gaskets for</i>	Provides gaskets to prevent damage to diaphragms at mating surfaces of power valve housing and adapter.
	385	4-4-45	<i>Rods, Master and Articulating Rods with Shot Peened Surfaces</i>	Follows service history of master and articulating rods that have been shot peened instead of polished.
R-2600	160	4-11-45	<i>Guide, Valve Tappet—Elimination of Oil Leakage at</i>	Prevents oil leakage at valve tappet guide.
	162 163	4-7-45 4-27-45	<i>Carburetor, Holley 1685 HAR and 1685 HB—Interchangeability of</i> <i>Hose Clamp and Hose on External Tube from Oil Scavenge Pump to Front Oil Sump—Replacement of</i>	Explains installation and operating differences between HAR model and HB model carburetors. Replaces hoses clamp, WAC Part No. 250D14 and hose, WAC Part No. 2058D28, with clamp, WAC Part No. 5047D22, and hose WAC Part No. 2058D108.

(Continued on Page 45)



FM-2 RIDES ON DOLLY, MADE OF OLD SCRAPS AT PEARL HARBOR



TRAILER CAN HANDLE PLANES WITH LANDING GEAR DAMAGED

Dolly Carries Crashed Aircraft

NAS PEARL HARBOR—Faced with the problem of transporting aircraft with collapsed landing gear, without further damaging the plane, a chief machinist's mate here designed and supervised construction of a crash dolly made from salvaged material.

It has reduced additional damage to non-towable planes during transportation and saved considerable man-hours. It should be noted also that the crash dolly is interchangeable for a number of different types of aircraft, such as

FM, F6F, F4U, TBM, TBF, SB2C, SBD, SNJ, SC, OS2U, GH and NH.

The trailer is simple in construction and design. It consists of a frame or chassis 20' long and 8' wide at forward end and 4' wide at after end. The chassis is made from either 6" I-beam or 6" pipe. On this frame are welded vertically four pieces of 4" pipe 30" long with suitable bracing.

Into each of these stanchions is fitted another pipe, telescoped and adjustable to the required height. To these telescoped pipes are attached two I-beams

8' long, one along each side, in a horizontal position, each supporting a piece of 6x6 wood cut with a camber. The wood is padded to form a cradle.

The empennage is supported by two similar telescoped 4" pipes. A heavy chain woven through a rubber hose to prevent chafing is welded to these stanchions. Front wheels are old SB2C jury wheels fitted to SB2C axles welded into a 6" I-beam 10' long. Tail has two TBM tail wheels and forks sleeved into the chassis. Tow rings are welded.

[DEVELOPED BY A. E. WESTERMEYER, ACMM]

(Continued from Page 44)

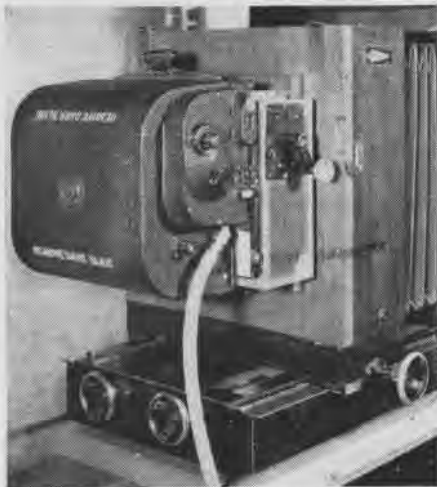
ENGINE	BULLETIN	DATE	SUBJECT	EXPLANATION
R-2600	164	4-26-45	<i>Crankcase, Main Section Parting Surfaces—Re-work of.....</i>	Eliminates oil leakage at subject locations.
General Engines				
	8	4-13-45	<i>Lug, Rocker Box Cowling Mounting—Repair of.....</i>	Provides information on repair of rocker box cowling mounting lugs.
	Supp. 2	4-27-45	<i>Serial Numbering of Aircraft Engines.....</i>	Describes system of serial numbering of aircraft engines.
	17			
	Rev. 1	4-24-45	<i>Engine Parts Disassembled from Engines Involved in Extended Delay in Overhaul—Preservation of.....</i>	Prevents corrosion of engine parts after disassembly of engines.
	27		<i>Shipment of Engines to Overhaul Activities.....</i>	
	32	4-26-45	<i>Spark Plugs—Thread Seizure and Shell Breakage of.....</i>	Recommends that engine log books be sent with engines when sent to overhaul activities.
	Rev. 1	4-20-45	<i>Dielectric Parts—Magnetos—Procedure for Treatment Against Moisture Absorption.....</i>	Furnishes information and instructions that will alleviate shell seizure and breakage.
	49	4-27-45		Provides a universal procedure for treatment of all dielectric parts against moisture absorption.
	71			
Power Plant Accessories				
	12-45	3-14-45	<i>Fuel Pumps, d-22.....</i>	Eliminates possibility of stripping valve and nut threads on disassembly.
	13-45	3-19-45	<i>Fuel System Accessories, f-10.....</i>	Increases effectiveness of rubber "O" ring, Part No. 744108-4
	22-45	4-26-45	<i>Starters, b-22.....</i>	Provides instructions for proper installation and re-use of screw blocks.
	24-45	4-19-45	<i>Air System Accessories, e-7.....</i>	Provides instructions on how to incorporate addition of spring guide bushing in order to prevent valve spring from binding against projections within valve body causing valve to become inoperative.
	25-45	4-21-45	<i>Turbo Supercharger, i-4.....</i>	Eliminates pick-up between thread of the impeller shaft nut and impeller shaft.
	26-45	4-24-45	<i>Starters, b-23.....</i>	Eliminates breaking of jaw meshing lever assembly when operating hand meshing cable.
	27-45	4-26-45	<i>Starters, b-22.....</i>	Improves operation of subject pumps at temperatures as low as 54°C (-65°F) by reducing possibility of bearing seizure.
	28-45	4-27-45	<i>Air System Accessories, e-8.....</i>	Advises activities of proper procedure and technique for overhauling and reconditioning Eclipse engine driven air pumps types 549 and 550.
	9-45	4-15-45	<i>Starters, b-20 Main Motor Bolts in Jack & Heintz JH5 Starters—Change of.....</i>	Corrects torque value given in basic bulletin.
	Rev. 1			
Hamilton Standard				
	30	4-24-45	<i>Hamilton Standard Service Bulletin—Approval of.....</i>	Approves Hamilton Standard Service Bulletin 95.

PHOTOGRAPHY

Modify Copy Cameras for Aerial Film

Increasing demands on many photographic units for production of a large number of copy negatives in a minimum amount of time has led to modification of a standard copy camera for use with aerial roll film magazines. Photographic Squadron Five has reported such an adaptation for copying selected photographs in the field.

Two men working together, one operating the camera and the other changing



ADAPTER BACK REPLACES FOCUSING BACK

copy, were able to average 350 exposures per hour. A similar modification has been used successfully at the Photographic Science Laboratory, NAS ANACOSTIA. The accompanying photo shows the construction.

An adapter back, on which the case drive of a K-17 aerial camera is mounted permanently, is constructed to replace the standard focusing back. A removable ground-glass focusing panel is built of wood and milled to fit the magazine receptacles of the case drive.

The film may be advanced manually by using the hand crank on the case drive or electrically by connecting it to a 24-volt battery. Vacuum for the magazine is provided by a vacuum pump or other available source. (See *Photography Technical Bulletin*, NAVAER 10-1R-72 for further information on this modification.)

Handbook on S-7 Aircraft Camera Out

Handbook AN-10A-12 which covers operation of the Continuous Strip Aircraft Camera, TYPE S-7, has been revised for Navy use and now is being distributed to photographic activities.

New Handbook for 16 mm. Bell & Howell

A new handbook of instructions with parts catalog for the Bell & Howell 16 mm. (Auto Load) Motion Picture Camera, STOCK NO. 18-C-184, now is being distributed to all photographic activities. Additional copies may be requested from BuAer, Publications Branch. Use NAVAER FORM 140 and order Handbook AN 10-10BF-1.

Tests Differentiate Alloy Groups

Extended use in aircraft of aluminum alloys containing zinc (75S, R-303, and 40-E) as the primary alloying element makes it necessary at times to differentiate between these alloys and aluminum alloys containing other alloying elements.

Two tests are available for distinguishing zinc bearing aluminum alloys as a group from other groups such as the copper bearing aluminum alloys. Inasmuch as these tests depend on reaction caused by presence of appreciable quantities of zinc, they cannot be used to identify one particular zinc bearing aluminum alloy from another.

Test No. 1

TEST SOLUTION: Na₂S₂H₂O —480g
NaOH — 40g
H₂O —to make one liter

PROCEDURE: Place about 0.5g of clean chips, drillings, or filings in a 250 cc. of water. Add 39 of NaOH pellets and 15-20cc. of water. Heat until evolution of hydrogen ceases, then boil for five minutes longer. Dilute with 50 cc. of water, filter and add 10 cc. of sodium sulfide solution to the filtrate. A white cloudy precipitate of zinc sulfide will form in filtrate from zinc-bearing aluminum alloys. If filtrate is from other aluminum alloys, solution will remain clear.

Test No. 2

TEST SOLUTION: CdSO₄ —5g
HCl —5cc
NaCl —3g
H₂O —to make 100 cc solution

PROCEDURE: Clean a spot on metal to be tested with carbon tetrachloride or some other oil or grease solvent. Abrade cleaned surface with Crocus cloth or metallographic emery paper, Grade O. To avoid possible contamination of metal surface, use fresh Crocus cloth or emery paper for each test. Place a drop of test solution on abraded area and examine spot after two minutes. If metal is a zinc-bearing aluminum alloy, a dark precipitate of cadmium will be seen on the spot. No appreciable precipitate of cadmium will be observed in the case of aluminum alloys which do not contain considerable quantities of zinc. It is suggested that known samples of aluminum alloys be tested to familiarize the operator with behavior of different alloys under test conditions.

Hand Machine Forms Tube Clamp

NAF TRENTON—A hand machine for forming tube support clamps for radar gear has been developed by a metal-smith at this facility. It may be used for any type of work that requires picking up one or more centers.

The base consists of an 8" circular piece of quarter-inch boiler plate with a 3/8" center hole into which is fitted the lever and various size dies. A series of staggered holes has been drilled in the plate into which is fitted a removable holding pin. A piece of 1"x1"x4" steel stock has been riveted to the bottom for

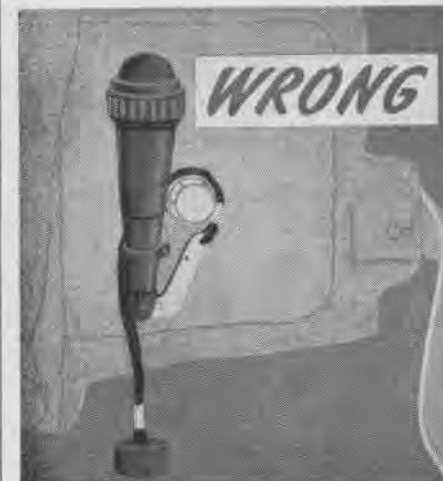


QUARTER-INCH BOILER PLATE FORMS BASE

securing in a vice. This particular machine has been designed to form 1/2" to 1 1/2" clamps and can be modified to form larger sizes.

[DEVELOPED BY W. R. TILLERY, AM2C]

► *BuAer Comment* — Cushioned clamps AN742 should be used for cable bundle supports. Metal clamps are for support of fuel lines etc., would abrade cable bundles.



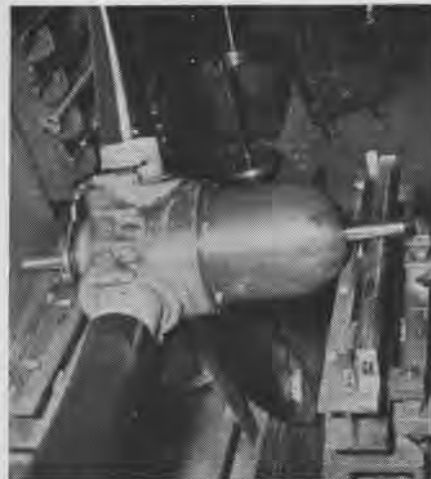
SHORTENING OF the lanyard which operates the CO₂ actuating lever on a life vest has been directed by BuAer Technical Order No. 117-44. Lanyards on life vests already in service shall be shortened so that the distance from the bottom of the lanyard composition button to the lower edge of the life vest is not over 1 3/4" nor less than 3/8". As issued, the lanyards were approximately 4 3/4" long and personnel frequently looped them up around the cylinder mechanism. A man in the water might well forget about looping the lanyard and jerk on it without getting the desired results and decide it was faulty.

SCREEN NEWS

Alameda Eliminates Prop Damage

NAS ALAMEDA—A propeller shock absorber was designed to prevent damage to the knife-edge balancing mandrel and prop balancing arbors.

The incorporation of shock absorbing here on balancing stands eliminates the trouble previously encountered by the mandrels striking the knife edges. This trouble was due to carelessness and difficulty in controlling the overhead cranes. The object of this device is to provide means whereby a propeller, during the process of balancing, can be lowered on the



SHOCK ABSORBER PREVENTS PROP DAMAGE

knife-edge to absorb the shock. In operation the device works as follows:

Before lowering the propeller on the knife-edge, turn the cam lobe up so that it is higher than the knife-edge. When cam lobe is up, there is a binding action which prevents the weight of the prop from kicking the cam lobe down and thus dropping on knife-edge. After the propeller balancing arbor rests on the cam, turn the cam slowly until the arbor is resting on the knife-edge. When tamping lead use cam to raise propeller off knife-edge so that no damage will result.

This shock absorber is definitely an asset to inexperienced personnel who haven't the knowledge of propellers and balancing stands. Mandrels and knife edges are constructed of a fine grade of steel and should be as well protected as precision built instruments. The danger of damaging either the knife-edge or the mandrel is entirely eliminated by the shock absorbers. A great deal of time and money is saved in view of the fact that all possibility of damage is non-existent. It can be used universally in aircraft plants where this type of work is accomplished. It saves the time of refacing the knife edges and mandrels due to rough use which will be overcome by the installation of this device.

[DESIGNED BY JEANNE C. SPENCER]

Defense of an Idea. Since self-preservation is a basic human instinct, we went to war presumably in obedience to that fundamental natural law. We were struck at—we struck back, to preserve our homes, our families, our nation. But the wholehearted vigor with which we are fighting this war has its roots in something deeper than jungle instinct alone. The nature of that something is dramatically demonstrated in:

MA1719g *War Comes to America—Part I*—Unclassified, 65 min.

This film, seventh in the consistently high caliber "Why We Fight" series, tells how it happens that a free people who cherish peace and revere good will can generate enormous power, when the provocation is great enough, in defense of a great humanitarian idea, gradually developed into a way of life by many generations of Americans. A flashback into history shows the birth and growth of the idea side by side with the material expansion of America, culminating in the world's highest standard of living. Then come historic highlights of World War II up to Pearl Harbor, a swift-moving panorama of events—Japanese aggression, rise of Hitler and his idea, ignoble conquests of Mussolini, Civil War in Spain, our Neutrality Act, our gradual renunciation of isolationism, Nazi spy activities, Nazi successes, Lend-Lease, unrestricted submarine warfare, Jap treachery on December 7, our declaration of war. A later film will continue the story from here.

The value of this film lies in its significance as a rock-ribbed answer to any cynic who still may believe the staggering cost of this war in lives, destruction and disruption is not worth the price we are paying.

Ghost Pilot. In this age of mechanical marvels, the automaton to whom the pilot turns over the controls, whenever the need arises, is almost taken for granted. Nevertheless, he is fearfully and wonderfully made, this G-1 automatic pilot, and he now is playing the leading role in:

MC-4333 *Type G-1 Automatic Pilot*—Unclassified, 24 min.

CONTENTS: Cartooning in a light vein illustrates the importance of the automatic pilot in relieving the regular pilot for other duties, such as navigating. Main parts of the gear are pictured—gyroscopic control units, servo-amplifier, transfer valve, servo-cylinders, follow-up units, electric and hydraulic systems. A typical flight shows setting the pilot in operation, adjusting it, overpowering it when necessary, taking it out of operation. Pre-flight inspections also are covered.

Relax! These days, when a fellow can't even count sheep any more because of the meat shortage, insomnia is a particularly unpleasant malady. Wartime tension and combat fatigue have increased the prevalence of insomnia to such an extent that a

motion picture has been made to attack its causes and relieve its victims!

MN-3428e *Insomnia*—Unclassified, 19 min.

CONTENTS: Lucky, an insomnia victim, and his pal, Buntz, both have worries. Buntz is able to ditch his worries, with a little hedging, but Lucky stays with them too long and they wind him up like a spring, tie him into knots and refuse to let him sleep. The narrator steps in at this point and gives Lucky some friendly advice on how to relax by consciously and deliberately breaking the tension in all parts of the body. Following instructions, he smiles and feels the tension leave his face, loosens the knot in the back of his neck, loosens his fingers, fists, arms, shoulders, etc. In short, he lets himself go, breathing softly and slowly all the while. This formula is a surprisingly dependable way to induce sleep.

It is pointed out that while medical help usually is required to dig out the underlying causes of insomnia, the sufferer can do a great deal to help himself by conscious efforts to relax.

Fly High and Breathe

MN-2860 *Fly High and Live—Oxygen Equipment*—Unclassified, 25 min.

CONTENTS: Instructs flying personnel in purpose and use of the diluter demand oxygen system. Points out the external features of the regulator, examines the TYPE 14 oxygen mask, shows operation of the pressure reduction assembly, diaphragm and demand valve, jet nozzle inlet, air valve, oxygen flow indicator and emergency valve. Gives pre-flight check.

Other Films Being Shipped:

MN-83aa *Navigation (Air)—Relative Movement and Interception, Part III—Geographic Sector Search—Relative Sector Search*—Unclassified, 7 min.

MN-4376 *Care and Operation of Gun Cameras*—Unclassified, 22 min.

Where to Get 'Em. Central Aviation Film Libraries and Sub-Libraries are listed below. Check your nearest Library before ordering.

NAVAL	NAS Patuxent
ABATU, NAS St. Louis	NAS Quonset
CASUs 2, 4, 23, 24, 31,	NAS San Diego
32, (F)42	NAS Willow Grove
CASU ComDet., Port	NAS Navy #115
Hueneme	NAS Navy #117
ComAirPac	NAS Navy #720
ComAirSubFwdArea	NATB Pensacola
FAW 15	NATB Corpus Christi
Hedrons 2, 4, 7	NATEC Lakehurst
Hedrons 2, 4, 7, 12, 16	Navy #3233
Det.	TAL Navy #116
NAB Seattle	
NAC Navy #3205	MARINE
NAMC Philadelphia	MCAD Miramar
NAOTC Jacksonville	MCAS Cherry Point
NAS Alameda	MCAS Eagle Mt. Lake
NAS Atlanta	MCAS El Centro
NAS Brunswick	MCAS El Toro
NAS Clinton	MCAS Mojave
NAS Grosse Ile	MCAS Navy #61
NAS Kodiak	MCAS Parris Island
NAS Moffett	MCAS Quantico
NAS New York	MCAS Santa Barbara
NAS Norfolk	4th MAW

LETTERS

SIRS:

Well, I've caught you at it again. Do not get the idea I am just sticking around trying to trip you up, but I am a stickler for accuracy.

Some time ago, the Standard Signal Chart was published and circulated in an effort to try and standardize taxi signals. The signal for LOCK TAIL WHEEL had been to my knowledge standard for years and consisted of interlocking the fore-fingers. This new chart, however, gave an entirely different one consisting of placing hands on top of the head and pressing palms together. I was engaged in flight deck work at the time this came out and tried my damndest to apply this signal, awkward as it was. It reminds one of the old trick as a kid of trying to pat your head with one hand and rub your stomach with the other.

However, if the powers that be say that it is, that's all there is to it, as hard a job as it is to sell to any plane director.

Then, just as some progress is being made, the widely circulated and very well written publication NAVAL AVIATION NEWS comes aboard and right smack on the front cover is a back-slider using the old interlocked finger system, multiplying many heart-rending days of trying to break into the new signal.

The picture was undoubtedly used because it has what photo people call "good composition." Me, I favor a little more accuracy in subject matter rather than any fancy angles, etc.

Let's go back, all of us, to the interlocked fingers, or let's all try and sell the new signal. We could, of course, just leave the tail wheels unlocked, but that would cause some little difficulty, I am afraid.

CVG-84 COMMANDING OFFICER

¶ NANews can't duck this just gripe, and Stickler for Accuracy showed insight in figuring out, approximately, how the picture got into print. Interlocking fingers above head to signify

adopted to make it useful with lucite wands at night, and approved by Navy, Marines, Army Air Forces, Royal Navy and RAF (NANews 3/15/44).

SIRS:

Gail Collier, Flight Orderly, third class, was selected by John Robert Powers, model agency director, for the title of "Miss Patuxent of 1945" in the finals of a beauty contest among more than 500 WAVES at NAS PATUXENT RIVER.

"Miss Patuxent" was chosen on the basis of character, personality and intelligence as well as natural beauty. Her father is an Army colonel. She has more than 500 hours flight time as a flight orderly on NATS planes.

Public Relations Officer

NAS PATUXENT RIVER



SIRS:

Part of the penalty for pilot error in Torpedo Squadron 89 is a poem in which the errant one regales his mates with a lyrical account of his own mishap.

Iambic pentameters, couplets and such poetical niceties as scaming and phrasing don't stand a chance, for it's a strictly doggerel league; but it's good, pithy doggerel and, as the Commanding Officer figured when he instituted the system, impresses the mistake upon the pilot as he sweats out a poem.

Here is an example of Torpedo 89's poetical accomplishments:

TORPEDO SQUADRON 89

NO HOOK!

'Twas on a Friday evening,
A dark and lonesome flight,
When we came across the carrier
And proceeded to land at night.
I flew the circle 'round her,
Neither too fast nor too slow,
But when I hit the flat-top,
My hook was still in stow.
It sure is a helluva feeling
To keep rolling down the deck,
'Cause you'll end up in the barriers
And may damned well break your neck.
I hit the last arresting gear
And came to a sudden stop,
But a three-point attitude I kept,
On two wheels and a prop.
I thought I'd used the check-off list
That's such a helping hand,
But one mental item I didn't recall
Was the hook when preparing to land.

OLD



NEW



LOCK TAIL WHEELS may have been easier because of habit, but something had to be done to make taxi signals uniform, and hands overhead in V, then suddenly brought together was

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ANSWERS TO QUIZZES

● BEST ANSWERS (p. 12)

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

● NAVIGATION PROBLEM (p. 16)

- Lat. 11° 33' S
Long. 160° 28' E
- 0907
- Lat. 10° 24' S
Long. 160° 00' E

(Tolerances: total of 7' on positions and three minutes on time from answers)

● GRAMPAW'S QUIZ (p. 10)

- Aircraft in flight have right-of-way in following order: (a) balloons, fixed or free (an airship not under control is classed as free balloon); (b) gliders, (c) airships, (d) airplanes, including roto-planes.
- Yes. Ref: Art. 6-208 in new BuAer Manual.
- Instruments are subject to failure the same as any other material. When one goes out you must be able to maintain control through a combination of others. Ref: Flight Training.
- No. To avoid engine fouling during taxiing, have proper idling mixture and make periodic engine run-up. Check idling mixture in accordance with T. O. 80-44.
- As tank approaches empty condition, fly level; watch fuel pressure gage carefully and shift tanks as soon as needle starts to fluctuate. Don't forget your minimum altitude requirements — 3,000 feet. Ref: Flight Safety Bulletin 7-44.



Published twice monthly by Chief of Naval Operations and Bureau of Aeronautics to disseminate safety, survival and technical information to the aeronautical organization. CONTRIBUTIONS INVITED. Air mail should be used where practicable to insure speediest delivery of material submitted for publication, addressed as follows: Chief of Naval Operations, Naval Aviation News, Navy Department, Washington 25, D. C.



A TUSSIE ALWAYS LANDS the HARD WAY



Live longer: Identify when approaching friendly ships



SUICIDE-BENT JAP ZERO MANEUVERS DESPERATELY IN A FUTILE EFFORT TO CRASH HIS PLANE INTO THE DECK OF A U. S. WARSHIP

Jap Suicide Pilots

DEADLY AA fire makes suicide a certainty for most *Kamikaze* pilots. Suicide attacks on U.S. Fleet units in the Western Pacific are costing Japan large numbers of airplanes of all types as well as personnel.

NAVY GUNNERS ON ESSEX CLASS CARRIER CHALK UP ANOTHER KAMIKAZE

BLAZING FRANCES PASSES JUST ABOVE CVE'S DECK TO CRASH IN WATER

