

NAVAL AVIATION

# NEWS



U-Boat Survivor—Action by Navy Plane

Cameras Lead the Attack  
What the Japs Think of Us  
Quizzes—Is PBY Human?  
Technical Index—Letters

Oct. 15, 1943

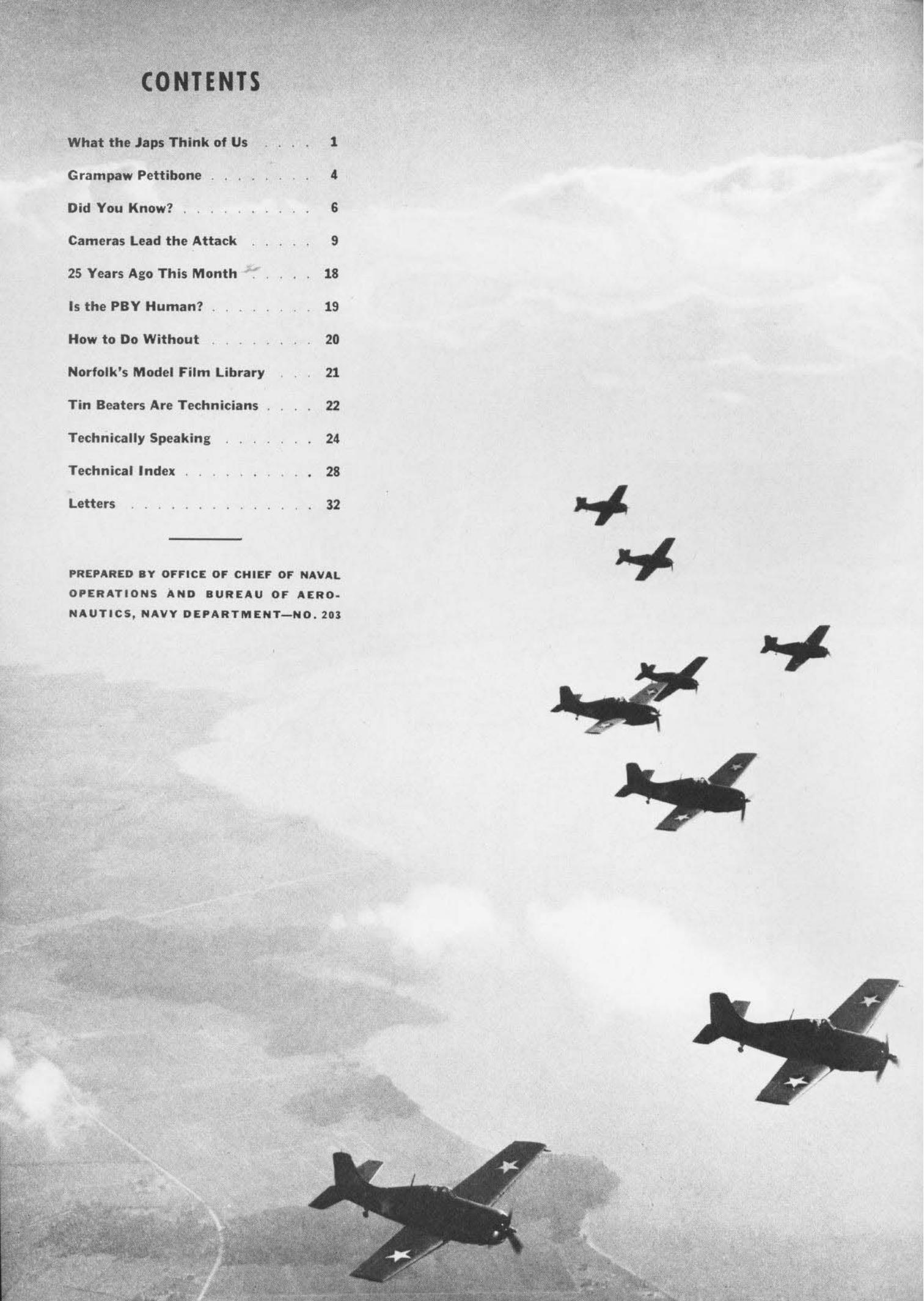
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PREPARED BY OFFICE OF CHIEF OF NAVAL  
OPERATIONS AND BUREAU OF AERO-  
NAUTICS, NAVY DEPARTMENT—NO. 203





# What the **JAPS** Think of Us

**J**UST as Americans had to revise their opinions of the Japanese after December 7, 1941, the Japs have had to re-evaluate us—on the ground, on the sea and in the air. With characteristic hauteur the Jap tries to debunk our fighting men, our tactics, and equipment. Biggest Japanese re-evaluation of the United States has come in its opinion of the American Navy in operation. Progressive upgrading of the American Fleet by Japanese announcements to the world gives an idea of the changing situation in the Pacific since Pearl Harbor:

**May 9, 1942:** "The American Pacific fleet is annihilated. . . . America is reduced to a fourth-class power." [During the Battle of Coral Sea which preceded this announcement, the Japanese, who claimed a smashing victory, lost one aircraft carrier, two aircraft carriers damaged, one

light cruiser sunk, at least 91 airplanes shot down. American losses were one aircraft carrier (*Lexington*) and 27 planes shot down.]

**August 8, 1942:** "The Anglo-American naval force has been reduced to that of a third rate power." [Statement was made after the naval battle of the Solomons, during which Jap losses were: 1 battleship sunk, another damaged; 3 heavy cruisers sunk; 2 light cruisers sunk; 5 destroyers sunk and 6 damaged; 8 transports sunk and 4 cargo transports destroyed. Our losses in this American

**Classed a 'Fourth-Rate' Naval Power after Pearl Harbor, America has steadily climbed in Jap propaganda**

"defeat" were: 2 light cruisers and 6 destroyers sunk.]

**October 29, 1942:** "The American fleet is a second rate power." [A compilation of the total Japanese losses covering the entire war to November, 1942, shows that the Japanese lost 208 ships of all types, of which 86 were combatant ships, with 36 more probably sunk and 169 damaged. American losses were a fraction of this number.]

**August 15, 1943:** The chief of the Japanese Navy Press Section, in a speech to the Japanese people, said: "The American forces do not give our forces even a moment of rest. At first the Pacific War situation centered in this area was like a direct grapple of two economic grand champion 'yokozuna' (wrestlers), and now America, which was defeated at the outset of the war, has finally tightened her helmet strings and has come forward with counter offensives." This reappraisal came after the recent Japanese losses on all fronts, on land and sea and in the air.

Having finally raised the status of the American Navy and fighting strength to that of Japan herself, the Japanese press chief added a few words of encouragement to the Japanese people: "We, as grand champions, must not be excited or impatient over small losses. We must set ourselves firmly and strike the enemy with all the forces within us until the enemy is downed."

**T**HE Jap fighter is a short-legged, long-bodied, awkward little man. He is clever in some things and very dull in others. He is patient, thorough, unimaginative, as brave (and as cowardly) as men of other nations. Like the Nazi in victory, he thinks of himself as a superman. In defeat, which he is now getting a taste of for the first time, he is puzzled and astonished. The American fighting man is not the man pictured in Jap propaganda.

**American Air Power Held Dubious**

Some information has trickled through on the Japanese estimate of our air strength and pilots. In aviation they consider our material is able to play a decisive role, while in fighting, they feel that our "moral inferiority" has more important results. We are good at doing technical things like building planes, but not so good as the Japs at flying planes.

According to reports from Tokyo, via Axis correspondents, America has some good planes, and well-trained pilots. Although air fighting is extremely hard, on both sides, with no quarter given, the Jap boasts that Americans avoid dogfights. [In the early part of the war, the very light Japanese S-00 fighters were more maneuverable than the American P-40D *Kittyhawk* and *Airacobra*; consequently held the advantage in dogfights.]

The best single-seater fighter, according to the Japs, has been the Grumman *Wildcat*, proving superior to any other American fighter type encountered. [More recently the F4U has seen combat in the Pacific area

and currently, the fast F6F.] The P-39 is also described as a machine commanding respect, and so are the Curtiss SB2C *Helldivers* and the *Flying Fortress*.

As regards flying personnel, Japanese airmen are reported to have expressed the view that the American pilots gave proof of long and careful training; they were excellent pilots and accurate gunners, courageous and full of fight. Tactics generally employed by the American fighters were, according to the Japanese, to climb to a height of between 25,000 and 30,000 feet, then make a diving pass at Japanese formations.

"American aviation reconnaissance is generally good," says a captured Jap report, "and so is air-ground liaison. The airplanes, particularly fighters, reconnoiter and make bombing and strafing attacks, and act very aggressively. As the fighters carry out their strafing and bombing at low altitudes by diving, there are frequent opportunities to shoot them down when infantry units can carry out AA firing."

One aspect of American aviation



JAP PRISONER DIGS IN TO WELL-FILLED TRAY OF NAVY BEANS AND SPUDS



NIP CAPTURED IN ALEUTIAN ENGAGEMENT GETS QUIZZED AT OUTLYING BASE

which irritates the Japanese especially, is that our johnnies "execute especially thorough strafing and bombing attacks when they spot the smoke of our Japanese cooking fires." For this reason a special directive was issued to the Japanese absolutely forbidding smoke from cooking fires. In case of cooking at night, firelight must not be allowed to leak out.

### **The American Fighter Rated Low**

From fighting with the Marines on Guadalcanal, the Japanese arrived at an opinion of the American fighter, and American fighting tactics. Official reports, captured from the Japs, give this estimate of the American people.

On the debit side, the American: 1. lacks perseverance, 2. lacks spiritual strength, 3. likes to bat the breeze, 4. takes a long time to do things, 5. is poor at hand-to-hand fighting, 6. is easily overcome in combat when not supported by firepower and is easily made to throw up his hands and surrender, 7. if wounded, the American immediately raises a cry of distress, 8. is very inefficient in night action, and 9. is inadequately trained in reconnaissance.

On the credit side, the American: 1. has a fairly strong national unity, 2. is adventurous and likes novelty, 3. is good in technical matters and is practical, 4. is a good marksman, and 5. is skillful in operating tanks and automobiles. American communication technique is excellent.

The American fighter, according to the Japanese, subscribes to the principle that fire-power is almighty. He neglects the power of cold steel (sword and bayonet), which is the kind of fighting the Jap prefers. "Our cold steel has a decisive force and the enemy fears it greatly."

Slowly it is dawning on the Japanese people that America is *not* being defeated—on the sea, on the land or in the air. Because of the mass of propaganda which has been published regarding American spirit, the average Jap took it for granted that the Land of the Rising Sun had no equals. Now he is having to face the fact that there is another "grand champion" in the Pacific, and that he will have to fight harder and harder.

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**TYPOGRAPHICAL ERROR:** Japanese flying boat was described in Oct. 1 issue as Emily Type 20NPB instead of Emily Type 02NPB.



MARINES USED AMPHIBIAN TRACTORS TO PROVIDE FOUNDATIONS FOR THIS GUADALCANAL BRIDGE

# GRAMPAW PETTIBONE

## Strike One!

This pilot (265 hours) was flying an FM-1. The airplane was observed to be acting sluggish on take-off. At about 100 feet altitude it started to mush in and the pilot made a forced landing in a semicleared area near the field. The airplane turned over and received strike damage; the pilot received only minor abrasions.

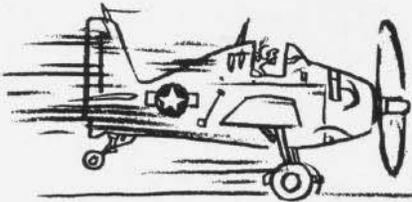
This particular pilot will probably never take off again without carefully checking the position of all cockpit controls, for this accident was entirely his fault; his take-off had been made with the propeller control handle not in the full forward position and with the mixture control handle between automatic lean and the idle cut off position.

## Tow Pilot Warning

Watch that air speed when taking off with a target in tow. Several recent fatal accidents have occurred because inexperienced tow pilots failed to do this very thing! After leaving the ground their planes were seen to enter steep climbs, stall and spin in.

## Precision Landings

Squadron VN12D8-A, Corpus Christi, has come to the conclusion that many intermediate students are not able to land where they want to, nor able to handle the plane safely



after it is on the ground. This was determined from a review of a group of landing accidents, all of which occurred as the result of pilot error. Out of 12 such accidents, 6 were caused by overshooting, 4 by undershooting and 2 by landing off the edge of the runway.



In order to remedy this and make cadets more precision-landing-conscious, all landings on *dual instruction* or *check flights* at two outlying fields have been restricted to the first one-third of the runway. To facilitate carrying out this restriction, white lines and circles have been painted on the fields to define these areas. Cadets who cannot make the required number of such landings do not receive passing grades.

VN12D8-A reports that this added emphasis on precision landing is reflected in increased accuracy and effectiveness on the part of students.

**COMMENT:** The conclusion arrived at, as to pilot error during landings, is correct. However, accident records show that intermediate students by no means have a monopoly on this type of accident. Advanced students and even experienced aviators are running them a close second; in fact, landing accidents constitute the largest single cause of accidents in naval aviation. All of us might well be more careful in our approaches and landings. The system initiated by VN12D8-A is considered an excellent way to drive home the need for greater care in landing.

It is felt that this system might also well apply to primary training on dual instruction or check flights. However, some care should be exercised in stressing this point in the primary stage. The reason for this is that a large percentage of the accidents in the primary stage are due to stalls and spins on landing approaches. It is feared that if

primary solo students attempted to land short, the number of these accidents would be considerably increased, which is highly undesirable as they are the most serious of all landing accidents.

Generally speaking, it appears sound to teach students to make each landing a precision landing as soon as his technique will safely allow such practice. Such instruction should produce a better product and result in fewer landing accidents later in training, as well as in tactical operations.

## Attention Maintenance Crews

Upon application of brakes during a PV-1 landing, a loud report was heard and no reaction could be felt on the brakes. The plane then ran off the edge of the runway and was severely damaged.

Upon investigation, it was found that the loss of brakes was caused by the failure of the main hydraulic feed line leading to the left brake valve. The feed line was forced out of the BT nut retaining sleeve by the hydraulic pressure in the line at the time of the landing.

The Trouble Board recommended that maintenance personnel be warned of the danger of applying too great a torque on the BT nuts.

**COMMENT:** Excessive tightening on these fittings causes the flares to be thinned out and cold worked, which results in their failure.

## Believe it or Not!

Nine men were recently killed in a transport plane crash because neither acting plane captain nor other crew members knew how to operate the emergency release for the main door.

## Have It Treated



Don't wait to have cuts, sprains and bruises treated. Five minutes spent at the first aid station may mean the difference between a permanently stiff finger and a useful hand.

## How to Prevent Nightmares



Whenever you have finished up-keep or overhaul work on an airplane, ask yourself this question, "Would I be willing to fly it that way?" If the answer is "Yes," it will be conducive to sound sleep that night.

## Heave Ho!

Don't lift heavy weights with your legs straight; bend your knees. This will help avoid strained backs.

Be sure of your footing before starting to lift. If your foot slips you may wrench your back or cause a rupture.

Don't laugh or talk while lifting. This relaxes the diaphragm and may cause a rupture.

In lifting, the closer the object is to your body, the less the strain.

## Tell Your Flight Surgeon

A student pilot undergoing intermediate specialized training in VO-VCS was leading a daylight navigation flight over the Gulf of Mexico. While in a climb at about 900 feet, his plane was observed to nose over smoothly in a shallow dive and disappear into a fog bank below. He apparently crashed without recovering from the dive.

During the subsequent investigation to determine possible causes of the accident, two other students testified that this pilot had told them that he had recently suffered attacks of nausea and faintness which he attributed to a bad appendix. He told them that during the course of one previous navigation hop he had almost lost consciousness. In view of this and the lack of evidence to substantiate any other explanation, it is believed that on this occasion the student may have lost consciousness and so lost control of his plane.

**COMMENT.**—This pilot had never mentioned his physical condition to either his flight surgeon or squadron officers. There should be no diffidence or hesitation in consulting your flight surgeon, even though the ailment may appear to be of a trivial nature. Military flying demands physical and men-

tal health. Ailments which may seem not worth bothering the medical officer about are often significant and may produce a definite flight hazard.

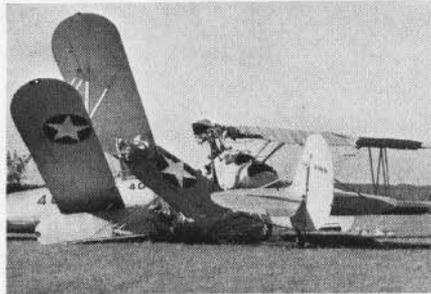
It is far better to report your ailment immediately, even though it may mean the loss of a few days' flying time, than it is to try to "stick it out" and run the risk of losing weeks or months later on; or even losing your life, as this pilot did.

## A Story in Silk

A piece of silk about two feet square, found on the tail wreckage, told the story of what had happened to the pilot. He had bailed out when his plane proved unmanageable after a mid-air collision and had pulled his ripcord too soon. His 'chute canopy had been ripped badly, resulting in a rapid descent and fatal landing.

If the time ever comes when you have to bail out, *don't get excited*. Remember, **CLEAR THE SHIP BEFORE PULLING THE RIPCORD.**

## Non-Rubber Neck



These were the only airplanes operating on a very large outlying field. However, by carefully failing to look around, the pilots managed to taxi into one another.

## Propeller Warning

Patrol 52 invites attention to a danger peculiar to patrol plane operation; the danger to the bow man when making a buoy. This is particularly true when using a large, ship-mooring buoy. Several cases are



## Not a Safety Belt Unless Fastened

During an impending forced landing in a TBF-1, the radio-man was twice warned to be sure his safety belt was fastened. In spite of this, he unfastened his safety belt just before contact, to open the escape door. This one wrong move cost him his life; he was knocked unconscious and drowned.

known where the bow man jumped out on such a buoy to handle the bow lines and was struck by the revolving propeller, as the airplane drifted past the buoy.

The following remedial measures were suggested:

a. Warn crews of this danger and indoctrinate personnel never to jump out on a buoy until propellers are stopped.

b. Always use regular aircraft buoys, where available.

c. In the event bow man jumps, falls, or is dragged from the bow station, pilot immediately should full feather the propeller on that side. This will stop propeller in the shortest possible time. There may be insufficient time for the propeller to full feather completely, but even a partial flattening of the blade will reduce the force of the blow.

## Engine Overhaul By Spoiler

BECAUSE some Spoiler put in oil rings upside down in six out of nine cylinders, which



CAUSED abnormal wear on the upper two rings of these cylinders, which

CAUSED these rings to become badly feathered, which

CAUSED excessive oil consumption;

RESULTED in one SNC being put out of action, following a forced landing.



# DID YOU KNOW?

## Machine Gun Fatalities

### Accidental Firings Have 3 Causes

BuOrd is still receiving various reports on the findings of investigation boards in cases of fatalities due to accidental discharge of synchronized aircraft machine guns.

Analysis of the circumstances indicates that accidental firings have occurred as a result of the following sequence of events:—

1. Live round was in the gun.
2. Master armament switch and selective gun switch were closed, and gun firing switch had been momentarily closed.
3. Airplane propeller was subsequently turned through by hand.

The train of events resulted in firing of the synchronized gun when propeller reached firing position. The reason for firing of the gun is apparent if operation of synchronizer system is understood.

Briefly, when the firing switch was momentarily closed, it withdrew solenoid plunger from notch in cam follower, permitting cam follower (under tension from trigger motor) to move up to a point where, when the solenoid was de-energized by opening firing switch, solenoid plunger could not re-enter notch of cam follower and thus lock it against further movement.

Subsequently, when airplane propeller was turned through by hand, cam and cam follower roller were in contact. Cam follower was free to move until cam reached high point position at which moment solenoid plunger may or may not have re-entered notch of cam follower (depending on strength of solenoid spring). In any event, motion of cam follower

from low cam to high cam position was sufficient to fire the gun.

The most effective way of preventing these accidents is to make sure there is *no live round in the gun at any time* when work is being done on airplane engine or its accessories. It also is best to make sure ammunition belt is not connected to feedway of gun—so that gun will not be loaded by accidental charging—and that no personnel are in line of fire when propeller is being pulled through.

## New Helmets Distributed Delivery to Supply Points Begun



BUAER DISTRIBUTES LATEST PILOT HEADGEAR

BuAer is now delivering the latest type of helmets to central supply points. The following data may be used in requisitioning:

Sizes	Intermediate	Summer	Winter
Small .....	R37-H-1316	R37-H-1326	R37-H-1336
Medium .....	R37-H-1314	R37-H-1324	R37-H-1334
Large .....	R37-H-1312	R37-H-1322	R37-H-1332
X-Large .....	R37-H-1310	R37-H-1320	R37-H-1330

Headset for helmet, identified as type H-1/AR, and ANB-M-C1 microphone for use with A-14 oxygen mask, are shown in the accompanying picture. Both items can be obtained from local stock.

## Photo Film Can Take It Outlasts Expiry Date on Box

Divergent opinion exists among photographic personnel regarding use of photographic film at a date later than manufacturers' expiration date stamped on each container. Many have the mistaken impression that when the age of film has passed this expiration date, film can no longer be used with satisfactory results and, consequently, believe it should be destroyed. This may be true in isolated cases where film has been stored under unusually adverse conditions of excessive heat and humidity for a long period of time, but by far the greater percentage of film can be used and satisfactorily, long after the expiration date.

An interesting example of the keeping quality of film is shown in the following quotation from a letter received from a Pacific Coast supply point: "A South Pacific base returned 6 cases of outdated film which, from all appearances, had been lying on the beach exposed to the weather for months. The local station photographic laboratory took the material, ran tests and found no difference in quality except that the film was approximately one-half a diaphragm stop slower than fresh film of the same type and characteristics. They are using all the film even though it is one to two years out of date." This film received routine handling in storage, packing and shipping, both to and from the South Pacific Area.

**CALLING SQUADRONS**

**Do Your Pilots Wear  
PROPER GEAR**

**The Cover**

Scene on the cover witnesses steadily mounting success Allied navies have won over U-Boat packs in the Atlantic and elsewhere. Naval aircraft plays a leading role in neutralizing this continuous threat to Allied supply lines.

# TOKYO TALKS

Tokyo is conducting an extensive campaign with all propaganda media to proselyte for the Japanese ideology among occupied countries. This column is gleaned from radio broadcasts picked up by monitors in various parts of the world and made available now to NAVAL AVIATION NEWS.

## -To EUROPE

Reflecting mounting Japanese concern over severe airplane losses in the South Pacific, Tokyo reports that the Cabinet has given top priority to the manufacture of machine tools for aircraft production. The broadcast said the Cabinet's decision placed the manufacture of such machine tools on the same level of importance as Japan's "five key industries"—coal, iron, steel, oil, and shipbuilding.

## -To JAPAN

"The longer the war continues, the weaker our enemies will become, and the more certain our victory. Four years of consolidation in Europe, and nearly two years of consolidation and construction in Greater East Asia, have enabled our side to build our positions to such an impregnable extent that we have created puzzling questions for our enemy to solve."

## -To EUROPE

Tokyo has inadvertently admitted that Japanese pilots have machine-gunned American airmen seeking to parachute to safety from planes disabled in combat. In a current broadcast, Tokyo sought to belittle the quality of American parachutes, asserting that when U. S. pilots attempted to 'chute to the ground, their parachutes on many occasions "burned immediately from one shot."

## -To JAPAN

A Japanese broadcaster told his people on September 4, 1943, that Allied troops invading Italy had succeeded in establishing footholds on the Italian mainland. *But "even if the American and British forces did succeed in establishing a foothold in Calabria Province, it will come to an end."* This is because the Allied foothold can be described as nothing more than "an advance post" which will be unable to make any advances against the "large number" of German and Italian troops stationed in Italy.

## -To JAPAN

"Enemy American and Australian forces attack our jungle bases, first of all by raining bombs on us and tearing open the thick jungle. Then, making use of at least 20 times our manpower, the enemy approaches in very systematic order. The enemy has at his command the world's newest type weapons. But our soldiers are not to be beaten easily. They fight with spiritual power. The hardships and physical dangers encountered by our men are not easily imagined."

## SHOW ME THE WAY TO GO HOME

### Dead Reckoning and Celestial Navigation Problem

On March 1, 1943, a patrol plane is ordered to depart at GCT 1400 from its base, Geraldton, Australia, latitude  $28^{\circ}-47'$  S, longitude  $114^{\circ}-47'$  E, to search for an enemy submarine reported in latitude  $26^{\circ}-42'$  S, longitude  $111^{\circ}-09'$  E, flight altitude 4,000 ft., temperature (+)  $9^{\circ}$  C. TAS 116 k. Variation  $5^{\circ}$  W, wind 20 k. from  $065^{\circ}$ . The I. C. correction for the sextant is (-)  $5'$  and the watch is 14 seconds fast.

1. What is the (MH) Magnetic Heading? -----
2. What is the (CAS) Calibrated Air Speed? -----
3. What is the (PGS) Predicted Ground Speed? -----
4. What is the (ETA) Estimated Time of Arrival? GCT -----
5. What is the GCT 1500 DR position? Lat. -----  
Long. -----

Referring to his star chart, the navigator decides to take observations of Canopus, Procyon and Regulus. He determines the following data from these observations:

	Canopus	Procyon	Regulus
GCT	$14^{\text{h}}-52^{\text{m}}-27^{\text{s}}$	$14^{\text{h}}-58^{\text{m}}-10^{\text{s}}$	$15^{\text{h}}-02^{\text{m}}-45^{\text{s}}$
Hs	$52^{\circ}-19'$	$50^{\circ}-56'$	$47^{\circ}-43'$

6. What is the GCT 1500 FIX? Lat. -----  
Long. -----
7. What has been the wind? Force -----  
Direction -----

Continue on track until GCT 1510; change heading to destination.

8. What is the (MH) Magnetic Heading to destination? -----
9. What is the revised ETA? GCT -----

On arrival at destination of original order, a flare from survivors is sighted, estimated 10 miles distant; heading for the lifeboat the magnetic heading is  $185^{\circ}$ . A contact report is made to base. While the plane circled the survivors, they signaled that the submarine had left 3 hours before heading south. The plane departed in search of the submarine at GCT 1600; TAS 120 k.; Cus  $180^{\circ}$ .

10. What is the MH? -----



At GCT 1620 a successful attack is made on the submarine. The contact report is made and at GCT 1645 the plane is ordered to return to base. TAS 110 k, leaving from latitude  $27^{\circ}-34'$  S, longitude  $111^{\circ}-09'$  E.

11. What is the course? -----
12. What is the Estimated Time of Arrival (ETA)? -----
13. What is the GCT 1830 DR position? Lat. -----  
Long. -----

To check his DR the navigator observed the following:

	Moon	Spica
GCT	$18^{\text{h}}-28^{\text{m}}-44^{\text{s}}$	$18^{\text{h}}-37^{\text{m}}-10^{\text{s}}$
Hs	$10^{\circ}-05'$	$70^{\circ}-39'$

14. What is the fix? Lat. -----  
Long. -----
15. What is the revised ETA? GCT -----

(Answers on page 27)

## BEST ANSWERS

### VIII—Math Miniatures

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

1. A 35-foot mooring cable needs to be cut into two lengths so that one part is 7 feet longer than the other. The proper equation for finding the length of the shorter piece is—

- a -  $a - x - (x + 7) = 35$   
 b -  $b - 7x = 35$   
 c -  $c - 2x = 35 + 7$   
 d -  $d - x - 7 = 35x$   
 e -  $e - 2x + 7 = 35$

2. A balloon leaves the ground vertically with a velocity of 400 feet per minute while a wind is blowing at 550 feet per minute. At the end of half an hour the actual distance from the balloon to its starting point will be approximately—

- a - 9,500 feet  
 b - 26,000 feet  
 c - 20,400 feet  
 d - 12,000 feet  
 e - 16,500 feet

3. When height remains constant, the volume of a cylinder is proportional to the square of the radius of the base. If a cylindrical gas tank of radius 12 feet holds 40,000 gallons, another tank of the same height and a radius of 15 feet will hold—

- a - 62,500 gallons  
 b - 50,000 gallons  
 c - 25,600 gallons  
 d - 57,500 gallons  
 e - 65,000 gallons

4. A fighter plane travels as far in two hours as a bomber does in three hours. If the speed of the bomber is 125 m.p.h. less than that of the fighter, the speed of the fighter is—

- a - 425 m.p.h.  
 b - 400 m.p.h.  
 c - 375 m.p.h.  
 d - 350 m.p.h.  
 e - 325 m.p.h.

5. The distance to the horizon as seen from a plane varies directly as the square root of the altitude. If a pilot can see 60 miles from an altitude of 2,500 feet, he would have to rise, in order to see three times as far, to an altitude of—

- a - 4,330 feet  
 b - 266.67 feet  
 c - 7,500 feet  
 d - 546.67 feet  
 e - 22,500 feet

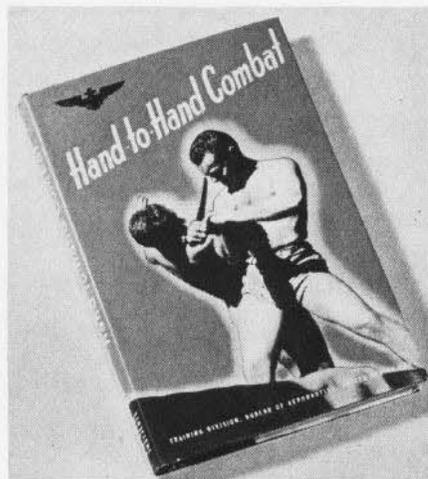
6. The lengths of three pieces of wood are  $4\frac{1}{2}$  inches,  $1\frac{1}{4}$  feet, and  $2\frac{3}{4}$  inches. The total length is equal to—

- a - 21 inches  
 b -  $22\frac{1}{4}$  inches  
 c -  $8\frac{1}{2}$  inches  
 d -  $26\frac{3}{4}$  inches  
 e -  $8\frac{3}{4}$  inches

## 'Hand-to-Hand' Combat Out

### Win at All Costs, Basic Goal

*Hand-to-Hand Combat*, first volume in a series of physical training manuals, prepared by Aviation Training Division and published by U. S. Naval Institute, has been distributed to physical training officers. Brief instructions supplemented by 582 photos describe each of the tactics and maneuvers intended to give the fighting man a knowledge of the deadly weapons he possesses within his own body.



NEW TEXT DEPICTS BODY AS NATURAL WEAPON

Hand-to-hand combat has but one simple objective, it is pointed out. That objective is to *win*. There is no prize for finishing second in a hand-to-hand fight with the enemy. There are no rules; there is nothing "sporting" about it.

Navy men have been in hand-to-hand combat in many places in the war, and the widespread areas over which it is being fought indicate continued probability of their being forced down behind enemy lines, often where their most effective weapons are provided by nature.

## Seaplane Leak Plug Kits'

### Available Now at Supply Points

Several reports recently received by BuAer have requested development of plugs for sealing holes in seaplane hulls. Seaplane plug kits should be available at all central supply points, listed in Standard Stock Catalogue as #R83-P-408500; and should be requisitioned by this number. Each kit consists of 18 varying sizes of plug from 1" in diameter to a 3"x16" size. Details on sizes and construction are contained in Navy Aeronau-

tical Specification P-54 and NAF drawings 47607 and 47810.

## Note to VP, VR Squadrons

### BuAer Corrects Misunderstanding

There appears to be a misunderstanding in some VP and VR Squadrons operating PB2Y-3R airplanes in assuming that, when the outer wing panels of these airplanes are reinforced, wing tip floats of larger displacement and stronger float bracing are to be installed. This is not BuAer's intention. Installation of small floats ceased at the contractor's plant on airplane serial 7153. Airplanes subsequent to serial 7153 have reinforced panels and larger floats installed when delivered. Reinforcement of the wing outer panels merely makes it possible to install either large or small floats with proper bracing on any wing panel.

BuAer is taking action to have the wing outer panels of all PB2Y-3 and 3R airplanes reinforced as rapidly as possible. Until the work is accomplished, large floats and float bracing should not be used.

## Bronze Powder & Corrosion

### BuAer Urges Caution in Its Use

It has been brought to BuAer's attention by an operating activity that bronze powder spilled from a drift signal container caused serious corrosion to the bottom of a seaplane due to galvanic action with aluminum and salt water. To avoid recurrence, extreme care should be exercised in handling bronze powder drift signals (FSSC #88-S-1200), either when stowing in the airplane or when using during flight.

The container of the drift signal has a hole at its nose through which powder is filled. This hole is sealed by means of a porous adhesive tape, necessary to prevent breakage of container due to changes of pressure at various altitudes. Should bronze powder be spilled in a plane, it should be cleaned out immediately.





OPERATIONS

# CAMERAS LEAD THE ATTACK

Naval Aviation News Reports on PHOTOGRAPHIC INTERPRETATION

## Swift Planes with Multiple Cameras Bring Back Pictorial Story of Enemy Ships and Shore Installations; Invading Force Studiously Probes Data before Launching Drive

**M**AINTEINING an up-to-date running record on enemy activity and penetrating his vital secrets are the jobs of photographic interpretation officers. As soon as the enemy starts to build an installation or embark on a tangible course of action, photographic reconnaissance squadrons make a clear, sharp record that is promptly analyzed under the magnifying instruments of photographic interpreters.

Present day forces of the United States and her allies do not have to go into action relatively blind as to what to expect from the enemy, as has often been the case in other conflicts. In previous wars intelligence data were made up of reports from visual observation, intercepts, prisoner interrogation, and spies, all of which were filled with the vagaries inherent in such sources. By using the modern intelligence process of interpreting aerial photographs, a

clear report can be had in as little as six hours after a photographic plane has flown over the enemy. If urgent, special methods can be employed which require even less time to produce a photographic intelligence report, than it takes the plane to fly over the objective and return to base.

Through scientific methods the photographic interpreter can watch the enemy's every move. A record can be kept of what he has done and how long it took him to do it. From this record his future moves may be anticipated, thereby robbing him of the all important element of surprise. With photographic reconnaissance and interpretation, commanding officers have the same advantage in waging war that a person would have in a poker game if he could see his opponents' cards.

Photographs reveal enemy forces and engaging forces then can be ad-

justed to accomplish desired results. Unnecessary effort is kept at a minimum, permitting maximum use of our forces. Weaknesses of the enemy are revealed. Leaders can judge where and how much it will take to overcome him. Or should it be shown that a position about to be attacked is practically impregnable, another place can be sought, thus avoiding unnecessary losses in men, time and materiel.

Photographic reconnaissance has changed attacks from hit-and-run affairs to devastating bombardments of important objectives. The camera has become an important weapon, and photographers and interpreters are voted among the Navy's most valuable men.

### Evolution of Photo Reconnaissance

The evolution of the modern science of photographic intelligence makes a lively story. There was a small beginning of photographic reconnaissance during World War I. Pictures were sometimes taken from anchored observation balloons, and occasionally by hand-held cameras from operational planes, but they revealed little information. British and French armies used data obtained by photographic reconnaissance toward the end of World War I, and most likely the Germans did also. Data supplied were mostly tactical and showed trench layout, location of strong points of resistance, and nearby communication lines. Attempts at interpretation were made in the field close to the front. There was no try at strategical interpretation.

Units were disbanded after 1918, and during the following years practically no attention was paid to development of photo reconnaissance units, particularly by U. S. or Britain. This condition prevailed through the first part of World War II . . . up until June 1940.

Then, following Dunkirk, aerial reconnaissance was forced on the British as the only remaining method of getting information about the enemy. With the fall of France and the Low Countries, military intelligence reports could no longer be ob-



SNUG JACKETS KEEP ELECTRICALLY HEATED CAMERAS IN 'GOOD CONDITION AT HIGH ALTITUDES

tained from the usual sources such as spies, neutral government representatives and paid civilian observers. The Germans soon wiped out secret radio stations that attempted to operate in various parts of the continent.

#### **Commercial House Had Been Dabbling**

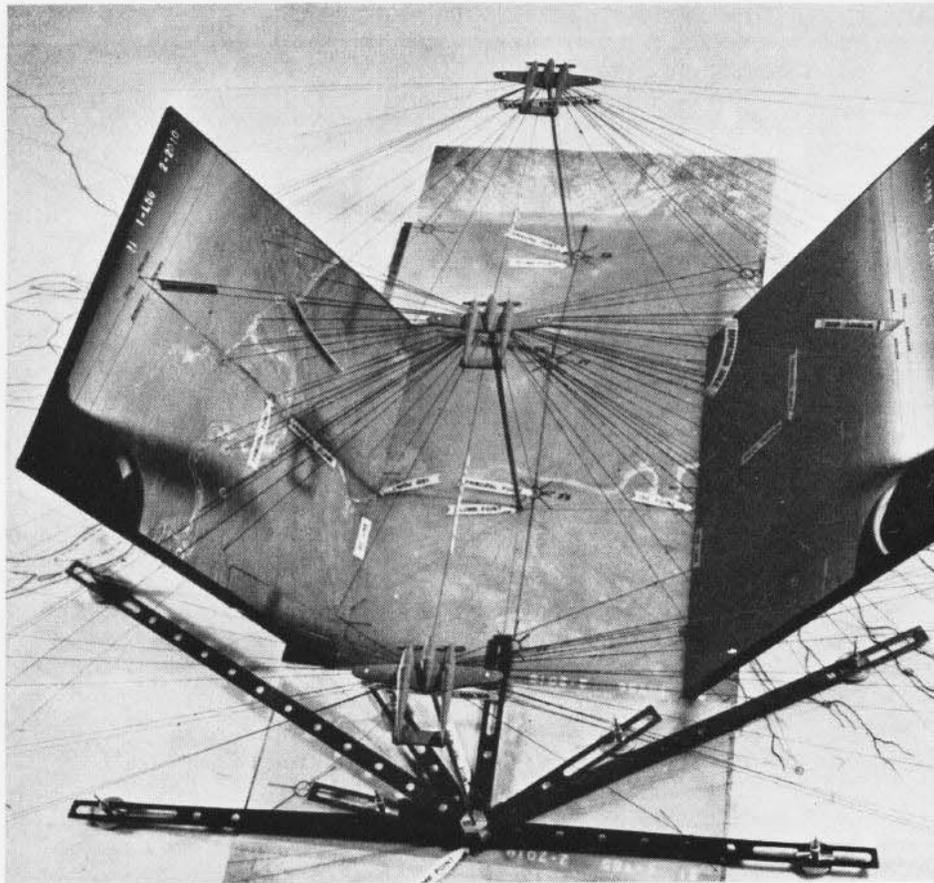
Fortunately for the British, a commercial concern had been developing aerial photographic reconnaissance. RAF took over and a start was made by a group of 40 interpreters and four aircraft equipped with cameras with eight-inch lenses. Intelligence authorities remained skeptical of how much military information could be supplied by photographic interpretation. At the time they believed that information received would be meager at best. The system was more of a make-shift than anything else until spy traffic and other "standard" procedures could be reopened.

However, as the skill of the interpreters increased and the military intelligence supplied in this manner was substantiated by the old "approved" methods and current events, skepticism decreased. The old slow *Lysanders* and *Blenheims* which were shot down too frequently were replaced by the superb *Spitfire*. This plane was stripped of guns and radio and fitted with powerful, new cameras with focal lengths up to 24 and 40 inches. Pilots took special training in photographic flying. Their only protection was speed and high altitude. Extra tanks were added which permitted flights of 1800 miles round trip.

In the United States, aerial photography started in 1914 at Pensacola. The camera was just the ordinary box type enclosed in a cigar box. During the period between 1918 and 1940 a considerable amount of improvement was made in cameras but practically nothing done about interpretation. There was no occasion to use aerial photography for obtaining military intelligence, except for map and chart work. Lumber companies used it for timber surveys, and a limited number of other types of surveying was done by aerial photography.

#### **Started Rolling After Pearl Harbor**

Military photographic intelligence became a necessity for the United States when the Japs attacked Pearl



PLANE FLYING STRAIGHT COURSE GETS ONE VERTICAL AND TWO OBLIQUE SHOTS OVER WIDE STRIP



CAMERA IN CENTER SHOOTS VERTICALLY DOWN, THOSE ON SIDES OBLIQUELY TO HORIZONS

Harbor. American naval and marine officers had been studying it in Britain for some months before December 7, but when Pearl Harbor was attacked, it became apparent that a good part of the war would be fought in the Pacific. This meant that this country was up against a tough proposition from the standpoint of basic intelligence data and operating charts. Many of the islands in the Pacific, though shown in a chart index, were mapped inaccurately. Little or nothing was known about some of them, and photographic reconnaissance and interpretation was the source of information.

Promptly following the attack on Pearl Harbor, the Navy organized a photographic intelligence system. A school of photographic interpretation was established at Anacostia—where it is still operating—on January 1, 1942, just three weeks after Pearl Harbor. It has graduated some 400 officers.

A primary need of photographic intelligence is good photographs made with highly developed equipment, processed by expert personnel. A second is trained interpretation officers supplied with necessary mechanical aids. Where a human secret agent can direct his attention to only one objective at a time, an aerial camera with the single click of its shutter can observe everything within a number of square miles, depending upon lens and altitude. It freezes the view and permits detailed study until all information has been dug out. With special filters the camera can penetrate haze that would baffle the human eye.

By using special equipment the camera can also operate effectively at night. As an example, the natural protection of darkness is naturally used by enemy military leaders for important secret moves. But controlled flash bombs light up this movement and the camera records it.

"To the untrained eye, the aerial photograph is a confused patchwork of the landscape's major features reduced smaller than the Lord's Prayer on a pinhead." A person trained in understanding images on the photograph and skilled in reporting must translate the data into usable form. He generally starts by preparing some kind of map with vital points indicated. This is described in a

written report outlining unusual activity with a conjecture on its military significance.

#### **Other Information Completes Picture**

To have a clear idea of interpretation, it is necessary to understand the other methods of obtaining information. Three main sources are:

1. Wireless interception.
2. Interrogation of prisoners (which sometimes provides useful information).
3. Interpretation of aerial photographs.

Other sources include neutral observers, such as journalists, attaches at embassies in neutral countries, enemy newspapers, journals and propaganda films, and paid agents.



**MAGNIFYING GLASS MAKES DETAILS JUMP OUT**

A good interpreter must have, first of all, a knowledge of what he is looking for, what it looks like, and how it works. He must know the enemy's country economically and physically, its industries, communications and terrain, etc. He must know its life as it is today, and keep well informed on the total war situation.

In his schooling at the school of photographic interpretation, he is drilled in the characteristics and composition of various industries, airfields, railways, and other inland transportation, warships, shipbuilding, general shipping, radio, camouflage, gun installations and armored vehicles, bomb damage assessment, and decoys and dummies.

With this background and continual scrutiny of photographs over a period of time, he should become a first class interpreter provided he adds continually to his general knowledge.

A photographic interpretation of-

ficer: 1. Receives records and collates aerial photographs from all sources. 2. Provides by interpretation maximum information from aerial photographs in minimum time. 3. Prepares and reproduces intelligence data into concise, usable form.

The photographic interpretation officer is aware of his big responsibility. He knows that a false statement may cause unnecessary and, sometimes, fatal action. He cannot be afraid of admitting doubt on any point.

A trained photographic interpreter makes his study in a short time. For example—a photographic reconnaissance plane leaves a carrier, flies to the area it is ordered to investigate (may be five hundred miles away), takes photographs, returns to the carrier. As soon as the plane lands, photos are processed and immediately studied.

In some cases, the men do "flash reporting" when information contained in the photographs is of vital and immediate importance. "Flash reports" can be made upon examination of wet negatives or wet prints, depending upon nature of subject. These reports can be prepared within an hour after a photo plane lands.

Not all the necessary information can be taken from photographs in an hour or two, but "flash reports" are frequently valuable. They may show—as actually happened—that what had been previously reported from visual observation as a "carrier" was only a "different kind of cargo ship." Such a difference in type of vessel is vital and no guess work can be permitted in such circumstances.

Another example—The photo plane may have sneaked in behind the enemy, popped out of the clouds, over an enemy task force, shot two or three photos and quickly returned to the protective covering of the clouds. Back at the base or on the carrier, the photos can be studied in detail and complete knowledge furnished for future action.

#### **All Information in Usable Form**

In the "detail" section of the report, complete information is given about types of aircraft and exact location of anti-aircraft defenses. The same is true of reports on shipping. The interpreter gives type and name of each vessel shown in the picture.

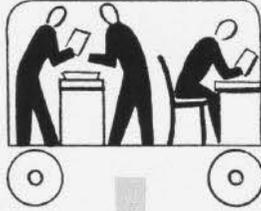
# PHASES OF PHOTOGRAPHIC INTERPRETATION FOR COMBAT



PHOTOGRAPHIC RECONNAISSANCE

## 1st PHASE

INTERPRETATION  
MOBILE PHOTO. LAB.



CHIEF P.I.U.



TERRAIN MODEL  
CONSTRUCTION

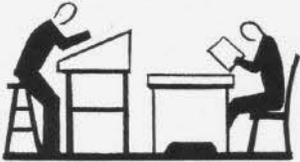


TACTICAL UNITS



AIR FORCE  
COMBAT COMMAND

## 2nd PHASE



PLOTTING PHOTOS ON  
INDEX MAP DETAILED  
INTERPRETATION

## 3rd PHASE



ARMY

NAVY



AVIATION

INDUSTRIAL

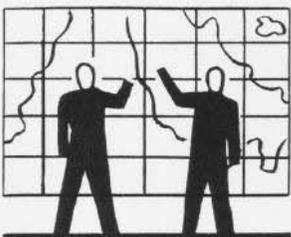
SPECIALIZED STRATEGIC INTERPRETATION



GRAPHIC  
PRESENTATION



FINAL  
INTERPRETATION

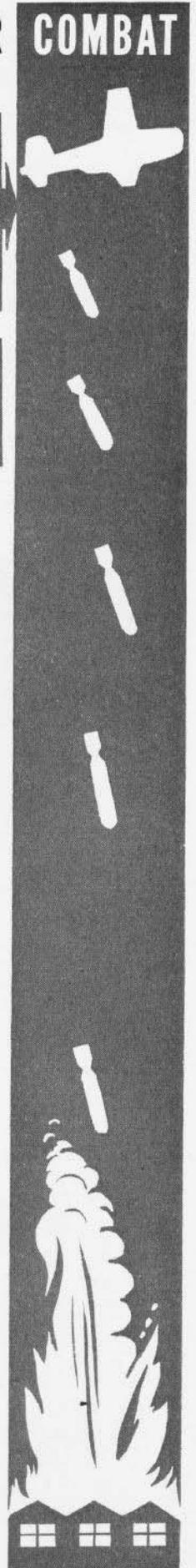


WAR ROOM



AIR ESTIMATES AND  
OBJECTIVE FOLDERS

NAVAL AVIATION NEWS CHART



# CAMERAS LEAD THE ATTACK

[continued]

## 1st PHASE

### PREPARING FOR STRIKE

Taking and reading aerial pictures, and getting the secrets they reveal to combat forces, are the jobs of photo interpretation units that precede a bombing attack.



**1** PHOTOGRAPHERS and crew are briefed before starting on mission over uncharted enemy territory in PB4Y used when large scale photo coverage is desired. P-38's, B-17's and other plane types also are used for reconnaissance



**2** BOMB BAY is loaded with cameras, instead of bombs, on a mission



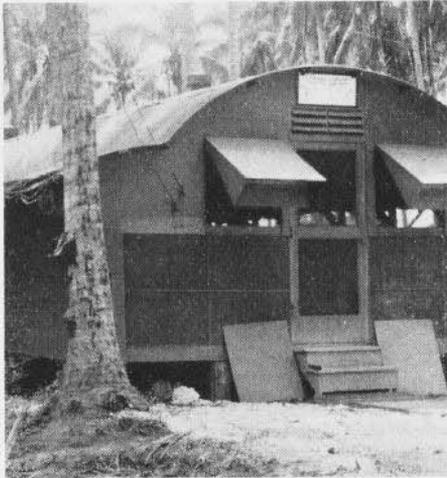
**3** OBLIQUE shots are taken of Jap targets through the waist ports



**4** GUNNERS stay on alert for Japs who pounce on any "lone wolf"



**5** DARK ROOM set up aboard plane develops negatives, makes prints



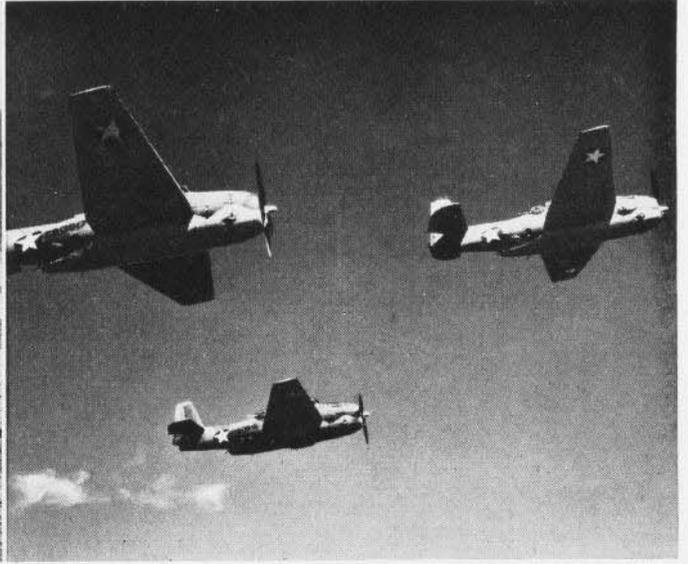
**6** QUONSET HUT serves as photo interpretation unit headquarters



**7** 1ST PHASE interpretation reveals important enemy fortifications



**8** BOMBS are loaded in Navy TBF's for immediate strike based upon reconnaissance report of enemy activity



**9** FLIGHT of bombers streaks through sky to blast targets analyzed in photos taken earlier in the day



**10** STRIKE climaxes work of first phase interpretation

MEANWHILE ...

## PREPARING FOR INVASION

WHEN strategy in any theatre of action calls for invasion, photo interpretation units are asked to supply all topographical data, including scale maps, contour maps, relief models, information on enemy defenses and activities. This requires detailed study in the Second and Third Phases of interpretation, in which trained officers search aerial photographs to furnish exact information on enemy positions, installations, concentration of forces, etc. Ordinarily, at the end of the Second Phase, which gives units commanders detailed reports on what is found, interpretation officers have completed

their job. Photos then can be filed for comparison with pictures taken later. But when large scale offensives are planned, the unit prepares specialized strategic interpretation and graphic presentation aids in the Third Phase. Maps then are drawn of uncharted areas and contour maps traced with the aid of a device known as the Contour Finder, which uses two overlapping photos to determine the exact contour of the area. This information later may be utilized in making relief models, use of which aids in making detailed invasion plans, acquainting officers and men with actual terrain features over which they will be operating. Photo interpretation guides strategy.

# 2d 3d PHASES



**11 STEREOSCOPIC** study continues, magnifying overlapped prints to bring out three dimensional effect



**12 SKETCHMASTER** projects negative on paper where it is traced to form scaled map of enemy territory



**13 MOSAICS** prepared by matching overlapped prints in long strips give the complete picture of area



**14 RELIEF MODELS** for operational use graphically present topographical data supplied by air photos



**15** INVASION plans based on photo interpretation findings and intelligence from other sources call for close coordination of air and amphibious forces as well as all service branches of the Army, Navy and Marine Corps



**16 BEACHHEAD WON**

# 25 YEARS AGO THIS MONTH

## Naval Aviation October 1918

*October.* — Northern Bombing Group cooperated in the attack of Allied armies in big push. They did ground strafing and low bombing, and made continuous raids on enemy concentration of troops and transports. Night bombing squadrons bombed Deynee railway junctions, Thielt, Lichterfelde, Nielle, and Deynze. Every effort was made to obstruct the retreating Germans. To assist, fields were set up at Ingleverte, Oye, and Campagne.

*October 1.* Non-rigid, flown by United States Navy personnel based at Paimboeuf, engaged in peculiar fight with German submarines. Submarine fired 13 shots at the airship but neither was able to inflict damage on the other.

Naval Air Station at Killinghome used H-16's for operations against North German Coast. At first H-16's had very poor radiators and propellers, but by October reasonably good performance could be expected from these craft.

Number of trained pigeons on hand for seaplane use, 986. Number under training, 535. Total with U.S. naval aviation forces, 1521.

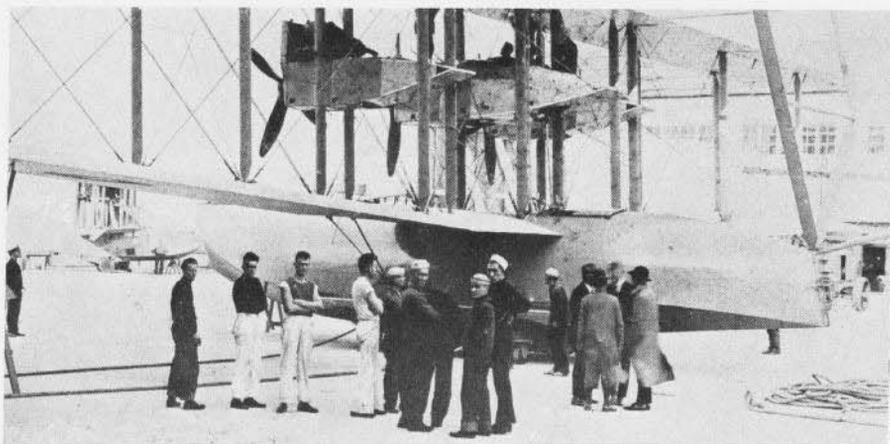
*October 2.*—Capt. Francis Patrick Mulcahy, U.S.M.C., was awarded Distinguished Service Medal for supplying isolated French troops with

food in face of intense fire from rifle, machine gun, and artillery.

*October 4.*—The first NC-1 flying boat was successfully flown. This was approximately one year from the commencement of the design. New propellers and high compression

*October 13.*—No. 7 squadron Night Bombing Group destroyed two enemy aircraft attacking their formation.

*October 15.*—Shortage of seaplane pilots at anti-submarine patrol stations. Allowance 396—on hand 158. Borrowed 32 from Northern Bomb-



CURTISS NC-1 FLYING BOAT ON FIRST SUCCESSFUL TEST HOP EXCEEDED DESIGNED LIFT LIMIT

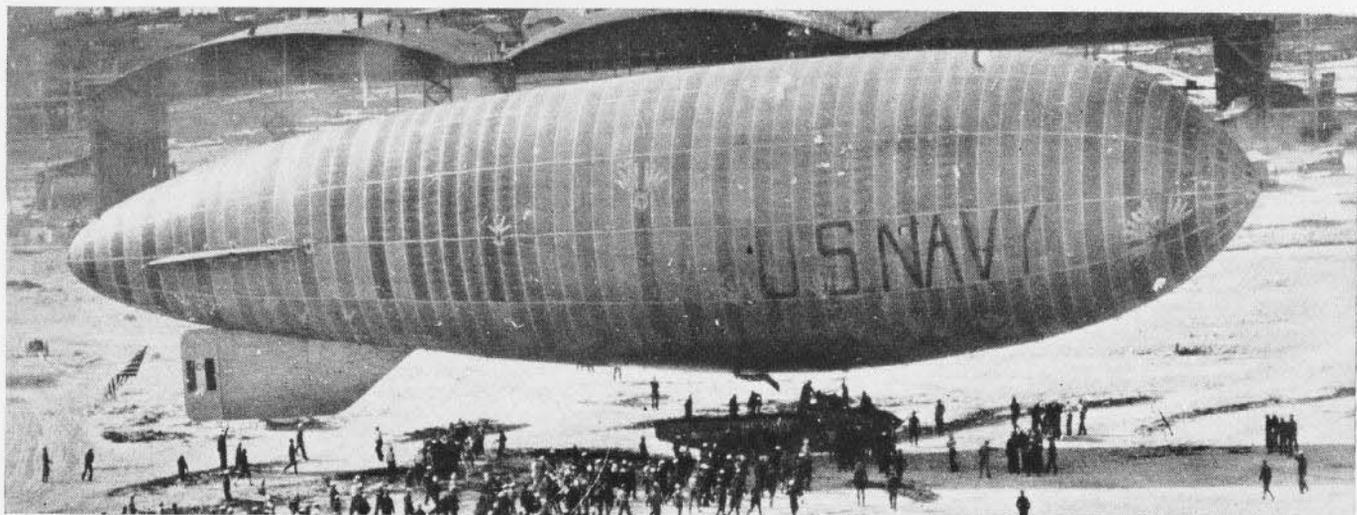
Liberty engines enabled the craft to take off with a total weight of 24,700 lbs.—thus exceeding the design load by 2,700 lbs. The month of November was devoted to intensive tests of this plane.

*October 5.*—Marine squadron "D" of the Day Wing Northern Bombing Group, consisting of 42 officers and 198 enlisted men, arrived at Le Franc aerodrome completing the four squadrons of the Day Wing.

ing Group which were not yet equipped with sufficient planes.

*October 16.*—Up to this time Pauillac had received from the United States 96 planes, 82 engines, 207 props. Brest had received 40 planes, 40 engines, and 253 props.

*October 20.*—Total number of Liberty engines received in French ports to date was 842. Of these 105 had been shipped away, mostly to Eastleigh, but some were sent to Italy.



NON-RIGID AIRSHIP C-1 DEVELOPING SPEEDS UP TO 60 MPH FROM TWIN 150 HORSEPOWER ENGINES IS TEST FLOWN FROM AKRON TO ROCKAWAY, L. I.

**BANTER**



# Is the PBY Human?

**A**N ARGUMENT as to whether the PBY will enter heaven when it dies, just as do all naval officers, has reached the stages of furious debate at Quonset's Air Combat Information Officers' School. Nobody ever gave the subject a thought until a local cameraman with a strong metaphysical bent began to notice changes in facial expression as the flying boat completed various stages of flight.

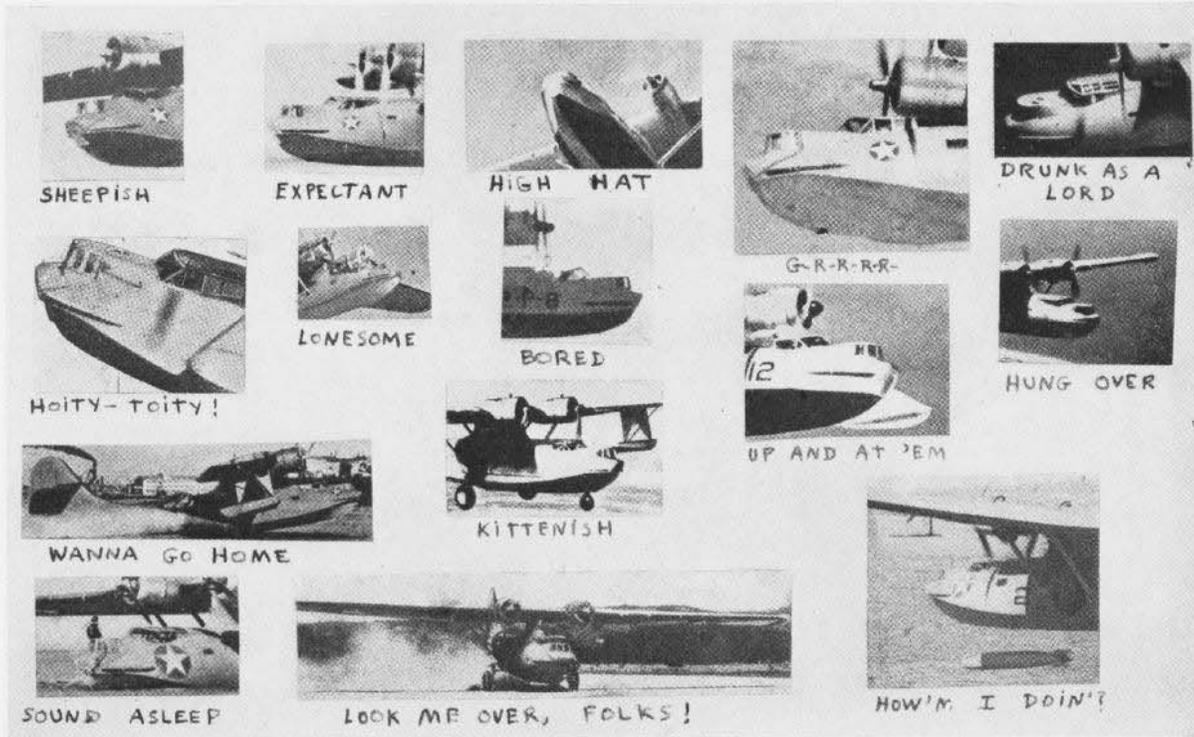
The more he watched the more he became confirmed in his suspicion that the PBY somehow had transcended the bounds of mere matériel and transmigrated into a state of humanity. That

night he was so excited he could only sleep 8 hours.

Armed with a reliable camera, he set about to spy on the itinerant plane and prove his point. Most of the shots were taken from vantage points when the PBY wasn't looking and was freely exercising its innermost feelings without any traces of self-consciousness.

Scenes on this page were submitted to Naval Aviation NEWS as evidence of the PBY's humanity. In the absence of a rebuttal from the negative, no conclusion can be handed down, but it seems safe to observe that, at the very least, the PBY is an emotional critter . . . a plane of many moods.

**EXERCISING MANY MOODS THE PBY RUNS GAMUT OF EMOTIONS IN THESE CANDID SHOTS TO BECOME BEST PHOTOGRAPHIC MODEL**



# HOW TO DO WITHOUT

## Keep Alive During Escape—Marine Corps Captain Counsels



MARINE CORPS

NATC, CORPUS CHRISTI—*Words of advice on getting along with the enemy are offered by a Marine Corps Captain whose most memorable experience in the combat zone took place during the week he spent in enemy territory on famous Guadalcanal island.*

*The Captain, a former naval aviation cadet, insists that "no matter how often you come to a water supply always stop and drink your fill, for you never know how long it will be until you'll get another drink. Heavy dew in the early morning will serve if you lick it from the foliage. Water is one essential in the tropics; without it you can't last much longer than two and a half days.*

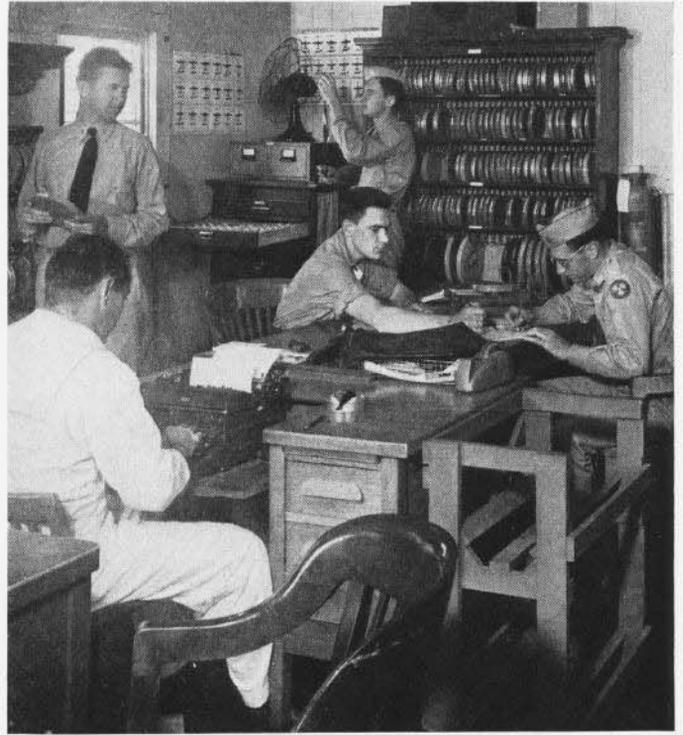
"SINCE real hunger knows no limitations, you'll find that ants, snails, and young roots can ease an aching stomach. Coconuts, when available, are your best source of food. The milk will serve as both food and drink.

"If you know you have a long trip ahead of you, never travel during the noon hour or early afternoon. The heat of the sun will dehydrate you and leave you weak just about three times as quickly as it will in the early morning or late afternoon.

"Always take the most difficult route. By this I mean that, should there be enemy troops on the move in your vicinity, it stands to reason they will be moving along the easy trails. It will take longer to get where you're going this way, but who cares how long it takes, just as long as you get back!

"I believe here lies the real reason I was able to travel through over 5,000 Japanese troops. Never grow so despondent that you throw caution to the wind.

"Kill only if it is a case of self-preservation. Never kill just because the opportunity presents itself. Even though the victim appears to be alone, the sound of your gun or scuffle, no matter how short, is bound to bring an investigator. If you are forced to kill, and if at all possible, place the body back in the jungle where it can't be readily found, for a dead man will warn the enemy of your presence in that general area."



ESTABLISHED LESS THAN TWO YEARS AGO, NORFOLK'S FILM LIBRARY HAS DISTRIBUTED MORE THAN 150,000 PRINTS TO ACTIVITIES WITHIN THE AREA

# NORFOLK'S MODEL FILM LIBRARY

## This Set-Up Suggests Procedure on Film Distribution and Maintenance

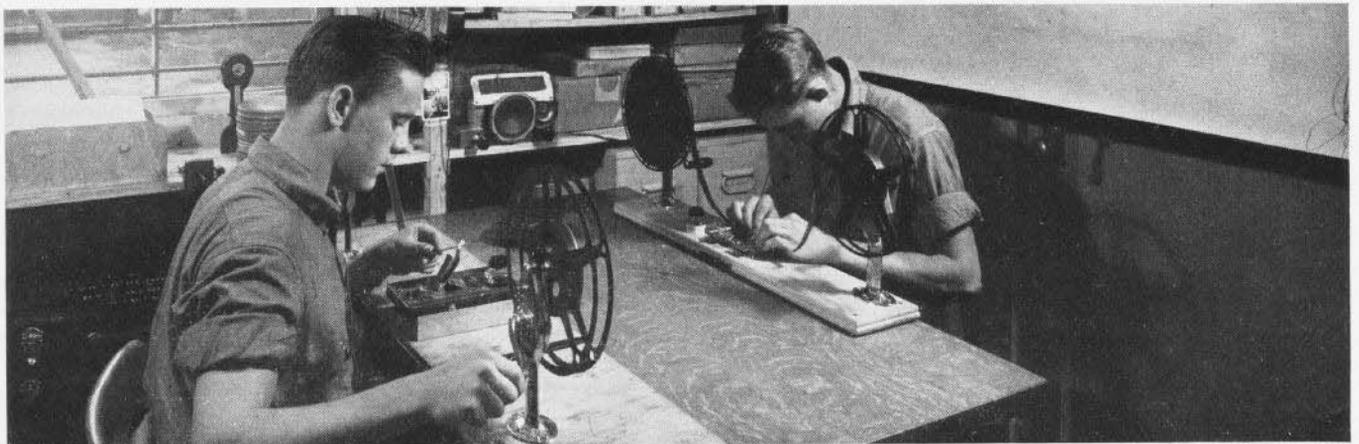
SINCE the Training Film Library at NAS Norfolk, Virginia, was started nearly two years ago, it has distributed over 150,000 prints of films to activities in the Norfolk area. Established in an old remodeled building, the library was first started to provide films for various stations and groups and has since become a center for both film distribution and repair and maintenance.

It is divided into three rooms. The largest of these contains racks and cabinets which hold the films, it being the room where general administrative work is done. One of the smaller rooms is a maintenance and repair shop, where films are repaired and equipment stored. The other is used for checking and editing film.

The Norfolk library furnishes films and information to air groups, Fleet Air Wing, CASU, HEDRON, and to schools in the area. In addition, it schedules and routes general interest

films, such as *The War*, on a regular weekly circuit to outlying activities. General instructional films such as *Forced Down at Sea* and *History of Naval Aviation*, entertainment films for areas where public entertainment is scarce, and new training films for officers in BOQ are also available. The library cooperates closely with Army units.

Another important function of the Norfolk unit is maintenance of equipment for all activities. Some units are small and their need for equipment proves merely occasional.



CHECKING AND SPLICING FILM, REPAIRING PROJECTORS, AND GENERAL MAINTENANCE OF EQUIPMENT ARE AMONG MANY JOBS BUSY LIBRARY PERFORMS

NAVY PIER



## “TIN BEATERS” ARE TECHNICIANS

THE AVIATION metalsmith may be just a “tin beater” to some people, but he learns early in his training that life is much more than a succession of thumps or bumps on metal. At naval air technical training centers such as Navy Pier, Chicago, he gets the instruction necessary to make him a thorough technician in airplane structural work.



**DRAFTING**



**HAND TOOLS**



**PLASTIC REPAIR**



**RUBBER TANKS**



**METAL PATCHING**



**WELDING**



**FORGING**



**ELECTRO-PLATING**



**PLANE REPAIRS**

First of all, the prospective AM gets a firm foundation in aircraft blueprint reading, sketching, drawing and mathematics. Then practice is given in correct use of hand tools. In what is called the sheetmetal phase, he is taught various types of airplane repairs, working on floats, fuselages, cowlings, skins, plastic cockpit enclosures, etc.

He acquires a general knowledge of welding fundamentals. He works on cast iron, sheet and tube steel and sheet and cast aluminum, followed by forge work, metal spraying, anodizing, electroplating and furnace heat-treating, closing with emergency repairs to all the types of aircraft under actual squadron operating conditions.

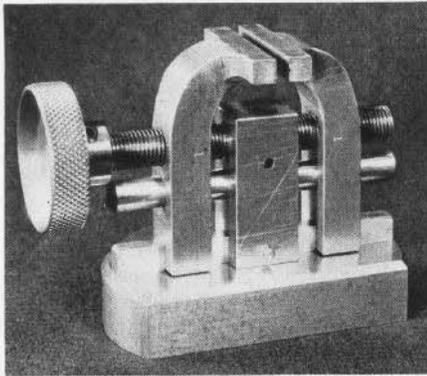
# TECHNICALLY SPEAKING

## Instrument Maker's Vice

### Versatile for All Shop Work

NAS, ALAMEDA. — An instrument maker's vice has been developed here through experiments with ordinary hand vises mounted on bases.

This labor saving device may be used as a drill vise, by turning it on its side, to hold electrical instrument movements. (Extra care must be taken in tightening so that delicate wires are not injured.) It also may be used as a general utility vise for holding small instrument parts.



MANY ARE SHOP USES FOR INSTRUMENT VISE

If machine shop facilities are not available for construction of this unit, a standard hand vise may be filed or ground on one side to indicated size and shape, then mounted on a base. However, this will not be found as satisfactory, owing to excessive side play in the jaws.

[DEVELOPED BY C. S. BOONE, H. G. JOHNSON, AND J. L. PLUMB]

## Variable Speed Tachometer

### Unit Has Simple Design

NAS, GROSSE ILE.—A variable speed tachometer testing unit was designed at this station and built in the machine shop of the Aircraft Maintenance Department. This unit consists of a 1/4 horse electric motor, a variable speed drive, a master tachometer; and a power take-off for testing either mechanical or electrical tachometers. The variable speed drive consists of two metal discs, a fiber wheel, and a cross feed mechanism.

One of the discs is driven at constant speed by the electrical motor and variable speed is obtained on the other disc by feeding the fiber wheel in and out across the discs.

It is possible with this arrangement to obtain speeds from 50 RPM to about 6,000 RPM. The unit is of very simple design, is easy and economical to manufacture, and maintenance is practically negligible.

[DESIGNED BY A. F. LEWIS, AMM3C AND R. F. DILLEY, AMM2C.]

## Are Your Clamps Tight?

### Safety Wiring Is Deceptive

MCAB, KEARNEY MESA. — Inexperienced mechanics, even though trained to check tightness of hose clamps, tend to accept safety wiring as evidence that clamps are tight.

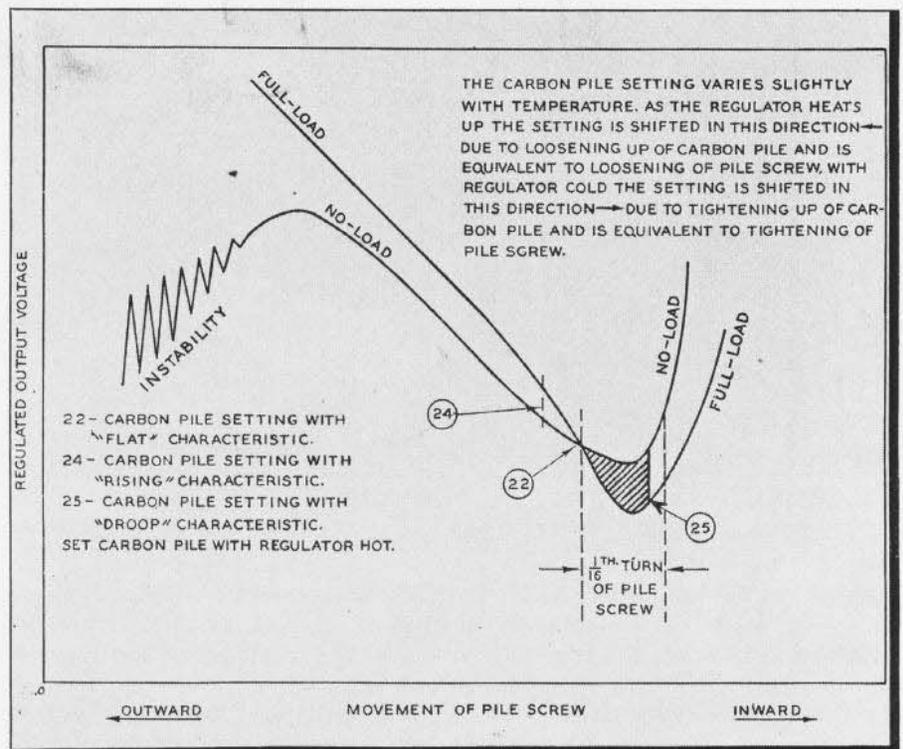
It is believed that if safety wire were left off all nacelle hose clamps, as is Army practice, mechanics would check for tightness more often, as well as with less trouble. Six to eight hours

## Adjusting Voltage Regulator Recommended for Carbon Pile

Several instances of poor regulation, "jitter" or "double trace," instability, and excessive wear of carbon pile regulators have been reported in recent months. Most of these problems can be overcome by proper adjustment of the voltage regulator. Technical Note 3-43 was prepared to provide information on the proper method of adjustment. It also includes useful information on the operation, theory, and mechanical construction of these regulators. It is

recommended that this Technical Note be carefully read and studied.

The last sentence of paragraph 16 (c) I (b) of the TN points out the approximately correct adjustment. With such an adjustment, a drop in voltage up to 5% may result as load is applied. This lowered voltage or "droop" provides a more stable regulating point and a longer period of operation of the carbon pile before the pile screw needs to be screwed in to take up for pile wear experienced.



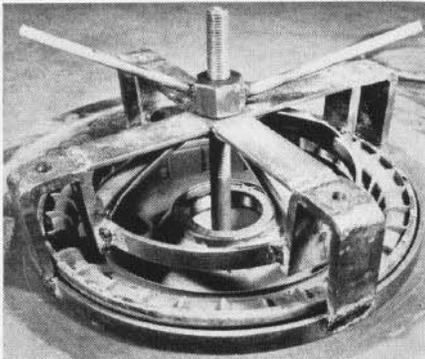
are required for one man to safety-wire one engine completely, so there should also be considerable saving in time.

► **BuAER COMMENT**—BuAer letter Aer-E-2514-IHB, F27-2(2), 74676 of 18 May, calls attention to the fact that safety wire on hose clamps is not required or desired. Standard AN-746 clamps now being produced do not incorporate hole for safety wire in thumbscrew.

## Tire Puller Eases Change Stations Will Get Removal Tools

CASU 2, PACIFIC.—Because of great difficulty experienced in removing tires from TBF-1's and F4U-1's, this unit has designed and constructed a tire puller to aid in the operation.

In many instances the rim sticks to the tire with such force that a press of some type is needed to separate the two. Frequently in the past it has taken two men as long



PRESSURE ON OUTER RIM BREAKS TIRE LOOSE

as two hours to change a tire by hand. Now one man using the puller can do the job in 30 minutes. The device is small enough to be carried and used at the plane.

Tires of TBF-1's wear on the outside half, and longer life is possible by reversing the rotation frequently. (See T.N. 67-42). Without the use of a puller or press, many casings are bruised and made unfit for further service. The puller is made of material available in any service unit and can be manufactured by unit personnel. If made up in quantity for distribution to operating units, the use of Acme thread rather than N.C. is recommended.

[DEVELOPED BY MACHINIST S. L. NICHOLS, USN]

▲ **BuAer COMMENT**—P.D. 8249-44 (Contract N88s-15916) ordered 1,000 sets of Firestone Tire Removing Tools. A set has been added to the BTCA per letter Aer-Ma-2242-VW, F29-1, #111564 to ASO, NASD, dated 19 July 1943. Class A stations will get two sets and other stations one. The remaining sets will be equally divided between ASA Oakland and ASA Norfolk. The Firestone set seems less bulky than the CASU 2 tool.

If drawings and specifications of the CASU 2 tool are wanted, it is suggested that the activity correspond with CASU 2 and not with BuAer.

## PBY Plywood Platforms

### Permit Closer Parking of Hulls

NAS, PENSACOLA.—Replacing bulky floor type work-stands at NATC, Pensacola, are platforms made of

lightweight plywood and supported by wing strut fittings on the hull of a PBY seaplane.

These new platforms provide a two by fourteen foot working area along both sides of the tower. They are supported by the hull, thus eliminating necessity of moving floor stands when hulls are shifted to another location. (Continued next page)

(Succeeds list of August 10, 1943)

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

September 20, 1943

Engine	Bulletin	Date	Engine	Bulletin	Date
<b>Pratt &amp; Whitney</b>			<b>Continental</b>		
R-1830	329	8-26-43	R-670	11	7-30-43
R-1830	330	8-28-43	<b>Ranger</b>		
R-2000	34	7-16-43	V-770	15	Supp. No. 1 8-18-43
R-2000	35	7-14-43	V-770	18	8-20-43
R-2000	36	7-29-43	<b>General Engine Bulletin</b>		
R-2000	37	8-26-43	<b>Date</b>		
R-2000	38	8-4-43	6		8-13-43
R-2000	39	Being issued	7		Being issued
R-2000	40	8-28-43	8		Being issued
R-2000	41	Being issued	9		8-2-43
R-2000	42	Being issued	10		8-17-43
R-2000	43	8-31-43	11		Being issued
R-2800	79	Being issued	12		8-23-43
R-2800	80	7-31-43	13		8-20-43
R-2800	81	8-26-43	<b>Auxiliary Power Plant Bulletin</b>		
R-2800	82	Being issued	<b>Date</b>		
R-2800	83	8-14-43	1		8-2-43
		Supp.	2		Being issued
		8-20-43	3		8-26-43
R-2800	84	Being issued	4		8-15-43
R-2800	85	8-10-43	<b>Propeller</b>		
R-2800	86	8-13-43	<b>Date</b>		
R-2800	87	8-15-43	<b>Curtiss</b>		
R-2800	88	8-21-43	1		8-30-43
R-2800	89	8-27-43	2		8-26-43
<b>Wright</b>			<b>Hamilton Standard</b>		
R-1820	334	7-8-43	1		8-11-43
R-1820	335	7-29-43	2		8-15-43
R-1820	336	8-4-43	3		8-17-43
R-1820	337	8-12-43	<b>General Propeller Bulletin</b>		
R-1820	338	7-30-43	<b>Date</b>		
R-1820	339	8-7-43	1		8-2-43
R-2600	97	7-8-43			
R-2600	98	8-30-43			
R-2600	99	8-12-43			
R-2600	100	8-2-43			
R-2600	101	7-30-43			
R-2600	102	8-6-43			
R-2600	103	8-7-43			
R-2600	104	8-26-43			
R-2600	105	8-21-43			
R-3350	18	Being issued			
R-3350	19	7-8-43			

It will be noted from the above list that engine changes are no longer being sent out. Instructions which would, on the basis of past practice, be issued as engine changes are now being issued as bulletins with the intent of simplifying the identification of instruction and information material issued by BuAer concerning engine operation and maintenance. It will further be noted under the date column that the latest supplements, revisions, or reissues are now shown. Supplements obviously must not replace basic bulletins in service files but should be attached to them. However, revisions do replace the previous issues and to avoid inadvertent reference to superseded instructions all such issues should be destroyed. Occasionally reissues are sent out. Reissues also replace the previous publications but differ from revisions in that only minor corrections are made.

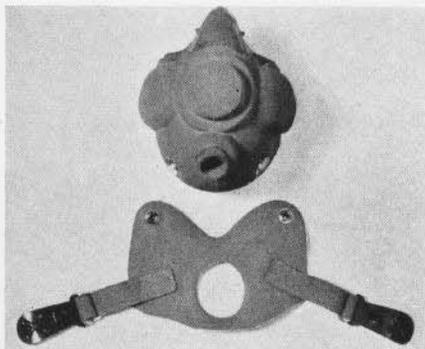
Note, also, that the above list now includes the latest issues of the recently established propeller and auxiliary power plant bulletin series.

[PBY...continued]

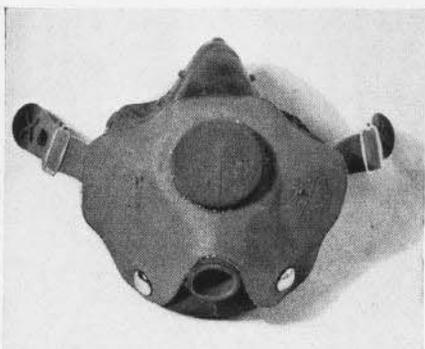
Use of these platforms also allows a closer parking of hulls in the over-haul and repair area. An eight outlet air manifold and eight electrical receptacles are mounted on the platform to provide power for tools. Drawings are available upon request at the Plant Section, A&R Department.

## Oxygen Mask Suspension

Fighting Squadron 32 has proposed a method of suspension for the type D, demand type oxygen mask which appears to be satisfactory for units using demand type



FABRIC SUPPORT IMPROVED OXYGEN MASK FIT



ELASTIC BANDS SIMPLIFY SIZE ADJUSTMENT

oxygen systems, who find the present method of suspending this mask inadequate.

This method utilizes a fabric support developed by the Naval Air Material Center to obtain a more satisfactory suspension and, in addition, employs quick disconnect fittings and elastic bands. The suspension illustrated has been found to provide a more comfortable mask fit and gives an adequate range of adjustment for the attaching straps. A treated fabric weighing approximately 12 oz. per square yard dyed, the same color as the mask, has been found satisfactory for this purpose.

Type A-14 oxygen masks incorporating a greatly improved method of

suspension are now under procurement and are being issued in quantity as they become available.

## Oleo Strut Gauge Is Useful Can Be Made from Scrap Metal

ADU, PORT COLUMBUS. — The Engineering Department here has developed an oleo strut gauge which



SIMPLICITY MAKES OLEO STRUT GAUGE USEFUL

has proved useful in checking the height of landing gears of the various airplanes serviced. Owing to the simplicity and usefulness of this gauge, it is believed that other activities may wish to copy it. Scrap metal may be used in its manufacture.

## Carrier Tire Inflation Pumps LP System Now Being Modified

Since tires of carrier type aircraft now require pressures of more than 100 lbs. p.s.i., the LP system aboard carriers does not have sufficient capacity to satisfy present tire needs. To remedy this situation, BuAer is arranging to have the carrier LP system modified to provide a working pressure of 200 lbs. p.s.i.

In the interim, Aerol High Pressure Hand Pumps and portable gasoline powered Par Compressors are being procured by BuAer. They can be obtained by carriers in commission on requisition to BuAer, and will be furnished to future ships as part of commissioning allowance. The next edition of BuAer Allowance List, Section "G", will provide one compressor for each carrier, six

(Succeeds list of August 15, 1943)

### LAST SERVICE AND OBSOLETE AIRPLANE BULLETINS AND CHANGES (CONTRACT CHANGES NOT INCLUDED)

September 15, 1943

Airplane	Bulletin	Date	Change	Date
BD-2	6	5-22-43	21	8-28-43
F4F-3	42	8-26-43	132	7-7-43
F4F-4	36	8-26-43	91	7-7-43
F4F-7	10	8-26-43	36	7-3-43
F6F-3	9	8-11-43	26	8-2-43
FM-1	17	8-26-43	35	7-7-43
F4U-1	18	8-2-43	67	8-17-43
J2F-5	13	8-17-43	14	5-4-43
N2S-3	16	7-21-43	24	8-9-43
N2S-4	9	8-20-43	5	8-9-43
N2S-5	1	7-9-43	2	8-6-43
OS2N-1	25	7-12-43	31	7-26-43
OS2U-3	50	7-12-43	61	7-26-43
PV-1	11	8-3-43	55	8-17-43
PV-3	4	1-20-43	10	8-26-43
PBM-3	29	8-25-43	84	8-9-43
PBM-3C	26	8-25-43	41	8-9-43
PBM-3R	21	8-25-43	79	8-9-43
PBM-3S	3	8-25-43	7	8-9-43
PBY-5	36	7-22-43	133	8-11-43
PB2Y-3	6	5-18-43	84	8-15-43
PB2Y-3R	5	7-2-43	74	8-15-43
PB4Y-1	20	7-16-43	42	8-18-43
R4D-1	11	7-12-43	14	8-6-43
R4D-3	7	7-12-43	11	8-21-43
R5D-1	1	5-26-43	32	8-13-43
SBD-3	69	7-13-43	135	7-28-43
SBD-4	21	7-21-43	39	7-28-43
SBD-5	13	8-12-43	18	8-14-43
SB2A-4	4	8-28-43	63	7-20-43
SB2C-1	12	8-28-43	6	5-4-43
SNB-1	8	8-26-43	14	7-3-43
SNB-2	8	8-26-43	8	5-24-43
SNJ-3	23	7-30-43	19	8-6-43
SNJ-4	18	7-30-43	16	7-26-43
SNV-1	8	10-24-42	33	8-9-43
SO3C-1	23	8-3-43	52	8-18-43
SO3C-2	15	8-3-43	36	8-18-43
SO3C-2C	4	7-23-43	4	8-18-43
TBF-1	70	8-21-43	135	8-13-43

pumps for CV's, and four pumps for CVL's and CVE's. Since quantity of pumps now available is small, it is suggested that carriers in commission limit their first requisitions to two.

## Self-Motivated Wheels

### Suggestion Lacks Practicality

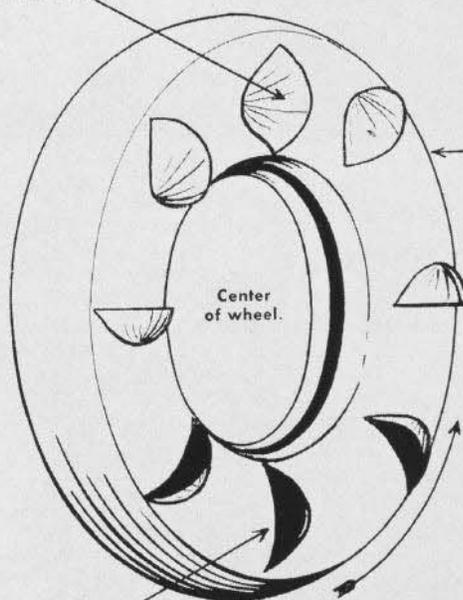
NAS, MELBOURNE. — A suggestion has been submitted by the station for self-motivated landing gear wheels for aircraft which start rotation of the wheel prior to contact with the runway, thus saving and prolonging life of the tire.

Vanes of rubber, molded as an integral part of inner sidewall of tire, would cause tire to rotate. This would be adaptable only to planes with retractable gear. Thus, when gear was retracted, vanes on inner sidewalls would be folded out of the airstream, i. e., between tire and air-plane. Then, when gear was let down for landing, these vanes on inner sidewalls would be exposed to the airstream, causing wheels to rotate in desired direction (accomplished by installing wheels so vanes would turn them just as vanes on a mill wheel or water wheel turn it).

Since airplane tires wear out chiefly from sudden contact of a motionless tire with runway, this means of getting them in motion would give almost the lifetime of an automobile tire.

Variations would undoubtedly have to be made, but the principle is just

Back end of cups which had caught air on opposite side of wheel, are streamlined, thus presenting no effective surface of resistance on this side which would counteract the turning of the wheel.



Tire on wheel of plane.

Airstream strikes cupped vane, causing tire and wheel to turn in this direction.

Since this is the direction tire will turn when it strikes the runway, the rubber which would normally be worn or burned off would be saved. Cupped vane bulges out. Front end open, rear end closed, and faired if desirable.

Since speed is no longer needed when the airplane is approaching for a landing, the added drag of the cups is no disadvantage.



INNER WALL OF TIRE

as sound and practical as that of a mill wheel or grain hoist—in this case being applied to reverse.

► **BuAER COMMENT**—The suggestion that landing gear wheels be motivated or pre-rotated prior to contact with runway has been submitted to the Bureau many times, and various methods of accomplishing the necessary motivation have been proposed by wind-vanes or cups, as well as mechanical means.

The suggestion that cups or vanes be attached to the main landing wheel tires is submitted frequently for consideration.

Investigation has revealed that basically it is doubtful whether any pre-rotational device would provide a satisfactorily remedial effect on tire wear. To substantiate this belief, an analysis of the wear experienced with aircraft tires must be made. It will be noticed that normally the main landing wheel tires of an airplane wear, for the most part, along the outer edge of the tread, or in the shoulder area of the tire. This is especially true with the low pressure and smooth contour type tires which are operated in a highly deflected condition.

It has been found that such wear is caused by brake action. The center of the tread, or the crown, is the area worn by scuffing when the wheel starts rolling due to contact with the ground. The heavier the airplane and the faster

its landing speed, the more noticeable is the wear on the shoulder of the tire, due to increased brake action. Auxiliary wheels, where no brake action occurs, generally wear uniformly.

Thus, it is readily observed that the wear due to scuffing at the initial contact is not the governing factor in determining tire life, but rather the more rapid shoulder wear which is caused by brake action.

After consideration that tests of the various methods of pre-rotating wheels have revealed that any method which will turn the wheels at velocities approaching the landing speed of the airplane would of necessity add considerable weight and create additional space and maintenance requirements; and in view of the fact that it is doubtful whether pre-rotation would provide a remedial effect on tire wear, the Bureau does not consider use of pre-rotational devices practicable at this time for use on military aircraft.

### ANSWERS TO DEAD RECKONING AND CELESTIAL NAVIGATION PROBLEM

1. Magnetic heading 316°
2. Calibrated air speed 109 k
3. Predicted ground speed 125 k
4. Estimated time of arrival GCT 1551
5. GCT 1500 DR position Lat. 27°-39' S  
Long. 112°-49' E
6. GCT 1500 FIX Lat. 27°-46' S  
Long. 112°-33' E
7. Wind Force 36 k  
Direction 067°
8. Magnetic heading to destination 336°
9. Revised ETA GCT 1547
10. Magnetic heading 169°
11. Course 110°
12. ETA 1917
13. GCT 1830 DR position Lat. 28°-25' S  
Long. 113°-39' E  
Lat. 28°-22' S  
Long. 113°-34' E
14. Fix
15. Revised ETA GCT 1924

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

(See page 7)



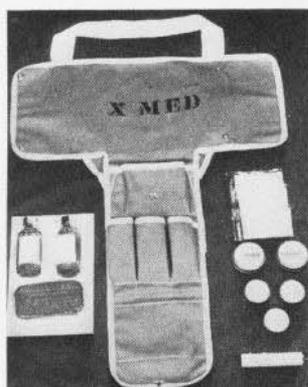
CALLING SQUADRONS

Do Your Pilots Wear  
PROPER GEAR

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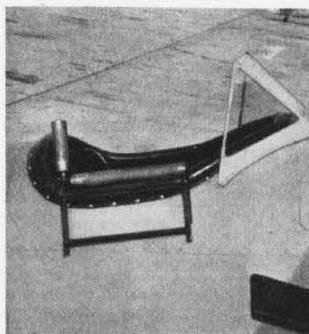
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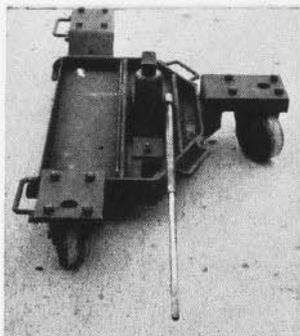
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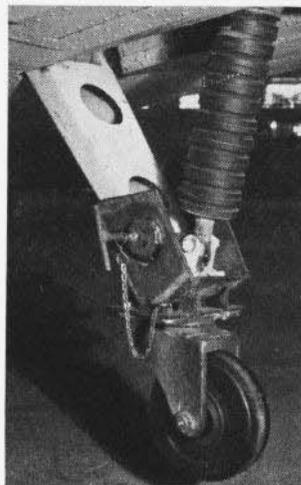
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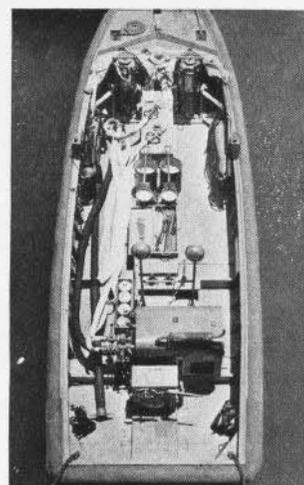
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**DOLLY SOLVES PB4Y-1'S PROBLEM**



**CRAFT SERVES THREE PURPOSES**

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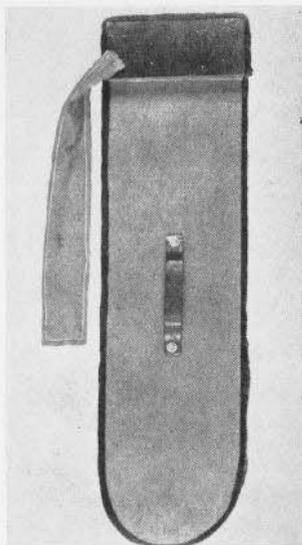
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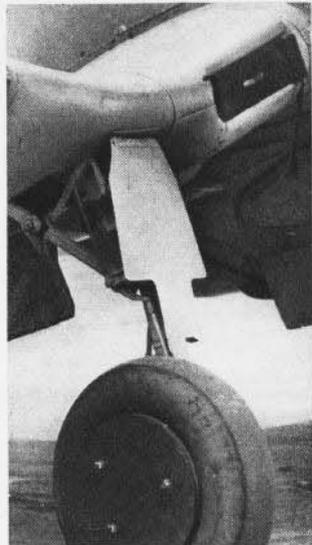
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SEALS AIR INTAKE OPENING



WOODEN PLATE SHUTS OUT SAND

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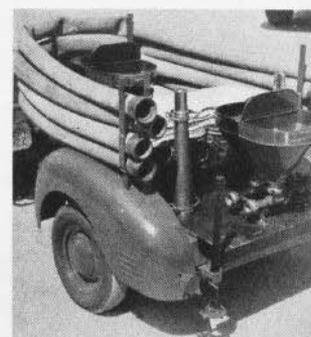
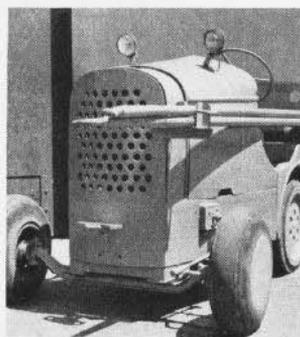
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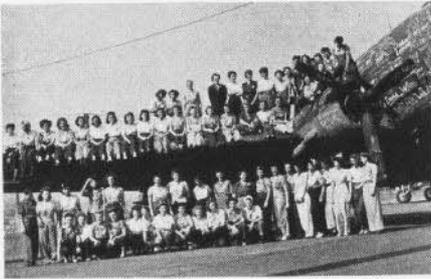
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# LETTERS

SIRS:

The accompanying photo shows the 2,000th cargo transport built at the Douglas Long Beach plant for Army and Navy use. It is of particular interest because it shows a remarkably fine group of women who are doing their part in an able and enthusiastic way to win the war.



It is also of particular interest in that about two years ago BuAer asked all firms in this area what their plans were as to the employment of women. Their replies at that time, with the exception of one or two companies, were that they planned to use them only to a limited degree. Since that time the war has brought new problems as regards the acquisition and training of personnel and the enclosed photograph shows the results.

COMDR., USN (RET.)  
INA, Douglas Aircraft Co.  
Santa Monica, Calif.

SIRS:

I am writing to you in the hope that you will be able to clear up for me a matter that no one on this station seems to know much about.

I am a reserve Naval aviator and would like nothing better than to become a member of the regular Navy. I can't seem to get any information on how, when, and where to submit an application.

LT. (JG) USNR

¶ Application for appointment of officers of the Naval Reserve to the line of the regular Navy should be submitted to the Bureau of Naval Personnel only when the service is requested to do so. Eligibility for appointment is limited to physically qualified officers of the Reserve meeting the requirements described in *a.* or *b.*:

*a.* Naval Reserve aviators who were less than 25 years of age upon

**BEST ANSWERS**  
to questions on page 8  
1.e 2.c 3.a 4.c 5.e 6.b

successful completion of training as aviation cadets, and who have prospects of completing on June 30 of the year in which they are appointed to the regular Navy not less than 18 months continuous active service next following completion of duty as aviation cadets.

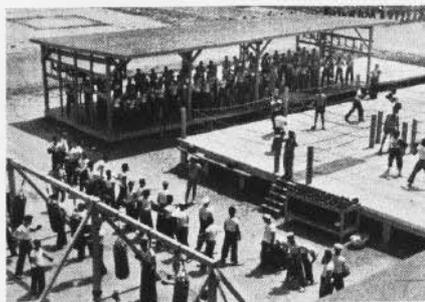
*b.* Officers commissioned in the Naval Reserve on graduation from NROTC who were less than 25 years of age upon reporting for continuous active duty on board Navy ships, and who have completed not less than one year of such duty.

BuPers will not make replies to applications from officers of the Naval Reserve who are not eligible for appointment. (See BuPers Circular Letter 127-43.)

SIRS:

Boxing is one form of physical exercise at this center that helps develop two-fisted fitness in enlisted men training for duty with the Fleet. The accompanying picture gives an idea of equipment set up outdoors for this practice.

NAVAL AIR TECHNICAL TRAINING CENTER  
Memphis



SIRS:

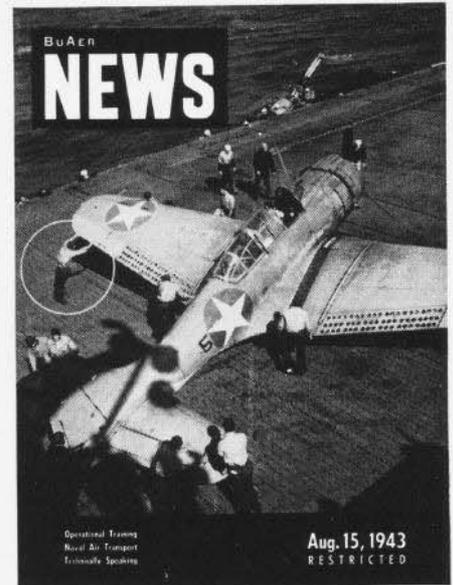
Our 200 copies of Naval Aviation NEWS are distributed to department heads. In addition, each company officer receives several copies for the use of men in his company. Other copies are placed in the magazine racks of the library; back numbers are catalogued and filed. We find that the librarian had been a little doubtful about making the publication too openly available to the men since each issue is marked "Restricted." That's an angle that may tend to limit circulation unduly elsewhere.

LIEUT., USNR  
Naval Air Technical Training Center  
Navy Pier, Chicago

¶ Naval Aviation NEWS should be made available to *all* men holding aviation rates, as well as to officers. The fact that it is Restricted, not Confidential, makes this possible.

SIRS:

Knowing what a stickler Grampaw Pettibone is for the right way of doing things, I was surprised to see Naval Aviation NEWS pull one itself.



On the cover plate of the August 15 issue is a picture of an SBD being pushed up the deck. Right there on the hinder side of the left wing is a guy pushing away at about a 45° angle on the trailing edge of the aileron. He isn't satisfied with only that but with one hand he is giving same treatment to the fletner.

I have combated just this same thing on numerous carriers and right now I am assisting in my small way in the making of a training film to show these lads the right way of doing things on the flight deck. And what happens? Why some bird I am laying down the law to in my own quiet way after removing him from the aileron, et cetera, says "Look!", and shows Naval Aviation NEWS to me.

The prosecution rests.

LIEUT. COMDR., USN  
Fleet Air, West Coast  
NAS, San Diego

P.S.—It is suggested that reference be made to the Book of St. Matthew, Chapter 7, Verse 3.\*

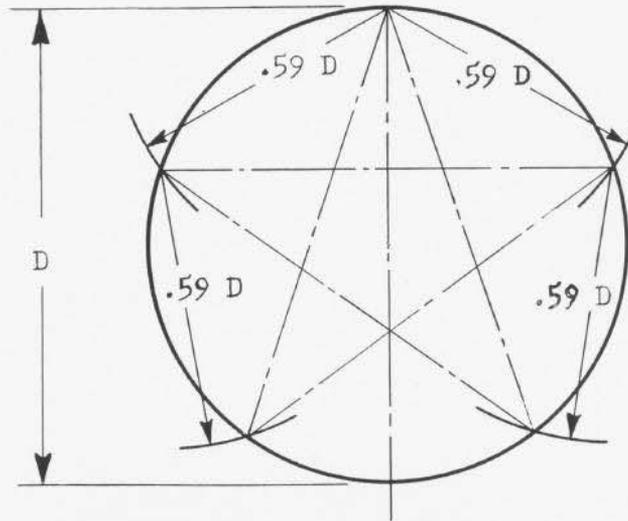
¶ Naval Aviation NEWS pleads guilty and Grampaw Pettibone enters a plea for clemency.

\* "And why beholdest thou the mote that is in thy brother's eye, but considerest not the beam that is in thine own eye?"—Ed.

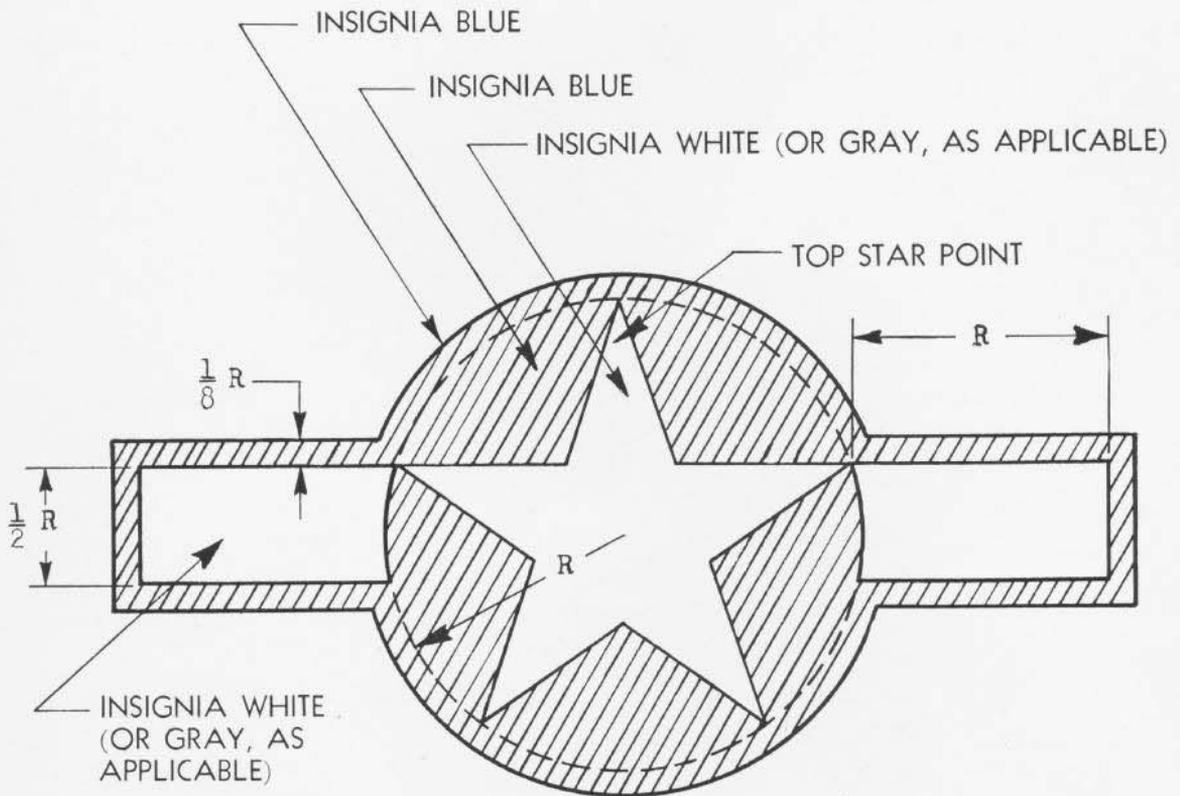


# DIAGRAM OF NEW INSIGNIA

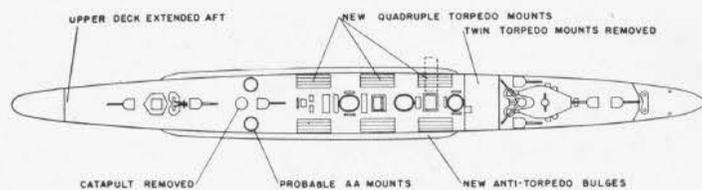
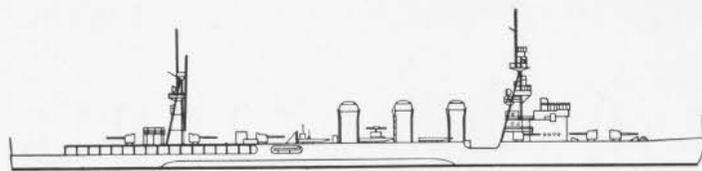
Army-Navy Aeronautical Specification AN-I-9b dated Aug. 14, 1943



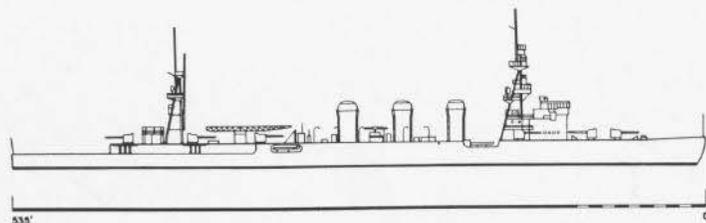
Suggested Construction for Templates or Stencils



*In the interest of accuracy, NAVAL AVIATION NEWS publishes this diagram of the changed national aircraft insignia. It differs from the reproduction in color appearing in the Oct. 1 issue in that white bars slightly extend into blue fields, as shown above.*



REFITTED  
AS OF JUNE 1943



AS OF OCT. 1942

COMPARISON OF KUMA CLASS CL  
BEFORE AND AFTER REFITTING

PREPARED BY P. I. U. ANACOSTIA D.C. SEPT 1943

## KUMA CLASS CRUISER REFITTED

Photos taken Makassar Harbor—Celebes June 23, 1943

These photographs taken at Juliana Quay during bombing attack show three *Kuma* class CL and one *Natori* class CL. Interpretation showed that two of the *Kuma* CL's were extensively refitted. Changes observed are:

Addition of 6 quadruple mount 21" torpedo tubes on upper deck. Twin torpedo mounts formerly located between foremast and number 1 stack have been removed. Old dual torpedo mounts amidships probably have been removed. (Due to angle of photographs it was not possible definitely to ascertain.)

Five-ft.-wide antitorpedo blisters amidships have been added, giving a visible beam of 57 ft.

Upper deck has been extended aft to within 40 ft. of stern.

Catapult has been removed.

Two AA gun mounts on port and starboard side in space cleared by removal of catapult. These probably are mounts for dual purpose twin mount 5" guns.

The six new quadruple torpedo mounts on cruiser are all swung outboard as *Kuma* gets underway during attack. This has been observed in other pictures and probably is done so that torpedos may be jettisoned rapidly in case of a bomb hit.

Ground information has been obtained to the effect that the enemy is now mounting some dual purpose twin mount 5" guns on this type ship. It is quite probable that the new AA mounts are for this type gun.



Note: Further study of deck guns and other possible changes was precluded by canvas awnings extending over various parts of deck