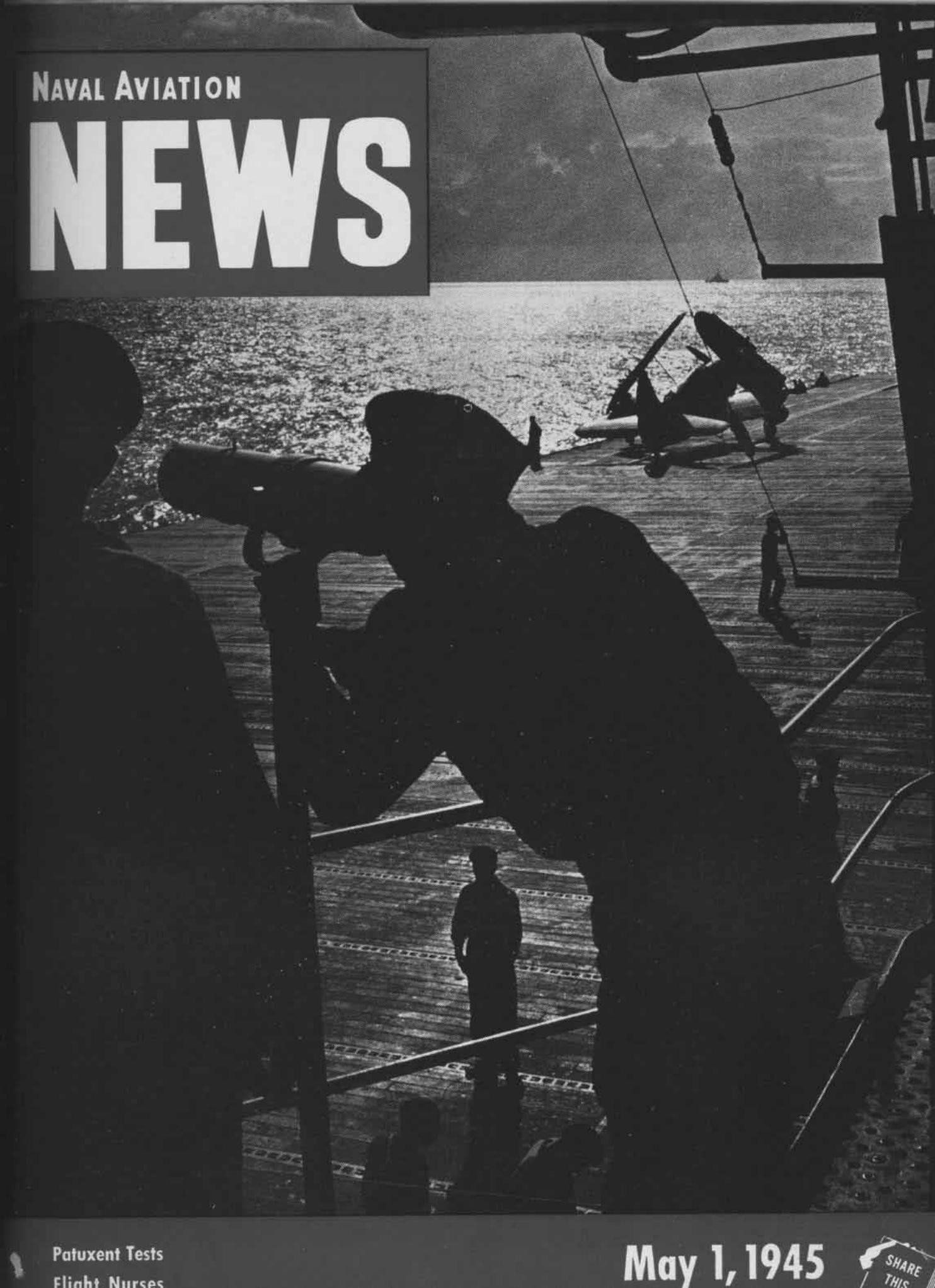


NAVAL AVIATION

# NEWS

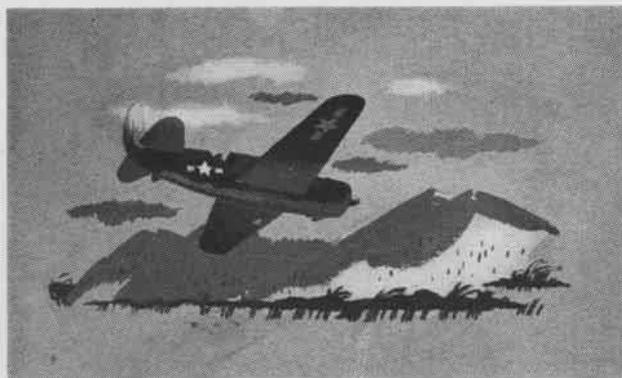
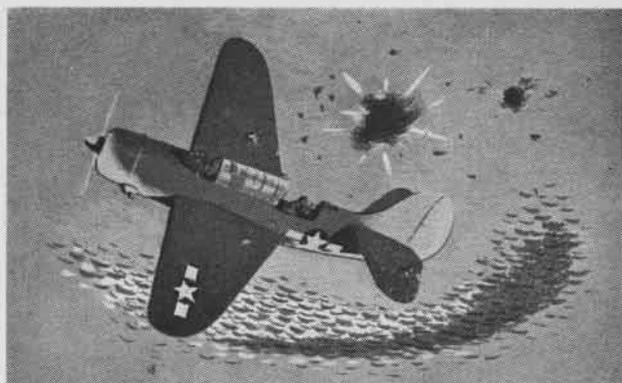


Patuxent Tests  
Flight Nurses

May 1, 1945



# STANDBY THE RAFT



**"Bombs Away"** . . . and the SB2C pulled out of its dive. One sure hit was exchanged for a flak-riddled Helldiver.

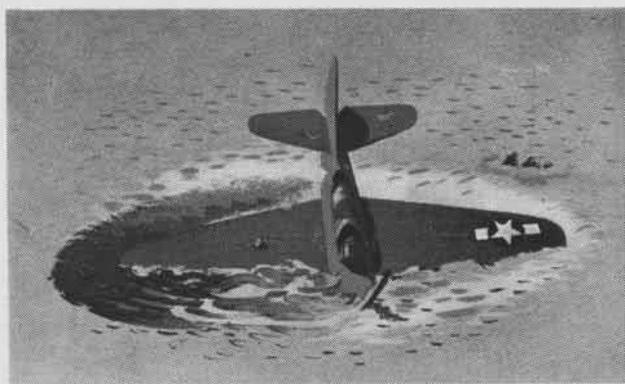
Walter D. Frierson, radioman, called his pilot. "We got it in the starboard wing." There was no answer, but the plane pulled out of the formation and headed toward the sea.

A range of mountains, 8000 feet high, loomed up in front of them. The plane side-slipped, recovered, then

slipped again. Making a desperate effort to lift the SB2C, the pilot barely skimmed her over the top.

For the first time, he came on the radio: "We're leaving the plane. . . . Standby the raft," and they swooped down for a perfect water landing. Slowing to a halt, the pilot called again. . . . "Hurry up—I'm hurt." This was the first indication Frierson had that his pilot was wounded.

Jumping out on the wing, the aircrewman helped his

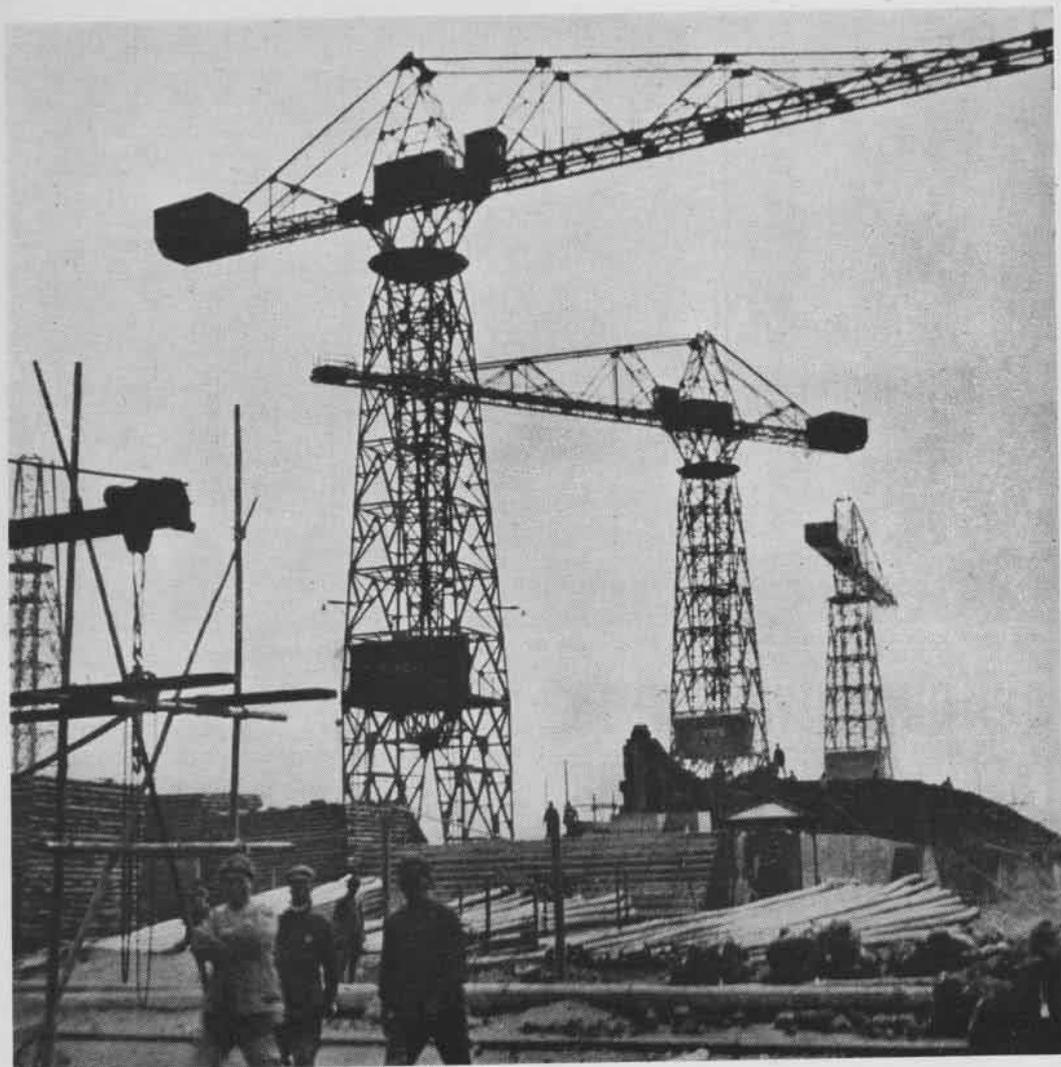


pilot out of the cockpit, and fumbled with his life belt. It failed to inflate. Frierson snatched off his own and pushed the man's arm through it to keep him afloat. Then breaking out the raft, he pulled his wounded pilot aboard.

A 40 mm. Jap shell had exploded in the cockpit, and struck the pilot in the thigh. Frierson applied first aid and bandaged the shattered leg. A short time later, an OS2U landed on the water—and they were rescue bound.

**AIRCREW MEN HAVE WHAT IT TAKES**

No. 23 of a series



## JAPANESE SHIPYARDS

SHIPPING is a critical factor in Japan's war program. An island empire, Japan needs hundreds of ships to import food and raw materials and to supply far-flung garrisons. American subs, planes and warships have whittled great chips off the Jap merchant fleet, and the enemy's shipyards have been unable to provide replacements fast enough. Because of the need for haste in keeping tonnage available, repair probably has become the most important part of the enemy's shipping program, and drydocks and other repair machinery are in constant use.

The majority of Japanese shipbuilding facilities are located in Southwestern Japan. Steel ship construction has been concentrated in a few "Standard" designs,

### PHOTOGRAPHIC INTELLIGENCE

which appear to sacrifice speed for more cargo space and quickness of building. Many of these vessels are constructed with easily recognized angular lines and flat plate surfaces, in order to speed production. The Japs have not widely adopted welding in ship construction, as U.S. yards have, and they have not greatly expanded existing shipyards or developed many new ones. Some development of "mass production" methods has been seen on aerial photos. The enemy carries on a wooden ship construction program of undetermined extent, but it is believed to be turning out mostly small vessels. On the whole photographic intelligence reveals that Jap shipyards and repair facilities are proving too slow and inadequate.



OLD PICTURE SHOWS BUILDING WAYS AND CRANES IN SHIPYARD AT NAGASAKI. HILLS IN BACKGROUND MAKE EXPANSION DIFFICULT

## JAP SHIPBUILDING DIVIDES INTO SEVEN STAGES; LITTLE WELDING

SHIPBUILDING divides into seven essential processes. The first operation, design and layout, involves laying down of the ship's lines at full size and making templates or molds of every structural part of the ship. When templates are completed, they are furnished to the fabrication shop together with steel plates and shapes that have been stored previously. Here the various steel members are cut, shaped, drilled and punched to the exact duplicate of the templates. Fabricated material then proceeds by crane to storage spaces or to areas where the third operation, assembly of units, takes place. This may be performed under

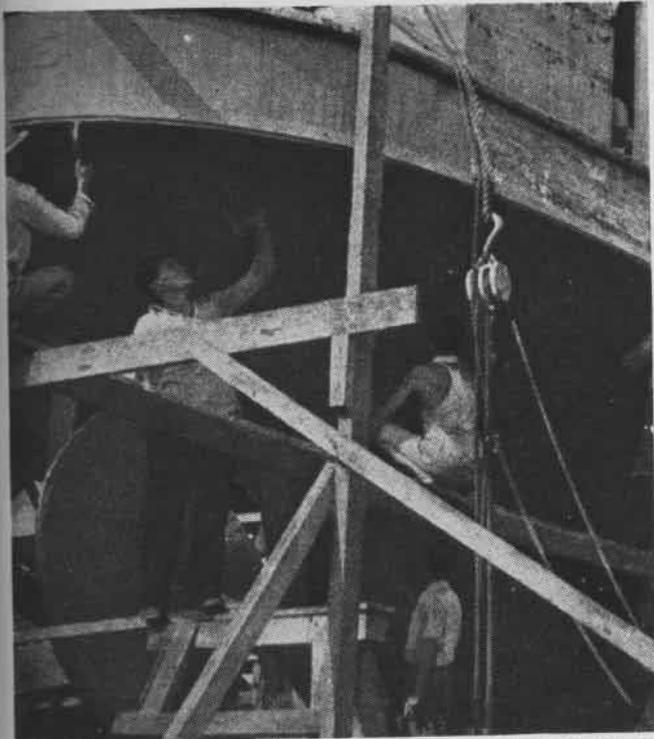
the same roof as fabrication, or it may be done in the open on assembly slabs. This stage involves putting together units such as bulkheads, frames, sterns and bow assemblies.

The fourth stage, known as hull erection, consists of taking to the building ways, hoisting up and fitting together structural and assembled members. When erection is completed, the ship is launched and then brought to a wet dock for fitting out. The final stage consists of shipping all machinery (if this was not done prior to launching), installing armament and completing all work necessary to make the ship ready for sea.

Operations one through six are devoted essentially to structural work on the hull. The seventh operation, engineering, involves manufacture and machining of engine parts, boilers, turrets, etc. This is carried out independently of the general sequence, in separate shops, and machinery is installed during hull erection and fitting out.

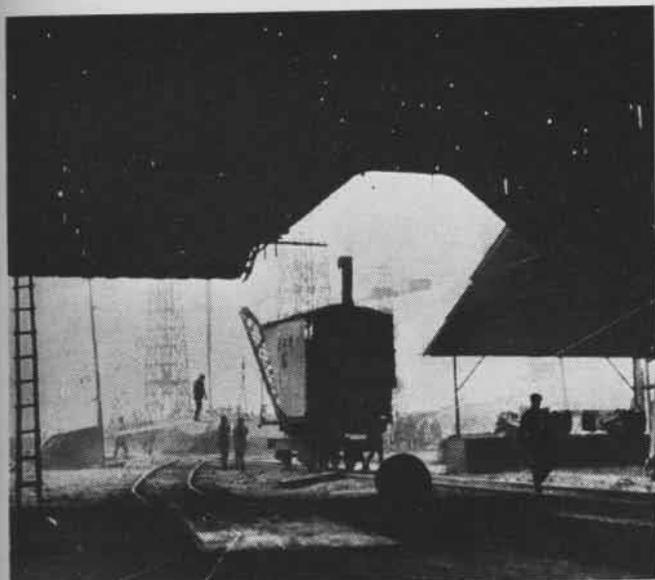


CRANES IN KOBE SHIPYARD CAST LONG SHADOWS. NOTE HULL UNDER CONSTRUCTION AND TWO AIRCRAFT CARRIERS FITTING OUT

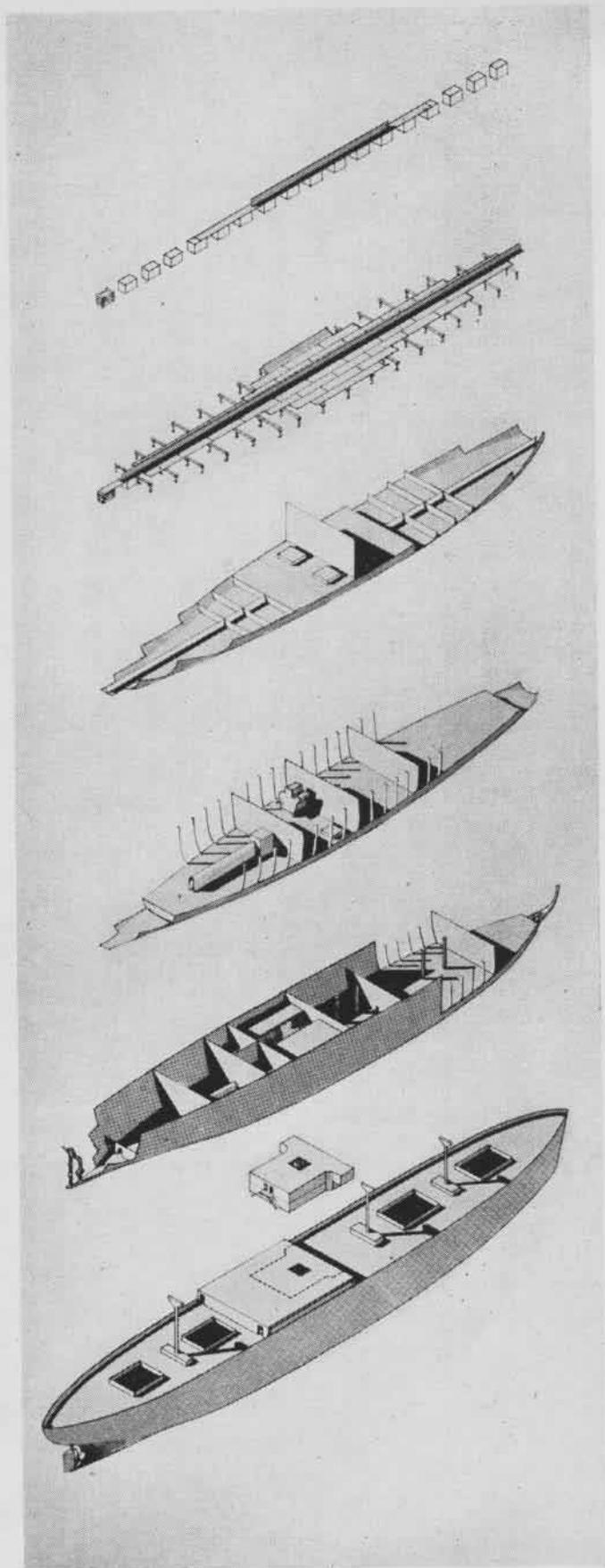


JAPS ARE BUILDING SMALL WOODEN SHIPS AT SCATTERED YARDS

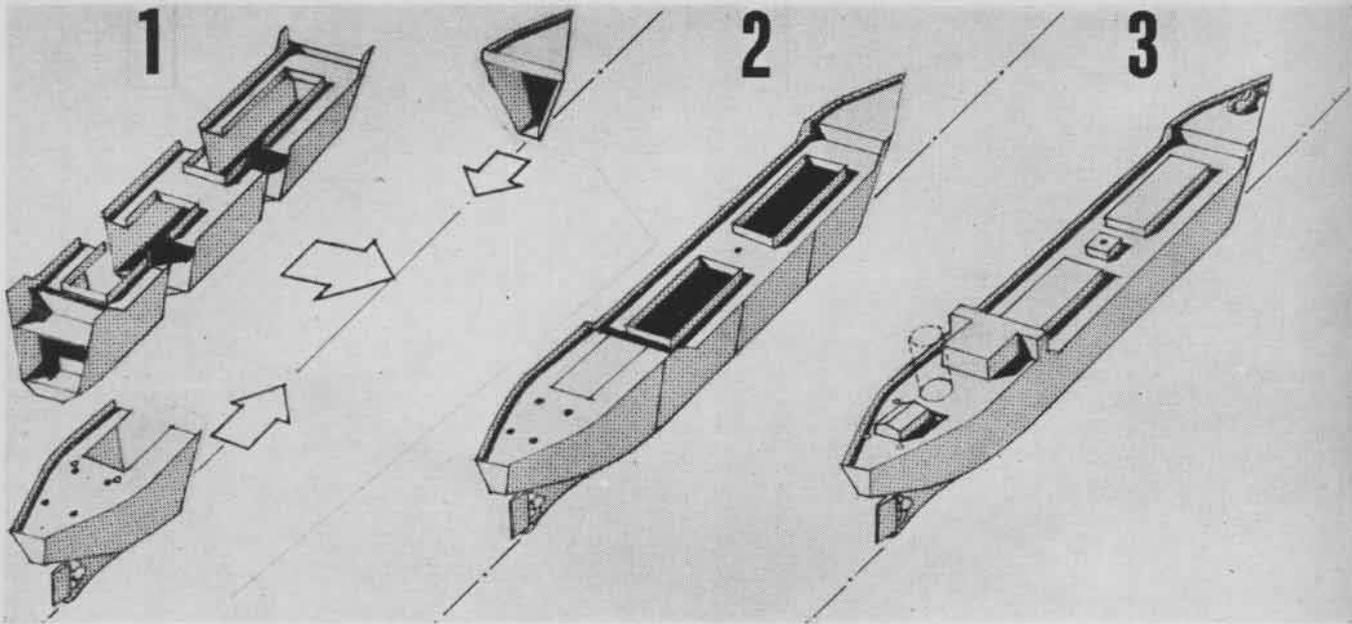
AS A RESULT of years of experience, shipyards throughout the world have evolved similar methods for erecting various types of hulls. These methods were based at first on the use of screws and bolts and later on rivets as a means of connecting structural members. The method of welding has been developed in recent years for making these connections and in the U. S. it has superseded riveting. Welding techniques have been slow to take hold in Japan, possibly because Jap workmen prefer old methods or possibly because of a lack of skilled labor and technicians. Whatever the reason, the Japs are still erecting naval and merchant hulls with obsolete riveted methods. A few smaller yards employ some welding in the so-called "Unit Construction," and undoubtedly some elements of all ships are welded. However, without a wholesale conversion to welding and the ultimate prefabrication and sectional construction, Japan cannot make any substantial increase.



CRANES OF ALL TYPES ARE USED BY JAPANESE SHIPBUILDERS



Drawing shows stages in standard ship construction. Good vertical or oblique photographs usually reveal progress of construction at Japanese yards and enable interpreter to estimate amount of time which will pass before vessel is completed and ready to go to sea



IN JAPANESE "UNIT CONSTRUCTION" SYSTEM HULL IS ASSEMBLED FROM FIVE PREFABRICATED SECTIONS. THERE IS NO KEEL LAYING

## JAPS USE UNIT CONSTRUCTION TO INCREASE PRODUCTION OF SHIPS

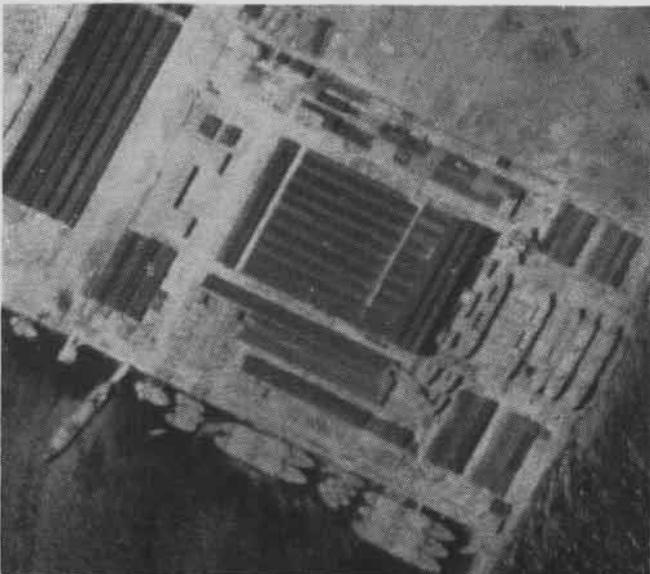
**N**EAREST Japanese approach to mass production in shipbuilding is "Unit Construction," in which the design is simplified in such a way that the hull can be divided into a few units. Each unit consists of side and bottom plating, bulkheads, and decks and is completely pre-assembled. It is then moved or hoisted to the proper fore and aft position and riveted to the adjacent unit to form the hull.

This type of assembly has been photographed at the Jap yard in Wakamatsu, which produces "Standard" 226-foot, type E-2 (modified) cargo vessels. There is no keel laying with this method of construction. In photo at left below it is evident that the three midship sections are assembled in the center building and the bow and stern portions in the side buildings. The five sections then are connected by riveting, the superstructure added, and the ship pro-

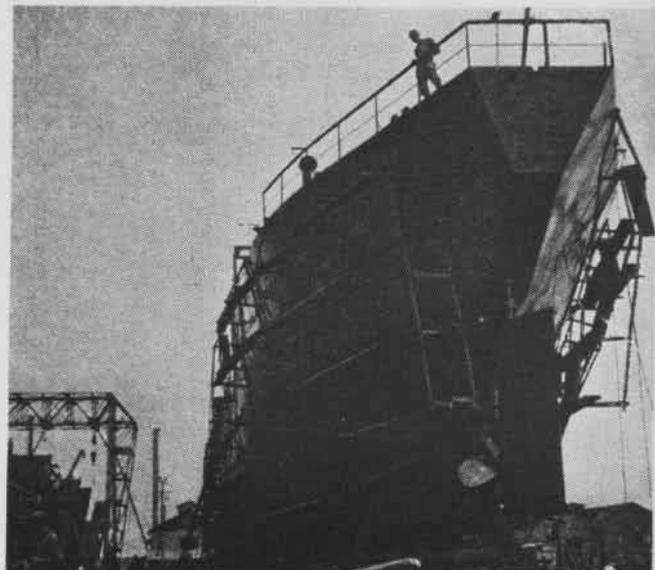
ceeds in assembly-line fashion to side launching ways. In this type of construction flat plate surfaces are used extensively; this speeds up production by eliminating need for bent frames and furnaced plates.

Most new wartime Jap merchant ships are of engines-aft construction. This fact may indicate a shortage of facilities for forging the longer propeller shafts needed in vessels with engines amidships.

**J**APANESE shipyards are tightly integrated. Although there is no typical layout, buildings usually are placed in a specific location because of their relation to other structures and to the general flow of material. In Japan, as in most countries, large and well established commercial shipyards design, construct and repair both naval and merchant vessels. Naval yards build and repair only warships and naval auxiliaries. Electricity is the principal source of power in Jap shipyards. Its use permits the economical arrangement of driving each machine by its own individual motor. In most cases power comes from large generating plants located in city districts where shipbuilding goes on.



AERIAL PHOTO SHOWS ASSEMBLY LINE AT WAKAMATSU SHIPYARD



MANY JAP SHIPS ARE BUILT WITH FLAT SECTIONS OF PLATES



**Enemy is** using former British shipyards at Hong Kong. Here is Kowloon Dockyard, photographed during a Navy strike. At top of photo are storage and building ways, with an unfinished hull on one way and two small merchant vessels in the water, which probably are fitting out. A pair of marine railways appears below the building ways. Cradles for lifting small ships out of the water are visible on the railways, and there is a small con-

trol station for operating the cradle at end of each track. Merchant ships, presumably being repaired, are in each of the two graving docks below the marine railways. Large graving dock near bottom of photograph was not occupied at time of strike. A huge giant hammerhead crane can be seen at water's edge between the large graving dock and bottom of the picture. The enemy evidently uses Kowloon Dockyard mostly for repairing.



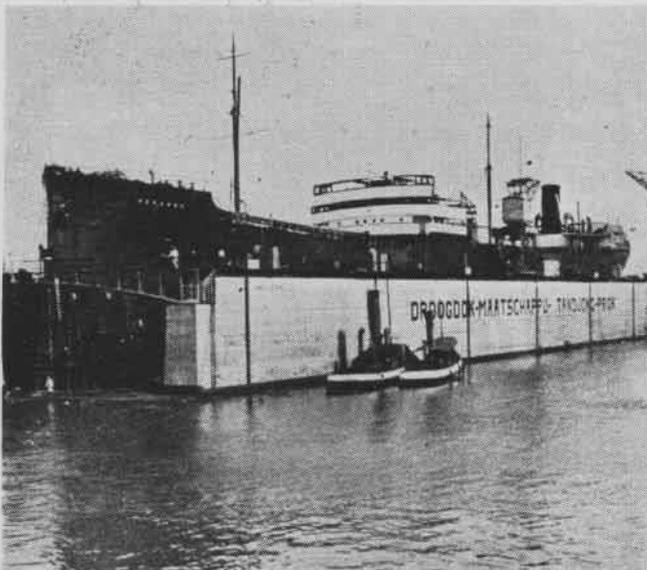
JAPS USE HONG KONG'S MARINE RAILWAYS AND GRAVING DOCKS

## JAPS STRESS REPAIRS TO BOOST SHIP TONNAGE AND OFFSET LOSS

WITH U. S. forces taking such a huge toll of Jap shipping, enemy yards are not able to turn out sufficient tonnage to replace losses. Photographic information reveals that the Japs are concentrating much of their effort on repairing damaged vessels, this being the quickest way to get cargo capacity out on the water.

The speed with which ships can be repaired depends to a great extent on available drydocking and marine railway facilities. Many Japanese yards have some kind of drydocking equipment, either in the form of a graving dock or a floating drydock. Marine railways may be found at a few of the minor yards, where they are used principally for repairing small craft, such as minesweepers and barges.

A graving dock is an excavation in the shore enclosed by walls and a floor, into which vessels may be floated. Japanese graving docks vary in length from 300' to over



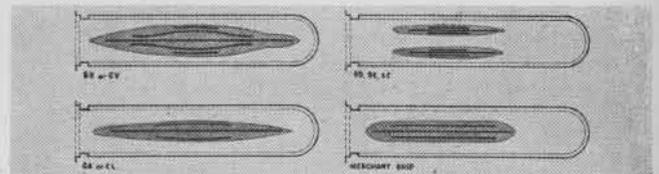
FLOATING DRYDOCKS PLAY VITAL PART IN JAP REPAIR PROGRAM



ENEMY BUILT DRYDOCK AT MALAKAL HARBOR, PALAU ISLANDS

1,000'. After the ship is floated in and centered, the opening is closed by a caisson or gate, and water is pumped out of the interior. The ship then settles on previously arranged blocks.

Floating drydocks are constructed of wood or steel and are capable of being submerged and having a ship floated into position on prearranged blocking. General appearance of all types of floating drydocks is similar. The side walls give longitudinal strength, house pumping machinery,



and afford working space for lifting equipment. A horizontal pontoon, which is divided into watertight compartments, forms the platform on which the ship rests and provides buoyancy. A floating drydock has the advantage of being able to be moved around inside an enemy harbor.



NEW DRYDOCK IS BEING BUILT AT KIIRUN HARBOR, FORMOSA



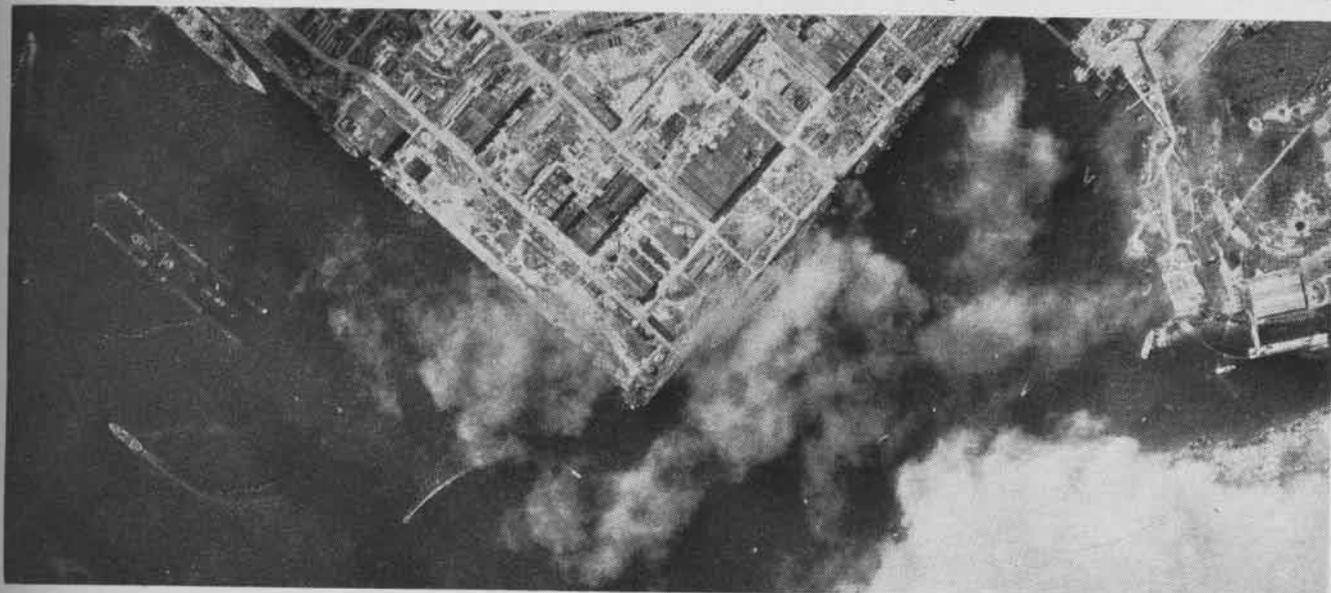
THICK BLACK SMOKE RISES FROM TAIKOO SHIPYARD, HONG KONG, AFTER NAVY PLANES BOMB SHIPPING AND INSTALLATIONS THERE

PHOTO Industrial Study No. 7, "Shipbuilding," prepared by the U. S. Naval Photographic Intelligence Center and the Assistant Chief of Air Staff, Intelligence Hq., Army Air Forces, describes shipbuilding methods in detail, with emphasis on photographic analysis of Japanese yards. This book gives a tabulation of nearly 200 Japanese shipyards, listing their capacity and other information about them which has been obtained from photographs. A detailed study of several large enemy yards also is included. With this general knowledge of shipbuilding methods and good photo coverage, photographic intelligence officers should be able to estimate closely the current activity and importance of a Jap yard.

Logical high priority targets include: (1) ships com-

pleted, or ships launched and fitting out; (2) large vessels undergoing repair; (3) graving docks and floating dry-docks; (4) marine engine shops; and (5) large cranes. All these usually can be located by means of photographs, and damage done can be assessed from post-attack pictures.

The Japs are using former British yards and equipment at Singapore and Hong Kong. Enemy graving docks have been photographed in the Palau Islands, in Formosa, on the China coast and elsewhere. A captured Jap magazine photo shows ship repair at Singapore, with the caption: "These former British docks are now ours and there is no more worry about shipbuilding and repairing." Photo intelligence refutes the second part of this claim, and bombs from American planes can make it still more false.



FLOATING DRYDOCK AT SINGAPORE IS SUNK WITH JAP SHIP IN IT, REDUCING ENEMY'S REPAIR FACILITIES IN MALAY PENINSULA

# GRAMPAW PETTIBONE

## Pass the Word

Flying at 29,000 feet on an oxygen hop, an F6F pilot noticed that his engine surged between 3000 and 3500 rpm. Upon descending to lower altitude, his engine returned to normal, only to surge again momentarily at 10,000 feet. He joined the traffic circle at 1000 feet and attempted to circle the field. Approximately three-quarters of the way round, the prop surged again and the pilot had to make a landing in the nearby harbor when the engine failed completely at 500 feet.

Despite two warnings prior to this final engine failure, the pilot failed to notify the tower of his emergency. The investigating board felt that had the pilot done this and made a straight-on approach instead of attempting to circle the field (approximately 15 miles around) the accident would have been averted.

The investigating board was of the opinion that additional instruction and greater emphasis on emergency communication procedure would help prevent many accidents of this type.



## Tail Wheel Trouble

A considerable number of reports are being received of tail-wheel caster lock damage caused by towing or taxiing planes with the tail-wheel locked.

As pointed out in several BUAER publications, lockable caster tail-wheels should be locked only for take-offs and landings on airfields and for take-offs from carriers. They should be *unlocked* for landing aboard carriers and for *all towing operations*; also, for most taxiing, the major exceptions being to save brakes in strong cross-winds or long taxi-ways where clearance is assured by the tower or signalman.

 Grampaw Pettibone says:

It should be easy to clean up such a simple problem. First, be sure everybody understands what happens when the tail-wheel is locked. Then suggest kindly (followed up with the big stick) that everyone put forth the effort necessary to insure it is unlocked each time before tow-



ing or taxiing. Maintenance and overhaul officers can help by raising a stink in the squadron concerned every time this is not done.

In some cases, entire squadrons need indoctrination on this point, as indicated by the fact that tail-wheel caster lock damage, reported as having occurred in this manner, is listed as material failure, when very evidently it is 100 percent personnel failure.

## Don't Get Boxed

When a PBJ pilot returned to an advance base from a night training hop, he found a rather heavy rain squall surrounding the station. He located the field, however, and made two passes but was unable to get into position to land. His third pass also was unsuccessful. This time, however, he hit the trees at the far side of the field causing a fatal crash.

The investigating board pointed out that it was unnecessary for this pilot to make an immediate landing since he still had 6 hours' gas remaining. They recommended that it be emphasized to all pilots that in cases such as this it is

often advisable to orbit and wait for better weather, particularly in tropical areas where storms usually are of short duration.

 Grampaw Pettibone says:

I once had an instructor who helped me over this hump. He used to say, "It's better to spend a little extra time in the traffic circle than a long time in a box".

## A Poet Is Born

One squadron has turned to poetry to help its pilots remember to lower their hooks before making a carrier landing. When one aviator landed aboard during night carrier qualification with his hook still retracted, he was given the additional duty of composing a few lines of verse which the commanding officer ordered should present "more forcefully to the squadron the full advantage of the check-off list."

The resulting sonnet, unfortunately, was not included with the report of this accident.

## Maintenance Crash

Coming in to land, an F6F-3 pilot could not get his left wheel down. When it became apparent the wheel could not be lowered in the air, the pilot was directed to make a one-wheel landing on the station field. A relatively successful landing was made. The left wing and the propeller had to be replaced however.

Subsequent examination of the left landing gear assembly revealed that jamming of the gear was due to metallic burrs in the yoke bearing. The gear had been removed the week before to facilitate metal work on the stub wing. The bearing was observed to be in good condition at that time.

The investigating board was of the opinion this accident was due entirely to errors of maintenance personnel during reassembly of the gear. Sand or grit was believed to have been carelessly left in the bearing at that time or introduced into the bearing by failure to wipe off the zerk fitting before using the pressure grease gun.



**LOADING UP:** Carrier ordnancemen must study latest training publications so they can load various types of rockets and launchers used by Navy on its aircraft. These men are putting a 5" AR into early-type zero length launcher.



## 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. Who is responsible for insuring that each occupant in a naval aircraft wears a parachute during flight and is familiar with its operation?
2. With the exception of authorized formation flying, what is the minimum distance aircraft must keep from each other in flight?
3. Should your cowl flaps be open or closed after stopping your engine?
4. Why does the back seat man in dive bombing and stunting, etc., often black out when the pilot doesn't?
5. Generator switches should be kept on at all times when engines are in operation, except when?

Answers on Page 48

### Bad Mixture

Following engine failure, a JM airplane was forced down in the vicinity of an advanced base. All but one of the crew were killed.

The investigating board was of the opinion that the cause of the engine failure was "water in the gasoline." This opinion was based on the following information: *a.* The main and auxiliary gas tanks had been filled on the intervening day. *b.* Prior to take-off, 100 additional gallons were taken aboard the bomb bay tanks as reserve fuel. *c.* The plane crew operated the gas truck on this latter occasion, but it could not be determined whether they had properly drained the water from the strainer and segregator. *d.* The gas truck was found to contain water. *e.* Engine failure occurred when gasoline was pumped from the bomb bay tank to the main tank.

The following points were covered in the board's comments:

1. Presence of water in gasoline is apt to be more prevalent in forward areas.
2. Only authorized drivers should be allowed to operate gas trucks and segregator units.
3. Water cut-off valves should be checked periodically to insure proper functioning.
4. All crew members and gasoline truck drivers should be drilled continually and relentlessly upon all possible precautions and checks for guaranteeing against presence of water in gasoline.

► **Comment**—Points 2, 3 and 4 are musts.

### Turn-Up Clearance

A Marine Corps air station reports they recently had an illustrated lesson on the absolute necessity for insuring ample clearance astern when turning up engines.

A visiting R5C was being parked approximately 150 feet, tail to tail, with an R4D, which was being secured. Without looking behind him to see that all was clear, the R5C pilot turned up his engines simultaneously to 2000 rpm. As a result, the flippers of the R4D were blown off and the controls were broken.



*Grampaw Pettibone says:*

Strikes me a good sub-title for this item would have been, "The Unwelcome Guest".

### Misguided Assistance

An ensign pilot and a lieutenant commander co-pilot were forced to land at an Army air base due to rain and generally bad weather. In an uninvited effort to be helpful, the co-pilot pulled the landing gear switch when he thought he was adjusting the flaps. The plane skidded along the runway, causing sufficient damage to send it to thorough overhaul.

The Aircraft Accident Board said:

"It is suggested that persons riding in the co-pilot's seat receive permission of the pilot before operating any of the gear in the aircraft."

### Double Trouble

An F6F pilot made a successful water landing when his engine cut out on a night navigation flight over the Pacific.

This airplane had been downed after the previous flight because the engine



### This Is Bad Practice

Carrying belted ammunition around one's neck makes a pretty picture but is bad gunnery procedure. Ammunition is supposed to be carried in standard cans, not in this manner because bent links and malalignment of cartridges easily can result by such careless handling. This picture of improper procedure appeared in NANews April 1.

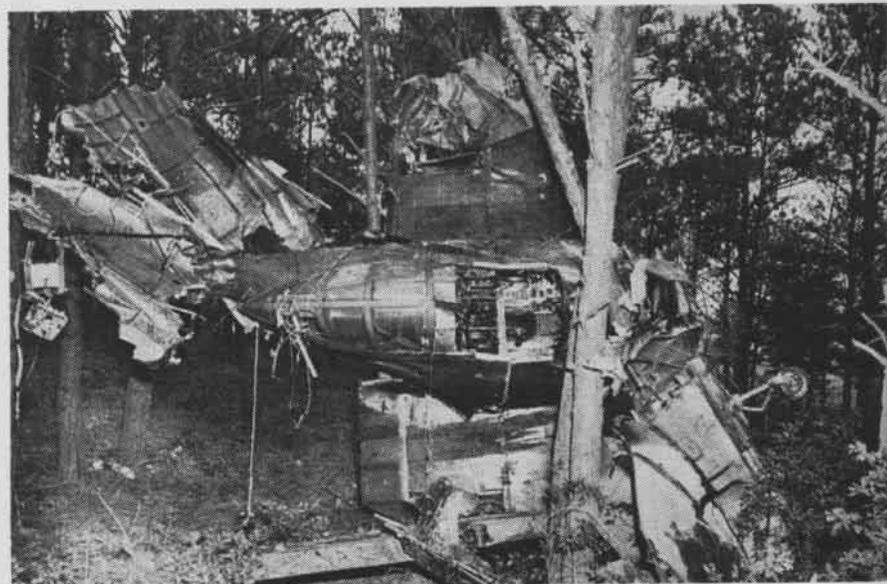
cut out and vibrated. Spark plug leads were changed, plugs were tightened, push rods in number five cylinder were changed and a new cylinder was installed. The engine checked satisfactorily when turned up on the line, but no test flight was made.

The Aircraft Accident Board held that if a test flight had been made within gliding distance of the station field, this engine failure would not have resulted in an aircraft being lost at sea. In addition, the board pointed out that night flights were far from ideal for the first flight after major engine repairs had been made. In such circumstances, this unit now requires that the plane be given a test flight and then complete one day's normal operations successfully before getting more night flying.



*Grampaw Pettibone says:*

Too bad a plane had to be lost to demonstrate the need for such basic safety doctrine. Other units take note. This should be common practice in all cases except combat emergencies.



A PILOT got himself in this predicament one night when he paid more attention to eating a sandwich than to his navigation, plus being unfamiliar with the local radio range, plus failing to shift gas tanks properly. Let it be said to his credit, however, that he did have his shoulder harness secured—which is the only reason he was able to walk away from this wreck and profit by his mistakes. Any offers for this used plane?



NAVY FLIGHT NURSES, TRAINED AT ALAMEDA, ACCOMPANY INJURED MEN TO REAR HOSPITALS FROM IWO JIMA, OTHER WAR ZONES

# FLIGHT NURSES

**A**IR EVACUATION of battle casualties, begun in Guadalcanal days by transport planes which dodged Jap *Zeros* and tropical thunderstorms to save thousands of lives, has been stepped up by the Navy with training of more than 200 flight nurses and corpsmen.

Operating in VRE-1 squadron with NATS R4D's and R5D's, Navy nurses for the first time are flying the Pacific attending wounded men on their way to

rear areas. Training of these nurses, who volunteered for the duty, and hospital corpsmen began last December at the Navy School for Air Evacuation of Casualties at NAS ALAMEDA. Four classes have been given the training since then and are in active duty, flying injured out of Iwo Jima, Okinawa and other advanced war zones.

The Navy has a three-fold purpose for launching its enlarged program of air evacuation: 1. Moving wounded men to rear areas keeps advance base hospitals with low bed capacity ready for emergencies. 2. Quick transportation of injured to large hospitals where specialized treatment is possible saves lives. 3. The morale factor—men who are flying toward home from battle zones get well quicker than if they had to stay in areas being shelled or raided by the Japs.

#### Planes Fly Out Casualties

Air evacuation is not a new idea

with the Navy. Back in 1942 when shipping space was at such a premium, the South Pacific Combat Air Transport alone moved more than 25,000 patients. SCAT was operated under the Marine Corps but moved Navy, Army and Marines to such rear area hospitals as Espiritu Santo, Noumea and Efate. In the Bougainville campaign, 90 percent of the casualties were evacuated by air.

#### Corpsmen Handled Air Evacuation

VRE-1 squadron has 108 nurses and 108 corpsmen, flight surgeons, hospital officers, senior nurses, and CPO's. A network of evacuation routes has been set up and men flown out. R4D's carry 24 litters and R5D's 33. Flight surgeons help screen the wounded, deciding which need the medical care obtainable only at rear area hospitals. Air evacuation personnel accompany planes in relays from the battle zones to the U.S., shuttling back by return plane.



Since Navy evacuation planes may have to fly at high altitudes, nurses and corpsmen check out in pressure chamber at Alameda



Evacuation program transferred to Naval Air Transport Service, with BuMED furnishing medical personnel to fly with big 450's

## Alameda School Affords Nurse Students The Word On How to Use Oxygen and Survive at Sea

AT THE Alameda school, nurses and corpsmen were trained in special problems of air evacuation, such as use of oxygen when flying at altitudes, care of patients aboard plane, ditching, and sea and jungle survival.

Some patients have injuries which will not permit them to be flown out, either because their condition is critical or because altitude may cause bad reactions on them. This type of injury may include men who have had recent hemorrhages, respiratory diseases like pneumonia, heart disease, shock, types

of poisoning, abdominal and chest wounds, gas gangrene and head injuries. In certain cases, decided by the flight surgeon, men with those injuries are not as good "risks" for air evacuation, particularly if altitudes above 8,000 feet are to be anticipated. Planes there fly faster and use less gas.

### Fly in U. S. for Practice

Following their two-weeks schooling at NAS ALAMEDA, nurses and corpsmen spend two or three weeks "practice flying" with injured men en route to hospitals about the U.S. A third of the air evacuation personnel never before have been in aircraft. Neither have many of their patients.

During the first two weeks of training, considerable time was devoted to

teaching them use of oxygen while flying at heights. Practice hops in low pressure chambers gave them their first taste of high altitude sensations and use of masks. Although motionless patients may not need oxygen, an active nurse would, so that she must be able to use her oxygen equipment and administer it to patients if necessary.

### Nurses Give Plasma Injections

Because many patients need medical care while flying over the Pacific, nurses and corpsmen were given refresher training in giving blood plasma injections and first aid. They also are told how to handle psychiatric cases aboard a plane. The latter type, however, are not plane passengers as often as wounded needing rear area treatment.



Technique of inflating life rafts and getting in them is taught nurses. Jungle survival also is reviewed in case of forced landing



First Navy flight nurse to set foot on any battlefield bends over a wounded Marine on airstrip during recent invasion of Iwo Jima

## Flight Nurses Have to Handle Many Varieties of Diseases and Injuries While NATS Plane Flies

**A**IR EVACUATION school gave its nurses and corpsmen practice in loading and unloading patients on stretchers, stowage of medical kits and supplies. They were instructed how to treat all manner of diseases and injuries, from flash burns and shrapnel wounds to malaria, dengue, filariasis, yellow fever, scrub typhus, dysentery and tropical skin diseases.

Patients get air sick just the same as anyone else and have to be treated and fed like any ordinary passenger. Many because of their lack of flight experience have to be reassured. Sometimes drugs must be used to quiet patients who tend to become violent.

### Learn Survival and Ditching Bills

Besides taking care of patients, the nurses and corpsmen must be able to look out for themselves and the men if the plane should have to make a water or jungle landing. Instruction given them includes swimming, water rescue, use of life jackets and rafts and how to ditch. The course includes information on how to survive in jungle areas or on a raft, just in case such an emergency arose.

Although thousands of men were flown out of battle areas in earlier days of the war, not a single patient was lost through plane accidents. Since the Japs held air superiority, their fighters always were a threat. Flights had to be made in the slow, unarmed transports at night, planned so they could land at Henderson Field at dawn, take on passengers and leave at once. This service began a month after landings.

### SCAT Planes Elude Jap Zeros

Many of the 70 to 90 planes used for air evacuation made the long thousand-mile hop from Guadalcanal to New Caledonia base hospitals, flying much of the way only a few feet off the water. This way they were harder to spot from above and the Japs had difficulty in diving on them.

One of the first uses of planes to evacuate wounded occurred when Marines were flown out of Guatemala. The technique was used much during the recent Spanish civil war.

Flight nurses have been authorized to wear three-quarter size flight surgeon gold wings, with Navy nurse insignia in the center. Their summer uniforms will be gray twill and in winter they will wear the regulation aviation green, both with trousers. An optional long-visored cap, like a baseball cap, also may be worn if desired.



FLIGHT NURSE PRACTICES BANDAGING; INJURED MEN FREQUENTLY NEED FIRST AID



FIRST AIR EVACUATION HOSPITAL ON MUNDA SHOWS RUGGED CONDITIONS OF TIMES



SCAT EVACUATES WOUNDED MARINE FROM GUADALCANAL IN 1942; THOUSANDS SAVED



# SHORE STATIONS

▶ **NAS ANACOSTIA**—Continuing this station's policy of aerological personnel studying weather first-hand, aerological officers and enlisted men have been taking to the air on flights when ceilings are low, turbulence strong and icing conditions prevalent. Some flights are scheduled with instructions to look up bad weather and fly in it, as the experience acquaints ground personnel with pilot weather problems, and helps remove that occasional slip between the forecast and the trip.

▶ **NATB CORPUS CHRISTI**—"They've made me editor of the company paper," writes a former reporter on *The Beam* now stationed with the Marines in the Pacific area. "I thought I had a pretty soft job until I suddenly remembered every one of my readers carries a gun!"



▶ **MCAS MOJAVE**—A resourceful recreation department that goes on the theory there never are enough facilities for sports has pulled a new one out of its hat. The combat swimming tank was drained for the winter, and there apparently was nothing it could be used for—then somebody got the bright idea of turning it into a badminton court. It now is one of the most popular spots on the station.

▶ **MCAS EWA**—They say dragon flies are not attending the movies at a certain lonely island base somewhere in the Pacific. The reason is they can't stand the spotlight.

One of them made the mistake of flying across the heads of thumb-twiddling Marines who were waiting for the evening show to begin. A Leatherneck spotted him in the beam of a flashlight.

Instantly other flashlights opened up from various points on the audience, criss-crossing and holding their prey like the giant fingers of aerial searchlights trained on an enemy aircraft. A cheer went up from the crowd.

Veering clumsily, the flying insect escaped the spotlight for a moment, but soon was back in its glare. More cheers. The game went on until show time.

That happened some time ago, and not a single dragon fly has been seen in the vicinity since.

▶ **NAS GLENVIEW**—Organized and operated by enlisted personnel attached to this unit, a "Safety First Cooperative" was launched successfully for the purpose of studying local conditions to eliminate unsafe practices and conditions. Installation of systems and devices to further safety and health have resulted. Each department is represented in the club's safety committee.

The group meets once a week at a designated time and place. Remedial action is planned and reports submitted to the safety officer, who then publishes, and puts into effect, approved suggestions. The command has agreed to grant 48 hour special liberty passes to all men from whom approved suggestions are received.

▶ **NATTC NORMAN**—There's one chief on this station who has been converted to the old philosophy of "Look before you leap." Irritated by crowded parking conditions, he requested Security to check the cars and hand out a few tickets. The chief alone was found at fault, having carefully placed his car in front of a "no parking" sign.

▶ **NAS NEW YORK**—A sailor who was returning to the states after foreign duty was heard to remark as he passed the Statue of Liberty: "Put your torch down, honey; I'm home now!"

▶ **MCAS EL TORO**—The following letter was received by the commanding officer of this station:

DEAR SIR:

I would like to have all the information that you could send me about the Marine Corps. I want to know how I could organize a small band of children my size patterned after the Marine Corps, and how we could make an obstacle course as close to the Marines' as possible with little materials. I am 13, and a few friends of mine I know I could get to join the band are Bob Givens, 13, and Jack Givens, 12, Bud Givens' 10 and Mick Givens, 8, Junior Woods, 12, and LeRoy Woods, 10. What rank could I start everybody including myself with?

Yours sincerely,

FRED NORTON

A reply was sent to the little Marine admirer providing tips which the avid youngsters used in organizing their own neighborhood Marine Corps. This is the first communique issued by the new commanding officer, Captain Fred Norton, USMC-JR.

Blue Army Jr. USMC  
4629 W. 159th St.  
Lawndale, Calif.

Fred Norton  
Capt. Jr. USMC  
Commanding

Jan. 3, 1945

COLONEL FOX:

In reply to your letter of Jan. 5, I want to thank you very much. Today we attack the "Red Army." We are called the "Blue Army." The Reds hold a position a block down the street. We attack at 10 o'clock. We won the fist battle, but we may lose this one, but will fight hard.



I will tell you the outcome later. My side is composed of ten men. Me, a Capt., a 1st Lt., 2nd Lt., MT Sag, Sag, Corp, PFC, PFC, PFC, Pvt. I am going to eat and then we battle. So long.

Fred abruptly ended his letter until after the battle. Here is Communique No. 2:

WE WON THE BATTLE. We rode down on our bikes and surprised them.

Sincerely yours,  
CAPT. FRED S. NORTON

▶ **NATTC NORMAN**—Returning servicemen recall the nostalgic wave of homesickness that swept Palau Islands during a sugar shortage. Emergency supplies of sugar packed in processed rations were wrapped in labels bearing the names of hundreds of



popular restaurants throughout the United States. Reason for the sugar shortage was the allotment of transport space to frozen turkeys being rushed to Pacific bases for holiday menus. The lump sugar, however, didn't solve the shortage. Half the limited supply disappeared the first day as mementos.

▶ **NAS BRUNSWICK**—If NAS NEW YORK or points west are missing one nondescript terrier, they may be relieved to learn that he found not only a good home, but achieved Navy fame. "Sparks," as he is known here, hopped out of a transport plane that made a stop at this station and was at once adopted by the radio transmitter crew. Came dog licensing, and Sparks became the station's Dog of the Year, wearing tag No. 1.

▶ **NAS ANACOSTIA**—The first new runway, measuring 5005 feet, was completed recently and officially "opened for business" by the station's commanding officer who, flying a JRB, set the pace by christening the new runway with a perfect transport landing. This and all succeeding runways will be surfaced strong enough to support a 50,000-pound wheel load.

▶ **NAS MINNEAPOLIS**—The training department uses a sound recording machine to discourage grippers. When complainers approach the O-IN-C, the voice recorder is switched on unbeknownst to the gripper and his tale of woe is recorded on the tape. When he has finished his recital it is played back to him and he gets a chance to hear how his "beef" sounded to the recipient. The treatment is proving a sure cure.

▶ **NATB CORPUS CHRISTI**—Sailors and Marines trekking to Houston and farther east are taking advantage of a GI hotel operated by the Army airfield, FOSTER FIELD. A uniform of Uncle Sam is the only reservation needed for this hotel, and guests are assured sheets, blankets and hot meals.

# TOKYO TALKS

## TO JAPAN

The Okinawa battle is one in which the Japanese have sea supremacy. The naval theatre of this fight is in Japanese waters with Japanese bases nearby. Remnants of the once-proud American Pacific Fleet are fully exposed to the full brunt of Japanese sea and air attacks, the formidability of which American naval forces have learned to know since Pearl Harbor. It is premature to predict anything yet, but it safely can be said that the war situation is advantageous to the Japanese. With a burning desire to crush the enemy, the 100 million people of Japan will not miss this opportunity.

## TO THE UNITED STATES

Of the battle results scored by our air force and our surface fleet against the enemy task force swarming in the Ryukyu area, those confirmed to date and announced in the Imperial Headquarters communique total 107 ships sunk. Among those were 4 aircraft carriers, 4 battleships, 26 cruisers and 16 destroyers.

## TO THE UNITED STATES

Soichi Nakaima, member of the House of Representatives, pointed out it was not the first time his homeland, Okinawa, had been made the objective of an enemy invasion scheme. The United States is known to have had a secret design of invading the Okinawa Islands since the time of Commodore Perry's famous cruise to the Orient in the last century. At that time, Nakaima said, Commodore Perry urged Washington to occupy Okinawa, making it an American counterpart of Hong Kong, British base of aggressive operations in East Asia.

## TO JAPAN

The government of Cochinchina states that at the present moment, individuals in certain localities are trying to profit from the present circumstances. These individuals often dress as Japanese soldiers and even assert that they are acting in the name of the Japanese Army. They go through the villages threatening the inhabitants and carrying off objects of value, and have often spilled blood.

## TO EUROPE (In Spanish)

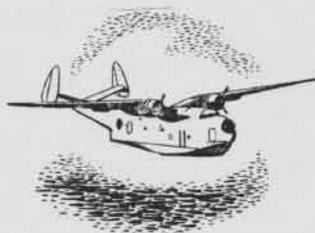
The Franco Government has notified Japan that it will no longer represent Japanese interests in enemy countries. As a basis for this action, the Franco Government alleges that Japan treated unlawfully Spanish residents in Manila. Before the Franco decision, however, Japanese officials hastened to point out that none of the charges were true.

Pressure exerted by the United States brought about such feeble excuses for adopting this unfriendly attitude toward Japan. The United States, immediately after invading Philippine territory, began a systematic campaign of slander against the Japanese Army, charging it with imaginary cruelties. The alleged mistreatment of

Spanish citizens by Japanese is merely one part of the enemy's slander campaign aimed at disturbing friendly relations existing between Japan and Spain.

What causes us the most surprise is not the fact that the Franco Government has ceased to represent our interests, but rather the irritating discourtesy of its procedure, in flagrant contradiction to established international custom, and ignoring the prescribed judicial, and before making an attempt to verify the truth or falsity of hostile acts committed against the Spanish.

## SHOW ME THE WAY TO GO HOME



## Sun Line Approach Flight

As navigator of a PBM you depart Kaneohe, Lat.  $21^{\circ} 27' N$ , Long.  $157^{\circ} 44' W$ , at 2100 GCT on Jan. 9, 1945 for Johnston Island, Lat.  $16^{\circ} 48' N$ , Long.  $169^{\circ} 29' W$ . Your flight altitude is 4000 ft., you have a CAS of 120 k,  $T + 20^{\circ}$ , wind from  $330^{\circ}$ , force 25 k, Var.  $11^{\circ} E$ .

1. What is your MH to Johnston Island? \_\_\_\_\_
2. What is your ETA at Johnston Island? \_\_\_\_\_

You shoot sun lines throughout the trip, and your drift reads close to what was predicted. About 0100 GCT, Jan. 10, while in DR position Lat.  $18^{\circ} 08' N$ , Long.  $165^{\circ} 58' W$ , the following observations of the sun are made. I.C.  $-1'$ , Dome corr.  $-3'$ , watch error 5 seconds fast on GCT.

WT	Hs
00-57-04	$42^{\circ} 03'$
01-02-42	$41^{\circ} 37'$

You plan to begin your single line of approach at 0115 GCT, using a GS of 130 to advance yourself to your 0115 GCT position. To determine headings, use a previously determined wind from  $340^{\circ}$ , force 28 k. Allow a 40-mile error in your DR.

3. What is your MH to sun line? \_\_\_\_\_
4. What is your ETA at the sun line? \_\_\_\_\_
5. What is your ETA at Johnston Island? \_\_\_\_\_

(Answers on page 48)

## TO SAIGON (In Annamite)

Japanese troops, after having eliminated the rebels, are beginning to maintain order and discipline in this country for the sake of security of the Indo-Chinese.

It is regrettable that the people of this country have misunderstood the intentions of the Japanese troops operating in this country. A part of the people, spreading rumors and taking advantage of the occasion, have committed sabotage in French factories, damaged French property and agitated for a general strike. These acts hurt public discipline and are disturbing to security. Japanese authorities should catch all terrorists and punish them vigorously.

Japanese troops came to this country to protect the lives and property of those who help Japan, whether they are Indo-Chinese or French. Local people are warned to avoid such cruel acts for common security and for national defense against the menace of the enemy from abroad.

## TO JAPAN

Inhabitants of the Ryukyus go barefooted because they have no wooden clogs. The people must use the time they might have for making clogs to prepare positions and to whittle bamboo spears to defend themselves against the enemy. They do this because it is the mission of the Japanese people. Every island in the Ryukyus is brimming with this fighting spirit.

Asked about going barefooted, one young girl replied, "If one gets used to it, it is nothing. Do you know that I can now eat sweet potatoes three times daily in a spirit of thankfulness?"

## TO CHINA

China is the enemy's real and ultimate objective. To dominate China completely, in place of Britain and Japan, Japan must be eliminated, and the Soviet Union outsmarted before any substantial Communist spirit of influence is established on the continent. This alone accounts for America's mad push to the westward in the Pacific.

## TO THE UNITED STATES

The Japanese government has called the attention of United States government to the indiscriminate bombing of Naha City, carried out by American planes on October 10, 1944, and in particular to the deliberate inhuman wounding and killing of a large number of innocent civilians.

In view of the fundamental principles of humanity and the guiding principles of international law, which should nonetheless be adhered to even in time of war, the Japanese government has presented an emphatic protest to the enemy and demanded from them an immediate reply setting forth their views regarding such indiscriminate bombing.

The Japanese government as yet has not received any reply from the United States government. On the contrary, in subsequent air raids on Japan proper, the United States Air Force has concentrated its attacks on many non-military objectives.

# DID YOU KNOW?

## Philippine Ribbons Now Approved Navy, Marines, Coast Guard May Wear

Wearing of the Philippines Defense and Philippines Liberation ribbons has been approved by the President for members of the Naval service, including Marine Corps and Coast Guard, and personnel who qualify under the provisions below may wear them (Reference: ALNAV #64, 5 April 1945).

The Philippine Defense ribbon commemorates action of the U. S. forces during the fall of the Philippines to the enemy after Pearl Harbor, while the Liberation ribbon signalizes action in the U. S. return to that important Pacific bastion on 17 October 1944 and the days following.

### PHILIPPINE DEFENSE RIBBON

1. PERIOD: Between 8 December 1941 and 15 June 1942—If they participated in any engagement against the enemy on



Philippine territory, or in Philippine waters, or in the air over the Philippines or over Philippine waters—OR . . .

2. PERIOD: For not less than 30 days during the same period—Were assigned or stationed in Philippine territory or in Philippine waters.

● Individuals eligible under both 1. and 2. above may wear a bronze star on the ribbon.

● DEFINITION: An individual will be considered as having participated in an engagement if he was a member of the Defense Garrison of the Bataan Peninsula or of the fortified islands at the entrance of Manila Bay, or if he was a member of and present with a unit actually under enemy fire or air attack, or if he served in a ship which was actually under enemy fire or air attack, or if he was a crew member or passenger in an airplane which was under enemy aerial or ground fire.

### PHILIPPINE LIBERATION RIBBON

1. PERIOD: 17 October to 20 October 1944—If they participated in the initial



landing operations on Leyte and adjoining islands.

● DEFINITION: An individual will be considered as having participated if he landed on Leyte or adjoining islands, was on a ship in Philippine waters, or was a crew member of an airplane which flew over Philippine territory during such period.

2. PERIOD: Same—If they participated in any engagement against the enemy

during the campaign. ("Participation in combat": See Definition after Philippine Defense Ribbon above.)

3. PERIOD: For not less than 30 days during period from 17 October 1944 to a terminal date to be announced—If they served in the Philippine Islands or on ships in Philippine waters.

● Individuals eligible under any two of the above provisions are authorized to wear one bronze star upon the ribbon; if under all three, two bronze stars.

### SUPPLEMENTARY NOTES & DEFINITIONS

● PHILIPPINE WATERS: East boundary: from 20th parallel north latitude south along 130th Meridian east longitude to Equator; West boundary: east coast of Asia and crossing Strait of Malacca on 103rd Meridian east longitude; North boundary: 20th parallel north latitude plus Gulf of Tonking; South boundary: Equator.

● BRONZE STAR: A five pointed star, 3/16" diameter.

● PRECEDENCE: Next after Area Campaign Ribbons, Defense Ribbon takes precedence over Liberation Ribbon.

● DEFENSE RIBBON: All authorized to wear a bronze star on the Asiatic Pacific Area Campaign Ribbon for the Philippine Islands operation (8 December 1941—6 May 1942) are considered eligible for the Philippine Defense Ribbon and authorized to wear same with appropriate bronze star. Any personnel not so authorized who consider themselves otherwise eligible may submit applications to Chief of Naval Personnel, stating basis for eligibility.

## Navy Issues Activity Catalog

### Committee Suggests Other Publications

Recognizing "the urgent need for standardization of terminology describing naval activities, and an official authenticated list of such activities," the Vice Chief of Naval Operations appointed a committee to develop such a list of activities with appropriate activity designations and definitions.

As a result of the committee's studies, the Navy has published a *Catalog of Activities of the Navy* which contains names and addresses of more than 4,000 naval activities within continental limits of the U.S. Official Edition No. 1, (15 January 1945) has been distributed.

Other publications underway or proposed as a result of the study are a *Catalog of Constituent Units of the Navy*, a list of proposed *Standardized Titles of Naval Activity Types* and a proposed *Dictionary of Naval Activities*.

Revised editions of the *Catalog of Activities* eventually will include activities outside continental limits. They will be published quarterly by BUPERS, subject to the policy direction of CNO. Similar publications will be issued for

activities of the Marine Corps and Coast Guard.

Heretofore there has been no complete, accurate list of naval activities, a fact that resulted in confusion as to exact names, addresses, relationships and functions of many activities. The new



NEW CATALOG LISTS NAVY'S ACTIVITIES

*Catalog of Activities*, which includes periodic supplements and a confidential section, will serve as a basis for: improved mailing lists, sending out notices on establishment, disestablishment and reorganization of activities, uniform pattern of officer and enlisted complements in like activities, improved duty station or location lists for officer distribution, improved personnel accounting methods, and formulation of war plans and demobilization.

The *Catalog of Constituent Units* is a compilation of names and locations of more than 12,000 units of organization not among the seven definitions of an activity listed in the *Catalog of Activities*, but important enough to warrant listing and coding. This catalog will not be published at present, but will be maintained in tabulated list form for those interested. Specific listings will be available upon request to Plans & Operations Division, BUPERS (PERS-2153).

## Mailgrams Not Used In States

### Reports Are Sent By Deferred Dispatch

Speedletters or deferred dispatches will be used in lieu of mailgrams in continental United States in accordance with instructions contained in Communications Circular Letter No. 1-45 (Feb. 1, 1945). Because of the many bureaus and offices of the Navy Department requiring notification of death of naval personnel and of certain aircraft accidents, speedletters are not satisfactory for making reports. Within the continental limits of the United States, reports previously submitted by mailgram should be made by deferred dispatch.



## High Cost of Unpreparedness

**E**XPERIENCE, the old adage says, is the best teacher. Maybe, but when Navy crew members and aircraft are involved, such training may be both painful and expensive.

When mistakes cause a casualty in a squadron, that unit usually gets the word and sees to it that such mistakes are not repeated. In an effort to prevent your squadron from having to learn by this hard route, the following case history is presented:

A TBF crashed in the water immediately after being catapulted. The semi-darkness of early morning made it impossible to determine the cause of the crash. The catapult apparently functioned normally; the plane left deck with ample flying speed. The plane hit the water port wing down, nose down at approximately a 60° angle.

The radioman reported that the plane struck the water with a terrific jolt; the bottom of the bilge seemed to cave in, and that inrushing water and debris stunned him. He was tightly strapped in with his safety belt. When he realized that the plane was about to crash he grabbed the hand grips on the forward wall of the bilge customarily used by the radioman in catapulting. The jar of hitting the water threw him back violently against the seat. He unloosened his safety belt, pulled the emergency hatch release, and started to drag himself out of the hatch.



He was halted for an instant when one of his life jacket dye markers caught on the emergency hatch release. He braced his feet against the fuselage and ripped himself loose. His life jacket functioned satisfactorily when he hit the surface, but he had to keep pulling it down around his neck to keep his head comfortably out of the water in the choppy sea. The radioman suffered bruises, a cut on the left cheek, and a fractured shoulder blade.

The turret gunner reported that he had no time to do anything against the crash but brace himself with his feet against the armor plate. He did not have his safety belt fastened for the take-off. He closed his eyes at the instant of the crash. When he opened them the plane was under water, and he could just see that the top and port side of the turret were crushed. He

could not open the escape hatch so he dropped the armor plate and started to climb down into the radioman's compartment. His parachute harness caught on something in the turret, and he lost valuable time getting out of it. He went for what he thought was the hatch in the bilge, but it was the window. When at last he found the hatch and left the plane, he estimated his position as 20 feet below the surface. On reaching the surface he pulled the bottles of his life jacket, but it did not inflate. He believes that either the bottles had been punctured or else the oral inflation tubes were not screwed tightly shut.



Both radioman and gunner saw the pilot about 20 feet away when they came to the surface. He seemed calm at the time, although there was blood on his face. He called to them to help him get out of "his harness and parachute." They tried to reach him, but in about 30 seconds he disappeared below the surface. A small boat put out by a plane guard destroyer rescued the two survivors 15 minutes later.

This crash spotlights the life and death importance of minor details. Accordingly, although repeated time and again, the following suggestions are offered once more:

1. Pilots' parachutes should not be hooked to the harness during take-off and landing. (T.N. #74-44 says in part, "The parachute must be attached to the harness at all times except during take-off and landings".)
2. Life jackets must be continually checked for intact CO<sub>2</sub> bottles and tightly closed oral inflation tubes. No one knows whether the pilot was too far gone to inflate his jacket or whether it failed to function. The turret gunner could not have stayed afloat much longer in the rough sea without a life jacket. (T.N. #55-44 gives instructions for installing a back strap on life vests to prevent them from slipping over the head in jump or in the water.)
3. Radioman and gunner should not wear parachute harness during take-off and landing but should put them on immediately when the plane is well airborne. (T.N. #74-44—Same as #1 above.)
4. All persons should have their safety belts fastened for take-off. (Article 13-116 of BUAER Manual makes the safety belt mandatory except "when necessary activities require its temporary removal.")
5. The turret should be checked to make

sure the turret clutch is locked in the fore-aft position so that the escape hatch is free.

6. The radioman's compartment should be checked for loose gear each time the plane is manned.
7. A radioman should not brace his feet against the bomb bay window since the jar of a crash may shatter the glass. In this case, the radioman placed his emergency back pack across the window and braced his feet against it.
8. A radioman's canteen or hunting knife fastened at the right side of his belt may become fouled in the seat-back hinge. It is suggested that the canteen be placed over the stomach during the landing and take-off, and that the hunting knife be strapped to the leg.
9. Emergency release handles should be checked as a part of acceptance checks on aircraft. Although, in this instance, the handle worked, subsequent inspection has found some in this squadron which stuck and had to be forced.

## 31,078 Awards Go To Navy Men

Period Listed Covers 37 Months of War

A total of 31,078 medals and letters of commendation have been awarded to Naval personnel during the present war. The list of awards and letters of commendations given during the period from Dec. 7, 1941 to Feb. 1, 1945 includes:

Medals of Honor.....	64
Navy Cross .....	2093
Distinguished Service Cross (Army).....	40
Distinguished Service Medal.....	188
Legion of Merit.....	1505
Legion of Merit to co-belligerents.....	154
Silver Star Medal.....	4285
Distinguished Flying Cross.....	2791
Navy and Marine Corps Medal.....	2019
Bronze Star Medal.....	4088
Air Medal.....	8187
Soldier's Medal (from Army).....	47
Life Saving Medal.....	4
Letters of Commendation	
from President .....	2
Letters of Commendation	
from Sec. Navy .....	1369
Letters of Commendation	
from Fleet Commanders.....	4242

## NATechTra Is Placed in NATC

Organization Change Is Result Of Study

The Naval Air Technical Training Command became an integral part of the Naval Air Training Command in accordance with provisions of ALNAV 39 issued March 3, 1945.

The Chief of Naval Air Technical Training will retain his present functions and will perform such others as may be assigned. He will report directly to the Chief of Naval Air Training.

Naval Air Training Command already consisted of Naval Air Primary Training Command, Naval Air Intermediate Training Command and Naval Air Operational Training Command.

The transfer of Naval Air Technical Training Command was made following a detailed study ordered by the Secretary of Navy and made by Deputy Chief of Naval Operations (Air).

# Take Oxygen—Not Chances

THE FOLLOWING excerpts from *Oxygen Sense*, published by the British Air Ministry, are reproduced to reemphasize the importance of anoxia and oxygen in aviation:

## ACCLIMATISATION

MANY people wonder why it is necessary to take oxygen when flying in the region of 10,000 feet because it is well known that civilisation exists above these heights in mountainous countries: for example, in the Andes and in the Himalayas, natives spend their lives at about 15,000 feet. Mountaineers have climbed to heights very much greater than these.

The greatest height reached without the use of oxygen on the expeditions to climb Mount Everest was estimated



at just over 28,000 feet, and many of the climbers lived for a short time on the North Col at a height of 23,000 feet.

These feats have only been made possible by acclimatisation. This is the name given to the various changes which slowly take place in the body to allow it to function at altitude. The red cells in the blood which are responsible for carrying oxygen are produced in increasing numbers, and a sample of blood from an acclimatised man may contain very nearly twice as many red cells per unit volume as that of a normal person.

In those who dwell at high altitude, the shape of the chest is altered and the lungs develop so that more air is taken in at each breath; other changes which need not be mentioned here also occur.

In order to permit acclimatisation to take place, a period of several days must be spent at altitude. But it is impossible to acquire such body changes during the relatively short periods of time spent at altitude when flying.

## COMMON FALLACIES

Several fallacies have grown round the use of oxygen and its effects on the body. *First*, it is wrong to suppose that too much oxygen can do you harm. The only effect of breathing oxygen in excess of the flows laid down in Air

Ministry Orders is to empty the oxygen cylinders more quickly than necessary and thus to cause waste.

This fallacy probably has arisen from the fact that oxygen poisoning can occur among deep sea divers when breathing oxygen at a pressure far greater than that of the atmosphere. It can be categorically stated that oxygen breathed at the pressures encountered in flight can have no such harmful effects.

*Second*, it is incorrect to say that oxygen has a smell. In fact, the specification laid down for the production of oxygen for use in aircraft states that it must be free from any impurity which would cause it to smell. A faint rubbery smell may, however, sometimes be noticed when the oxygen is first turned on; this is due to the particles of dust which have settled in the tubing being blown out and should not persist for more than a minute or two.

*Third*, it is sometimes wrongly thought that the effects of lack of oxygen on the body can be recognised by the onset of panting or shortness of breath. This is incorrect, and perceptible breathlessness may occur only from lack of oxygen if exercise is being taken. If one is sitting down and the



oxygen supply fails, unconsciousness is more likely to come on without noticeable panting or lack of breath.

## SUMMARY

1. Lack of oxygen affects your brain power. It is stupid, not tough, to think you can do without it. The stupider you get with oxygen lack the better you feel.
2. Lack of oxygen encourages frost-bite and chilling of your body. Ideas will freeze on your brain and slip off.
3. Lack of oxygen makes you tired and encourages air sickness.
4. Lack of oxygen shortens your range of vision, especially at night. Everest climbers manage to do without oxygen only because they have acclimatised themselves during weeks of residence at moderate altitudes. You are not acclimatised, so do not try to imitate them.
5. Don't take risks. Take oxygen.

(See the following motion pictures, available at U. S. aviation film libraries:)  
 MN-1392 *The Physiology of High Altitude Flying*  
 MA-2463 *Use of Oxygen in Aviation*  
 MC-2480 *Physiology of Anoxia*

## BEST ANSWERS

### Birds as Land Indicators

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

1. The albatross, largest of seabirds, is—

- a—an indication of land because it must find land in order to rest
- b—an indication of land because it drinks only fresh water
- c—a poor indication of land because it usually is found far from land during breeding season
- d—a poor land indicator because it can sleep on the ocean and drink salt water

2. If you are adrift at sea in the late afternoon and notice some boobies in flight, you may be sure that—

- a—you are not more than 75 miles from shore, and the boobies are heading toward land
- b—the birds are coming from land that is not more than 25 miles distant
- c—land is at least 100 miles away, but the direction of the flight of the boobies tells nothing of the location of land
- d—the birds are out on their daily fishing excursion and coming directly from land

3. Tropic birds serve best as land indicators when they are—

- a—dark in coloring
- b—in groups
- c—large in size
- d—light in coloring

4. The frigate bird—

- a—is a poor land indicator because it often spends the night at sea
- b—has been known to go more than 1000 miles from land
- c—heads directly toward land during the early afternoon
- d—never spends the night at sea, heads for land at dusk

5. Maximum distance from land that pelicans ("sea crows") normally fly is—

- a—3 miles
- b—10 miles
- c—25 miles
- d—100 miles

6. Birds that migrate long distances from land are—

- a—sea gulls and white terns
- b—penguins and skimmers
- c—skuas and jaegers
- d—cormorants and frigate birds



VETERAN PILOTS STUDY PROBLEMS OF MARINE INFANTRY TO INSURE PRECISION COORDINATION WHEN PROVIDING CLOSE AIR SUPPORT

# MARINE AIR-INFANTRY SCHOOL

SOMETHING new has been added to Marine Corps training. The Marine Air-Infantry School, located at Quantico, Va., teaches battle-wise pilots the fundamentals of ground soldiering, and instructs seasoned company commanders of Pacific campaigns in the essentials of cooperation with aircraft.

Specifically, "the mission of this school is the instruction of air and infantry officers in such general and specialized subjects as have been designated by the Commandant of the Marine Corps with the purpose of increasing their knowledge of both air and ground tactics and the administration of aviation and infantry units. Particular emphasis is placed upon the close cooperation between air and ground forces." The first class including both pilots and line officers started on March 7th, this year.

During the 13-week course, equal emphasis is placed on infantry and aviation subjects—for example, fighter direction, tactics, aerial photo reading, logistics and intelligence. Pilots also become familiar with rifle platoon weapons, demolitions, machine gun tactics, landing operations, terrain appreciation, and signal communications as well as tactics of the battalion and regiment. All fliers must learn and appreciate the capabilities and limitations of the infantry units they are supporting. They find out for themselves why the infantry gets into situations needing close air support, and how they get it.

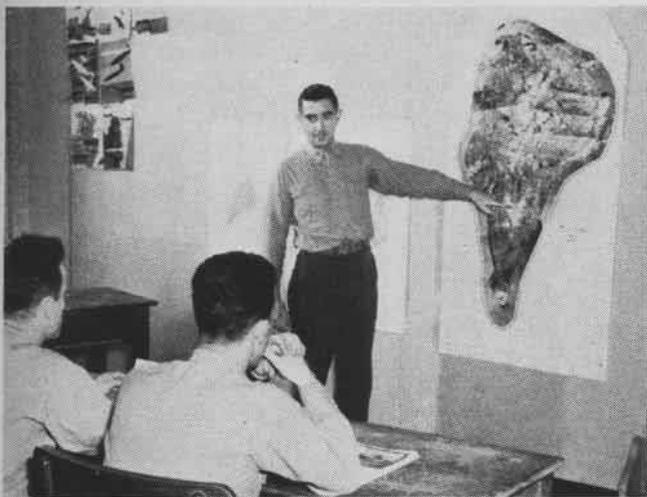
## *Pilots Work As Infantrymen*

Veteran combat pilots are first schooled in the classroom, and then sent out on field trips. Half of the students

participate in the infantry problem, while the others fly support, then the jobs are reversed. In this way, pilots secure a more thorough understanding of Marine aviation's primary mission—that of providing close air support for Marine infantry troops. When pilots have completed the MAIS grooming, they are ready to take over executive and commanding officer jobs in squadrons. Future combat action will find these men directing tactics of battle.

## *Reserves May Apply For MAIS*

Any combat pilot may apply for this school, but preference is given to those pilots who now have regular commissions, who desire a regular commission, or those considered qualified. The latter group includes all reserve officers who wish to maintain their reserve status.



**Military** geography is important to MAIS students. To successfully fill executive jobs in future combat missions, they must understand functioning of air combat intelligence as applied to current operations. Action at Iwo Jima is carefully explained to the class



**Pilots** learn nomenclature and functioning of Browning automatic rifle, the basis of fire power for Marine infantry squads. Course in weapons also includes study of M1 rifle, carbine, machine gun (Cal. .30), 37 mm anti-tank gun, mortars 60 mm and 80 mm



**Synthetic** devices keep pilots in tip-top shape. Panoramic Gunnery Trainer MK. 2 is used as an advanced practice device for turret manipulation and aerial gunnery sighting. When pilot thinks he is in firing position, he presses trigger, and all hits are recorded



**On field** trips, half the pilots assume the role of infantrymen while others fly support. Appointed squad leaders issue combat orders in tactics. Veteran pilots become familiar with problems of ground soldiering, and methods of deploying troops in action



**Many hours** are devoted to demolitions, the preparation and calculation of charges, the functioning and use of mines and booby traps. Theory is followed by actual practice in the field. Here students are setting charges to blow up simulated enemy pillbox



**Scouting** and patrolling problems are executed in the boondocks of Quantico. Working on a pre-written problem, students are told what to look for and where, methods of getting through jungle and patrolling formations. Surprise developments test the pilots

# UNCLE KIM TUSSIE



**FROM THE FLEET:** A large number of friendly planes are still running around without IFF or with very weak IFF. Even though the planes turn out to be friendly the harassing effect is the same as though they were enemy. Furthermore, this condition tends to dull the alertness of the AA personnel who have been alerted numerous times only to be told the bogie was friendly.

**J**UST like Poodi Troxler and a lot more of our kin-folks who come a-snoopin thru th' bresh to git thar jugs filled. They even fergit flashlights to signal us and strike matches fer th' wind to blow out. Sometimes they bring flashlights with weak batteries and try to signal with 'em. They pay no neverminds to thar signalin and that's why Poodi is still a-pickin buckshot frum his hide. And Poodi's lucky he aint a-sleepin under the sweet peas. Hit gives a body a creepy feeling and keeps 'im worried purt nigh to death to haf to keep a-shootin at his friends and customers becaze they fergit thar signals.

**ACTION REPORT:** At 0510 this carrier launched four (4) night fighters in conjunction with the launching of night fighters from other carriers. The radar screen indicated the presence of several unidentified planes in the area. One night fighter was shot and severely damaged by an F6F flying in a formation of twelve F6F's which were evidently a portion of a group's fighter sweep from another carrier enroute to the target. This incident occurred at 0758 and the damaged plane subsequently crashed while endeavoring to land back on its carrier.

**H**IT reminds me o' the night Cousin Fred sent 'im kill sheep-killin dogs.  
"Why can't yer Pappie kill 'em?" I ast Nando.  
"Becaze they air black," he said.  
"Why can't yer white collie run 'em down?" I ast.

"Becaze they nearly eat 'im up," Nando said.  
When I got crost the mountain with Nando, Cousin Fred wuz a-standin at the drawbars a-waitin fer the dawgs.  
"Thar comes one," Cousin Fred hollered.  
"This dog aint a-tryin to kill sheep," I hollered at Fred.  
"He acts fren'ly . . ."  
Just then I saw Nando level his gun and cut down on 'im.

"Got th' sheep killer, Pappie," Nando said proudly.  
When we gathered around the dog, Cousin Fred turned his flashlight on to see if he knowed whose dog hit wuz.  
"Hit's old Whitie," Nando moaned. "Best Collie we ever had. We fergot we dipped 'im in sheep dip today."  
"Everything that's black aint necessarily tainted," I told Cousin Fred and his boys. "Before ye shoot ye oughta git th' sleepy seeds outten yer eyes!"

**ACTION REPORT:** At 1715 while on station a Lt. (jg) was attacked by a friendly VF. Two bursts from a level 6 o'clock run were received. The elevator control, the right aileron, the air speed indicator and hydraulic system were put out of commission. The Lieutenant received laceration from flying glass and small metal particles in the face, neck, body and left forearm. It was necessary for him to apply a tourniquet to check bleeding at the wound on the forearm. On arriving at the ship, the Lieutenant found that his starboard wheel could not be lowered . . . After three wave-offs he succeeded in making what was described as a very forceful landing. Examination of the plane after the landing revealed 101 bullet holes.

**H**IT reminds me of what we saw t'other mornin when we went home from work and run into two men a-fightin.  
"They aint our people 're they Uncle Kim?"  
Possum ast me as we watched the fight.

"Don't expect they air, Possum," I said. "But hit's a one-sided fight!"

One of the men wuz a-beatin the dumplins outten the t'other 'n.

"Gee, Poodi I'm sorry," the man said when he stopped beatin th' other fellar. "I didn't know hit's ye! Hit wuzn't good daylight when ye bumped into me with that jug and . . ."

"Nando, ye've broke a whole panel o' my ribs," Poodi said. "Ye've bit off half of my ear; ye've knocked my upper front teeth out and ye've broke my nose and skint



my face. Hit's a poor time to be sorry atter ye've bit, gouged and battered me until I'm a ruint man!"

Then Poodi swung around with a haymaker that ketched Nando square on the chin. Great-Scotts-and-fire bugs, I never seen sicha lick since the Lord made me. Hit flipped Nando plum over in the air and he come down on his feet a-runnin like a stud terrapin.

"That's how I take 'sorry' fer yer answer Nando," Poodi said. "Next time watch out who ye jump on afore ye know who ye're a-fightin. Hit mought be one of yer bloodkin that won't take 'sorry' fer yer mistake."

# PATUXENT TESTS



JET PLANES LIKE THIS PROPELLERLESS BELL YP-59-A ARE THOROUGHLY TESTED BY SKILLED PATUXENT RIVER PILOTS AND ENGINEERS

## Station Tests Performance Of All Experimental and Service Type Planes, Gear Under Flight Conditions

PROVING ground for naval aviation, NAS PATUXENT RIVER tests planes and aeronautical equipment under actual flight conditions. Authorized just 15 days after Jap bombers struck Pearl Harbor, the station is as much a development of World War II as are the airborne rockets and jet propelled planes tested there. Uniformly superior performances of Naval Aviation equipment on the world's battlefronts attest to the station's efficiency.

Prior to Patuxent River's establishment, the Navy had no centralized aviation testing facilities. Location of individual test units at separated activities materially increased the time lag between an experimental model and delivery of the tested plane under production order.

Navy Department specifications called for an ex-

perimental flight test center in a suitable location where there would be a minimum of interference with other activities and test work could be done with a maximum economy in pilots and aircraft. Personnel would have maximum familiarity with gear tested.

Testing was to be, and is, the station's major activity. Navy personnel rotation insures a continuous influx of operationally experienced officers with new ideas from the Fleet. Dangers inherent in the testing of experimental or untried planes and equipment are willingly accepted by pilots in order to determine deficiencies under observed and controlled conditions. Marine aviators attached to each test department serve in liaison capacities disseminating information on all tests to Marine activities concerned.

NOT A PART of the test program, but a major activity based on the station, is the Atlantic Wing of Naval Air Transport Service Command. COMNATS-LANT and VR-1, VR-8, and VR-9 all are based there.

# PLANES AND AERONAUTICAL GEAR MUST PROVE FITNESS FOR COMBAT

OPERATIONS at Patuxent River begin where ground testing and development leave off. Together the station's five different test departments form a rugged obstacle course designed to ferret out the "bugs" in every airplane and piece of aviation equipment before it is certified for combat use in the Fleet.

Equipment or planes that fail to prove their fitness for combat at Patuxent are turned down completely or returned for modification and possible later trial.

Every service type naval aircraft starts as a specification sheet from the Chief of Naval Operations. Specifications include: intended uses, speed, cruising range, armament, size, weight, rate of climb and maximum ceiling. On the slide rules and drawing boards of engineers and draftsmen in BUAER's Engineering Division these aircraft specifications became an ideal plane in blueprint form.

Manufacturers, called in by BUAER, utilize their experience and production facilities in building models and mock-ups. Factory engineers, the National Advisory Committee for Aeronautics, and later the Naval Air Material Center, and Naval Air Modification Unit check and ground-test the developing plane.

## **Factory Pilot Flies Plane to Patuxent for Trials**

If ground test requirements are met, the plane is assembled and test-flown by a factory pilot. When found ready, the plane is flown by the manufacturer's pilot to Patuxent River for either experimental acceptance or service acceptance trials.

As an experimental model, the plane goes to FLIGHT TEST for actual checking and testing of its flying qualities and characteristics by naval pilots and engineers. If it receives FLIGHT TEST's approval, or if the plane shows sufficient promise to merit further development work, recommendations are made for consideration by the Board of Inspection and Survey. This board, represented at Patuxent River,

passes on the advisability of purchase of naval equipment and makes recommendations to the Secretary of the Navy.

Experimental models also must pass RADIO TEST and ARMAMENT TEST. These departments, with FLIGHT TEST, comprise the station's three engineering units. Aircraft passed as experimental planes soon return as pilot line models for service acceptance trials.

## **Service Test Is Part of Integrated Aeronautic Program**

Two other Patuxent River departments that operate under supervision of the Director of Test and the direction of the Commanding Officer are SERVICE TEST and TACTICAL TEST. As a field unit of the Maintenance Division of BUAER, SERVICE TEST is entirely concerned with checking maintenance requirements and structural weaknesses of naval aircraft. An important part of the Navy's Integrated Aeronautic Program, this department makes possible a scientific approach to the aviation maintenance problem and the logistics of aviation supply. TACTICAL TEST, among many other functions, evaluates airplanes and new aeronautical equipment from the standpoint of most effective combat tactics.

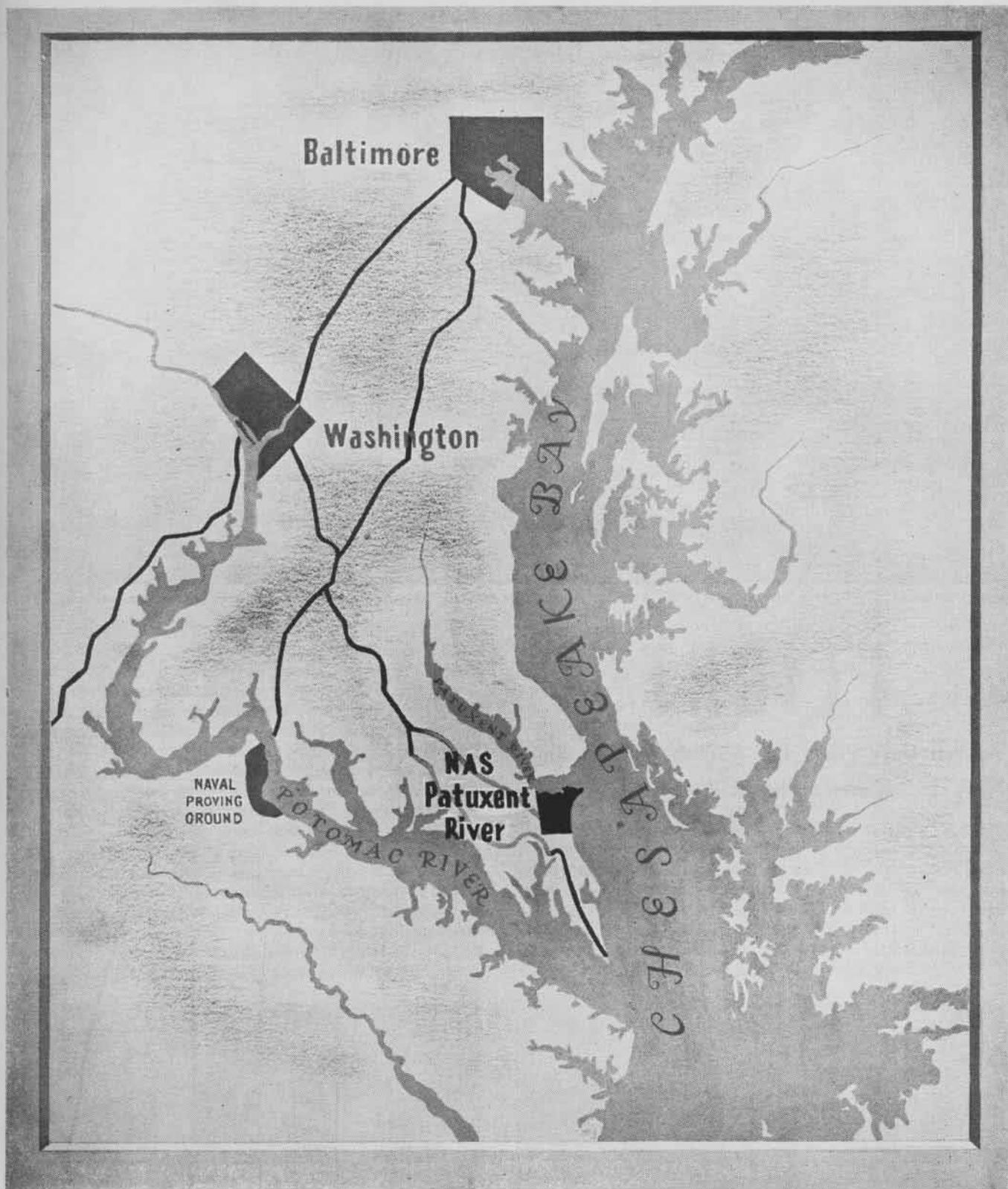
## **Project Reports Quickly Disseminated to the Fleet**

In addition to checking planes, Patuxent River departments carry out tests on all major modifications of service type planes and aeronautical gear. Complete reports on all tests are disseminated to Fleet commands and certain other activities. BUAER assigns most project priorities including all "A" and "B" priority listings. The Commanding Officer specifies priorities of all projects not determined by BUAER.

Despite exigencies of war, all test operations at Patuxent meet rigid standards of accuracy and completeness. Pilots and engineering specialists work together as a team on every project. More than half a million photographs a year go into reports to provide a graphic record of all tests performed.



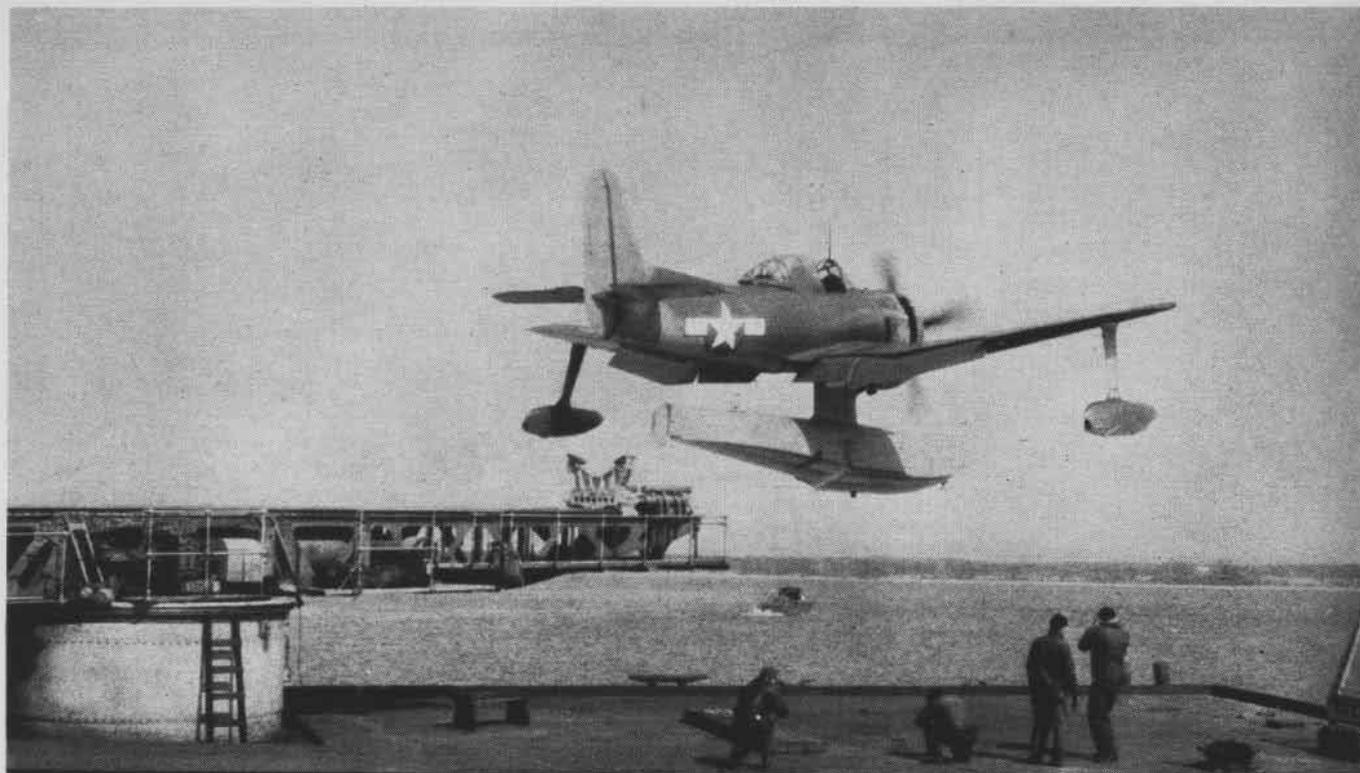
IF IT'S A NEW COMBAT AIRCRAFT YOU'LL SEE IT AT PATUXENT RIVER; TECHNICIANS SERVICE A VARIETY OF PLANES ON HANGAR APRON



**T**EST DEPARTMENTS and other activities at NAS PATUXENT RIVER are dispersed over an area larger than Iwo Jima. When the Navy Department authorized an experimental flight test center certain requirements as to location were fixed. The site was to be convenient to both BUAEF and to the Naval Material Center, near the seacoast and rough water, on terrain favorable for forced landings, and in a relatively unpopulated area where gunnery and bombing tests could be conducted safely. An area 60 miles from

Washington at the junction of the Patuxent River with Chesapeake Bay, known as Cedar Point, Md., met specifications. Later, to avoid confusion with Cherry Point, the station's name was changed to Patuxent River. Suitability of the location for NATS use was a contributing factor.

On the station, according to local legend, is the site of Francis Scott Key's summer home. Not far away, naval personnel at ARMAMENT TEST fire present day counterparts of the rockets Key immortalized in the *Star Spangled Banner*.



VO/VS PROJECT OFFICERS CONDUCT CATAPULT TRIALS TO DETERMINE THE NEW SEA HAWK'S PERFORMANCE UNDER ALL CONDITIONS

# FLIGHT

## Veteran Navy Pilots Put Aircraft Through Rigid Trials To Determine Plane's Worth For Fleet Use

**F**LIGHT TEST is to experimental and service type aircraft what the check pilot is to an aviation cadet. A "down" from FLIGHT TEST has saved the Navy from buying more than one airplane that looked pretty but would not have delivered in combat. Every plane tested is appraised for its flying qualities and performance characteristics. The basic yardstick is a Navy Department specification sheet.

Historically, FLIGHT TEST is the oldest of Patuxent River's

five units. It was commissioned at NAS ANACOSTIA, Jan. 1, 1927, with three officers and 20 enlisted men. In those days the Navy procured planes on the basis of competitive tests. Navy pilots flew any plane a manufacturer could get to Anacostia, and, in the words of one veteran pilot, some real "Goldbergs" turned up there.

Performance standards and trial techniques established at Anacostia are the basis of methods employed today and in a large degree are responsible for the high quality of aircraft supplied to the Fleet.

FLIGHT TEST, which moved to Patuxent in June, 1943, conducts both acceptance and production inspection trials under cognizance of the Board of Inspection and Survey and other projects assigned by BUAE. Detailed instructions accompany each project, actual procedure is left to the project officers.

Aircraft in the FLIGHT TEST hangars range from pro-



Navy pilots flight-test helicopters to determine water landing characteristics, weight lifting capacities under controlled conditions



Engineer uses a Brown Recorder to tabulate temperatures and temperature changes of all important engine points during test



**Tigercat** with tricycle landing gear and arresting hook down, comes in for simulated carrier landing during Patuxent flight test

propellerless jet "X" models to standard service types there for production inspection trials. Tests leave nothing to chance; every phase of an airplane's performance is checked and rechecked. A project engineer works with the pilot in evaluating and recording results. Frequent trouble reports recommend changes necessary or desirable to make a particular plane acceptable for service use. Two airplanes of each model up for a service acceptance trial are flight-tested.

#### **Planes Undergoing Trial Must Convince Test Pilots**

Approximately every one-thousandth airplane produced under Navy contract is flown directly to Patuxent River for inspection trials to determine whether or not BUAER specifications are being constantly maintained.

Test pilots must spot the faults and weaknesses in planes they check. It is necessary that a **FLIGHT TEST** pilot be able to recognize good and bad flying qualities in an airplane and know how to evaluate each. Because he has always flown tested and accepted aircraft, the average naval aviator finds it difficult to recognize bad flying characteristics.

A plane to meet specifications must be good enough to convince even a pessimistic pilot. At Patuxent every airplane is flight-tested for an imaginary character pilots call Ensign (jg) Buzzsaw. The plane must exhibit flying qualities that will make it safe and effective even for him.

**FLIGHT TEST** endeavors to get and tabulate opinions of as many pilots as possible on each plane. Reports of one or two pilots are never taken as final and in the course of a



**Late model Corsair**, undergoing flight test, joins up with the propellerless YP-59-A jet propelled plane during experimental trial

week a dozen men may fly one particular plane. Projects assigned are broken down into the VF, VSB-VTB-VO/VS, VPB-VJ-VR, and VH-VK-VN classes. Special projects are set up for flight-testing of helicopters, Army, Allied and captured enemy aircraft.

Every complete inspection or acceptance trial includes: demonstrations—strength requirements, temperature survey, weight (both empty and with load), critical altitude, Vmax (curve of power and altitude), stalls, climb, take-off distance, stability, reduced engine performance for multi-engine planes, rough water tests for seaplanes and amphibians, exhaust flame visibility and defueling. Catapult and arrested landing gear make carrier acceptability trials possible.

#### **Temperature and Detonation Studies Are Part of Test**

In every project special flight-testing instruments must be carefully calibrated and checked. Frequently it is necessary to substitute instruments of known reliability.

The power plant section conducts fuel consumption and range tests, temperature surveys, studies of aircraft engines at higher power ratings, and detonation. In other tests experimental aviation fuels are evaluated. Detailed performance records on engines of tested aircraft under all flight conditions go into every final project report.

Addition of new armament, radar equipment or any other modification that changes the configuration of a service type plane must be completely tested. Flying characteristics can be changed by even minor internal modification.



**Chesapeake Bay** and ocean areas provide both smooth and rough water for the adequate testing of take-off and landing characteristics

of seaplanes like the new Curtiss *Sea Hawk*. All planes must prove their strength and durability to satisfaction of pilots

# ARMAMENT

**All Airborne Ordnance Equipment Must Prove Worth In Rigid Patuxent River Flight and Ground Trials**

**I**N TRIALS under actual flight conditions, ARMAMENT TEST discovers and eliminates "bugs" in aviation ordnance destined for the Fleet. Equipment that fails to meet Navy contract specifications is either turned down completely or modified to meet requirements. BUAEER, and through it BUORD, assigns test projects. Reports are utilized by the Board of Inspection and Survey in making decisions, and by the Fleet for correcting engineering deficiencies discovered only after aircraft became operational.

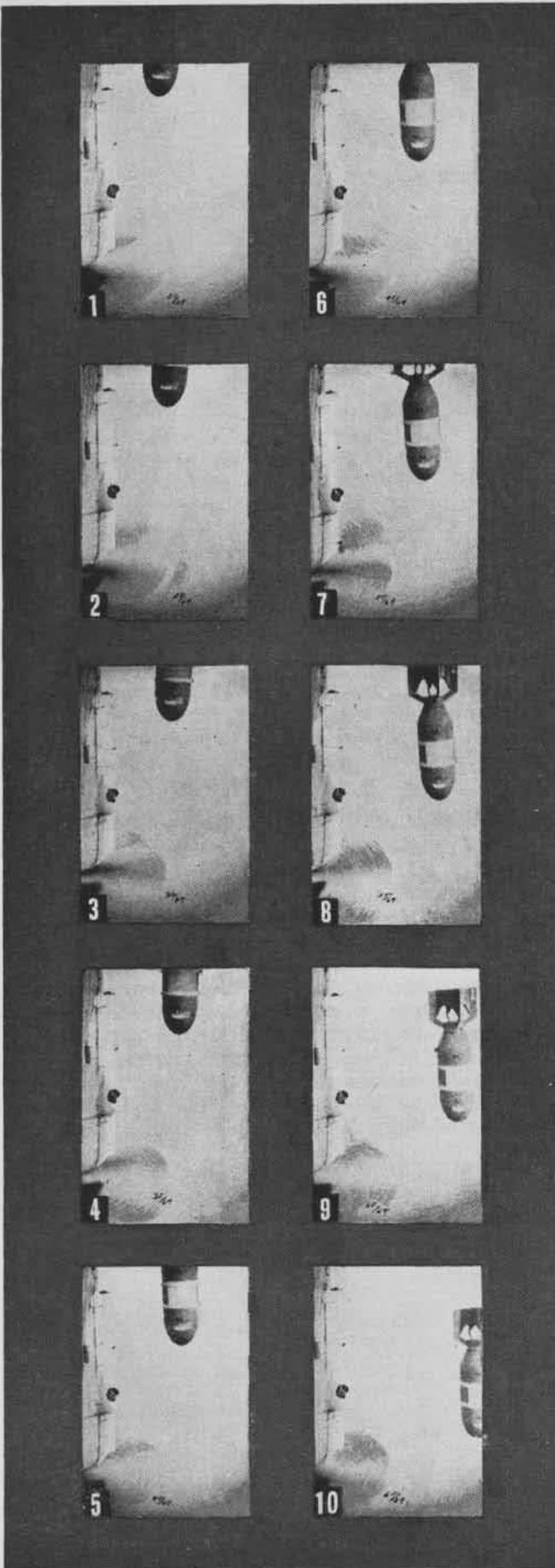
At any one time, projects are underway on at least a dozen different planes ranging from pilot line production models to standard service aircraft rigged with armament modifications. Most pilots at ARMAMENT TEST are veterans qualified to measure good and bad points of airborne ordnance in the light of their own combat experience. Their job is testing equipment and installations on a specific airplane during combat maneuvers standard for that plane. ARMAMENT TEST last year fired 1,325,000 rounds.

## **Prompt Fleet Reports Speed Armament Improvements**

Armament installation deficiencies reported by service units are referred immediately to Patuxent for investigation. Modifications or new uses of armament developed by Fleet units receive thorough trials; frequently an idea can be adapted advantageously to other planes. Projects vary in nature from trying out a new type bomb hoist to evaluation and statistical analysis of airborne electronic fire control.

In flight trials ARMAMENT TEST project officers discovered that an experimental fighter's gun installation resulted in overheating of barrels and consequent tumbling of bullets in flight. Without waiting for the contractor to make changes, test unit officers designed and installed a new system of cooling guns, correcting the trouble on the spot.

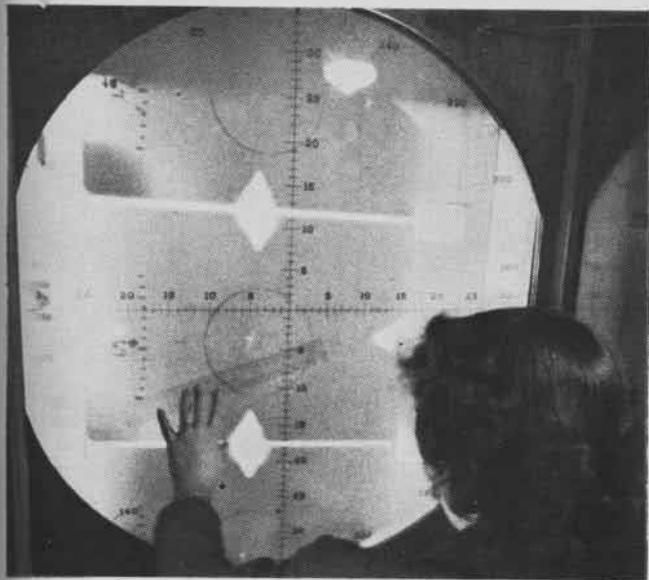
Prompt Fleet reports of troubles encountered in armament installations or equipment expedite investigation of troubles that may become general if not corrected. A trouble-



**Specially rigged** gun camera, records release of a 2000 lb. bomb to determine amount of prop clearance on SB2C in a steep dive



**Armament Test** hangar apron has facilities for ground-firing at either water or land targets like the large cement butt on the left



Motion pictures made during assessment runs calibrated on bomb sight projector are accurately read by skilled WAVE operator

some F4F gun-jam, promptly reported by a Fleet unit, was remedied by an ARMAMENT TEST-designed link ejection head.

#### Thorough Ground Testing Precedes Flight Trials

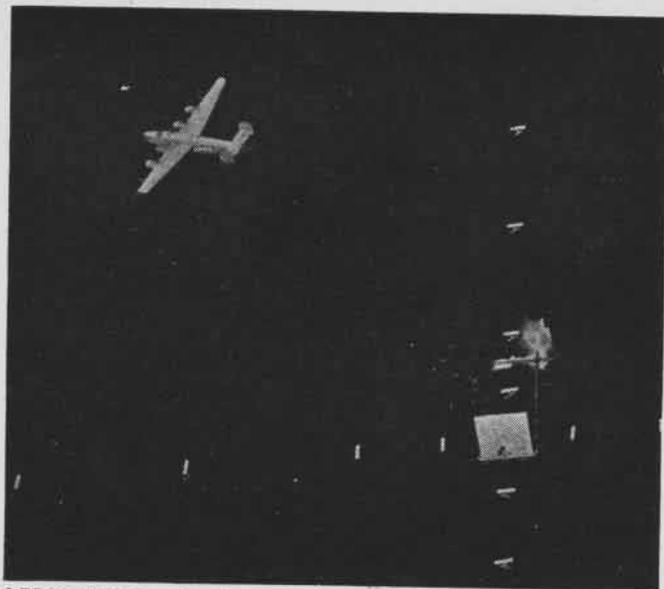
Complete ground tests utilizing low temperature rooms, altitude chambers, vibration tables, synchronization machines, and a centrifugal gun testing device, when appropriate, precede flight trials. With the centrifugal gun testing machine, aviation guns and cannon are mounted at the end of a 10 ft. rotating arm that turns at speed sufficient to provide forces of acceleration up to 14 G's while guns fire.

Ground firing range area adjacent to the hangar covers a portion of Chesapeake Bay with water targets at 500, 1000, and 1500 yds., and concrete butt land targets set at 250 yd. intervals. Large water areas, including Chesapeake Bay from Cove Point to Point Lookout and an off-shore operating zone provide ranges for aerial firing.

The National Defense Research Council, cooperating with ARMAMENT TEST in the study of fire control, uses a wide variety of laboratory equipment for testing and evaluating airborne fire control components and systems.



From Armament TEST's specially designed cold chamber, engineers ground fire machine guns and cannon in temperatures of  $-75^{\circ}$  F.



A PB4Y releases a bomb over a specially constructed target in an ARMAMENT TEST project for the evaluation of a new bomb sight

Patuxent River rocket tests began early in 1943 using a *Hellcat* rigged with a 90" launcher. Though unsuccessful in the initial trials, this and later projects aided in developing the Navy's fighter-borne rocket techniques in use today. Rocket blast effects are analyzed with a 4000-frame a second high speed camera.

#### Armament Test Unit First Operated at Norfolk

Tests of experimental gear, or equipment with known deficiencies, have not been carried through without casualties. One ARMAMENT TEST pilot met death when a fighter he was diving at high speed disintegrated. The test was designed to determine effects of windshield deflections at high speed upon the accuracy of gun fire.

Commissioned in June 1941 at Norfolk as the Aircraft Armament Unit, the department moved to Patuxent River in July 1943. In its first six months at Norfolk the unit completed 42 projects. Its workload since has increased with the tempo of war. Tests that prior to the war required a period of months, now are rushed to completion in a fraction of the time without sacrifice of accuracy or thoroughness.



Armament Test project officers conduct a night firing flash test with the SC-1. The spinning propeller arcs across tracer paths



RADIO TEST ART PROBES FOR NOISE INTERFERENCE INCHES BEHIND SPINNING HELLCAT PROP; SECOND ART READS VHF RECEIVER

# RADIO

## Electronic Engineers Work With Pilots To Flight Test Acceptability of Equipment and Installations

VETERAN Navy pilots back from combat and electronic engineers check radio and radar gear under flight conditions at RADIO TEST. Planes equipped as flying laboratories are flown for the sole purpose of determining whether or not radio and radar gear perform the jobs it was procured to do. Pilots fly new combat-type planes to test both the contractor's radio or radar installations and prototype installations of proposed service changes.

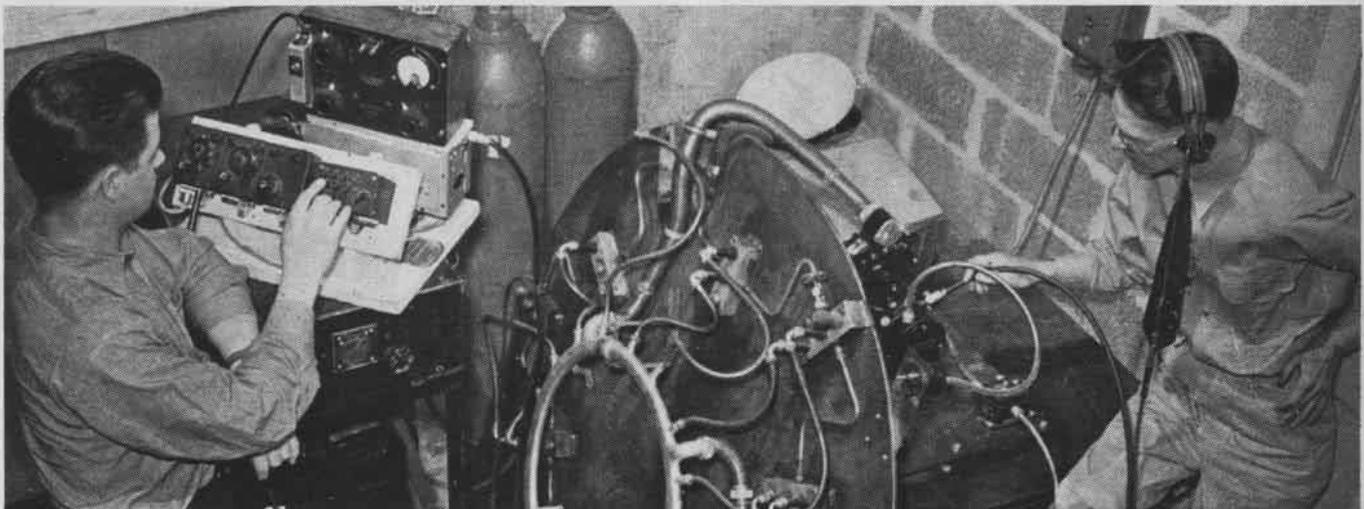
All projects are assigned by BUAE's Engineering Divi-

sion. As an engineering unit, RADIO TEST conducts both service acceptance and production inspection trials for the Navy's Board of Inspection and Survey. Rapid developments in equipment plus continuous modifications in airplane design, and uses provide many projects.

Prototype equipment and experimental planes under consideration go to RADIO TEST at an early date for flight trials. Location of electrical gear in the plane is all important from a performance standpoint. Good electronic installation technique is based on consideration of flight characteristics, weight, effect on electrical interference, and access of gear to operators and maintenance personnel.

### *Patuxent Tested Radar Now Is In Use In Fleet*

Electronics engineers in the antenna shop conduct tests on models rigged with miniature radar gear duplicating to scale equipment on the aircraft. With higher frequencies, engineers are able to form antenna patterns identical to



ENGINE NOISE THAT INTERFERES WITH PLANE'S RADAR AND RADIO CAN BE LOCATED WITH THIS HARNESS BENCH TESTING DEVICE



ART BENCH TESTS DIRECTION FINDER IN COPPER SCREEN ROOM

those of the model's service counterpart. In some tests a model control tower is used. Since specific antenna patterns are required for every type airplane, engineers in testing and evaluating radio or radar equipment must constantly keep in mind the plane's intended tactical uses.

In their own operations tower, RADIO TEST engineers check and calibrate both ground and airborne installations used on specific projects. In one test the tower kept constant radio contact with a plane on a flight to Brazil.

Equipment that has gone through RADIO TEST and on to the Fleet includes the Edward's Window Dispenser, APS-3 wing nacelle, APS-2 retractable radar gear, APS-4 jettisonable gear, IFF, VHF, MHF and life raft corner reflectors.

Radar specialists back from combat duty appraise experimental equipment in the light of practical experience. As a radio counter-measure officer aboard a CA during one of the Navy's early amphibious operations, one of these RADIO TEST engineers utilized RCM to identify five enemy



MILLING MACHINE IN INSTRUMENT SHOP IS ACCURATE TO .0005

fighters approaching in the guise of friends through use of a compromised IFF signal. Had RCM not disclosed additional radar waves, easily identified as enemy, the attackers might have penetrated the task force screen.

On the top deck of RADIO TEST's hangar, facing Chesapeake Bay, project engineers carry on continuous bench-testing of radar. Work accomplished there is highly important in keeping electronic equipment second to none.

#### **Ideas From Operational Activities Aid Tests**

The unit came to Patuxent River in July 1943 from Anacostia. Through the Radio and Electrical Branch of BUAER's Engineering Division close liaison is maintained with both BuSHIPS and the Naval Research Laboratory.

Ideas from Fleet and shore-based activities, relayed by BUAER, are carefully investigated by RADIO TEST since most electrical advancements in this war have resulted either directly or indirectly from Fleet requirements or suggestions.



RADIO TEST DRAFTSMEN PREPARE THE HIGHLY DETAILED AND ACCURATE DRAWINGS AND BLUEPRINTS THAT GO IN PROJECT REPORTS

# SERVICE

## Test Department Determines Maintenance Needs Of Aircraft Through Accelerated Flight Program

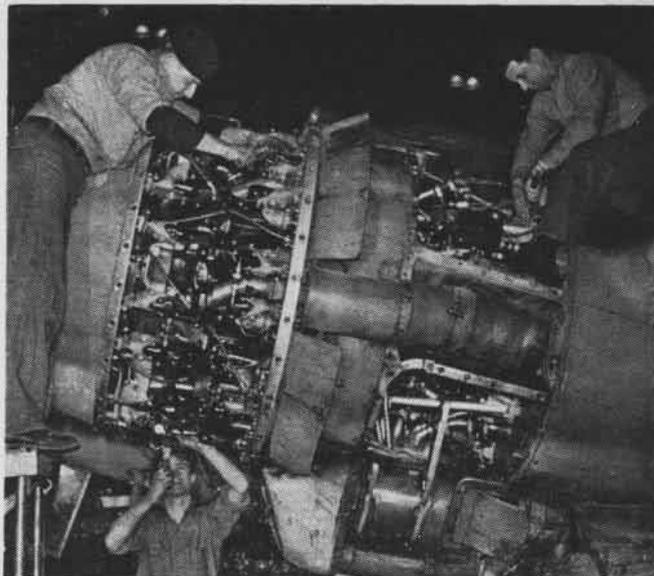
**F**LYING is a means to an end at SERVICE TEST. Newest of Patuxent's five departments, its mission is to discover and report material defects of airplanes and their equipment and to disseminate vital maintenance information at the earliest possible date. All projects are assigned through the Field Service Branch, Maintenance Division of BUAER.

To assemble sufficient maintenance data on a particular plane before it goes to the Fleet in quantities, SERVICE TEST conducts an accelerated flight program. In three months a fighter plane goes through a flight syllabus equivalent to its normal combat life in the Fleet.

This accelerated flight test uncovers all major material defects in the plane and its equipment. Servicing gear, peculiar to the plane under accelerated test, is checked at the same time to determine its practical usage value.

Established in July 1944, the department is a result of recommendations made by the Radford Board in its Integrated Aeronautics Maintenance, Material and Supply Program. Its place in the overall program is to find defects rapidly and report them to BUAER promptly for remedial action. Unlike other Patuxent departments, SERVICE TEST is not primarily concerned with evaluating flight qualities or tactical uses of aircraft and equipment.

Initial models, usually three, just off the production line, are flown to Patuxent River. Without wasting a minute, assigned pilots begin test operations, flying a maximum of 21 hours out of 24 on a standard combat syllabus. If the tested plane is a dive bomber it goes through the vsb syllabus, if it's a fighter the vf syllabus is used. Four pilots, whose training and experience approximates that of the



Maintenance facilities at SERVICE TEST purposely approximate those of a CASU; here technicians ready pv-2 for night flight

average naval aviator in the Fleet, are assigned to each plane. Maintenance facilities at SERVICE TEST purposely approximate those of a CASU or PATSU.

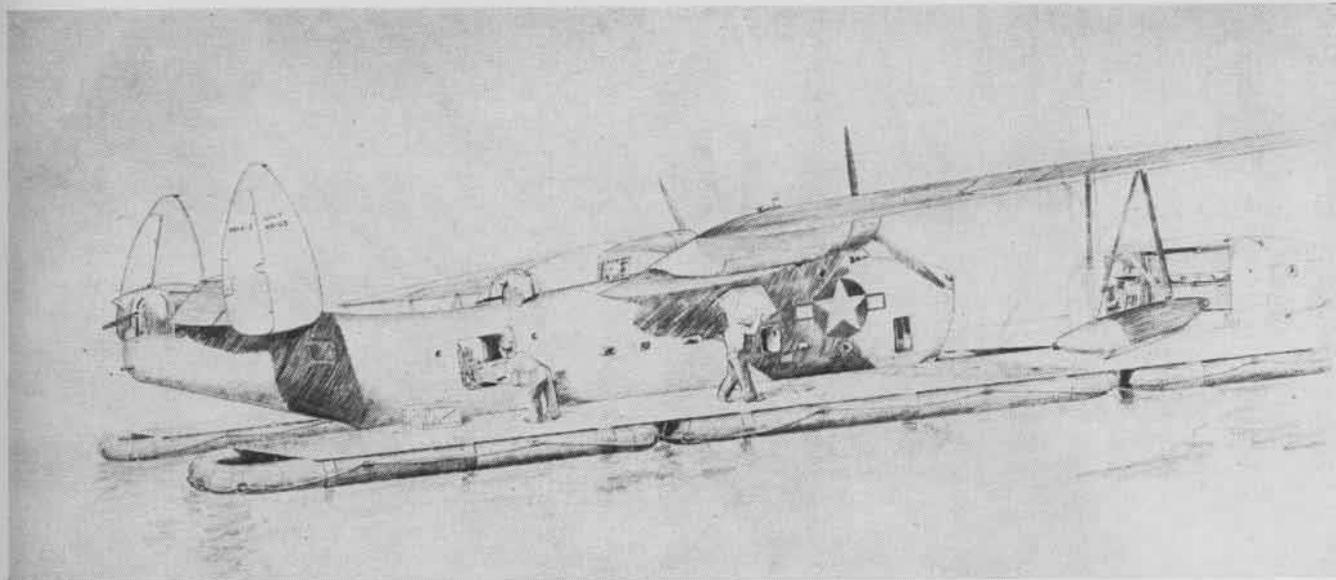
### Unit Sends In Average Of 50 RUDM's a Month

While weather conditions and occasional service difficulties cut into the accelerated flight program, most single engine projects are completed within three months. Single engine planes receive 450 hours of flight time, multi-engine aircraft 1200 hours. Progress reports on projects issued twice a month go to Fleet air commands, BUAER desks, BAR's, ABATU, NATTC Chicago, and certain other activities.

SERVICE TEST sends an average of 50 RUDM's a month to BUAER, probably more than any other single unit in the



MARINE GUARD STANDS BY AS TECHNICIANS AT SERVICE TEST REFUEL A NEW TORPEDO BOMBER UNDERGOING AN ACCELERATED TEST



**One of Service TEST's** special projects assigned by BUAER is this advance base seaplane service unit. Equipment shown in the

preliminary sketch will be tested at Patuxent River. New type servicing and maintenance equipment as well as planes are tested

Navy. These RUDM's made on a dozen planes simultaneously undergoing accelerated flight testing, eliminate the causes for countless maintenance problems in the Fleet.

Equipment designed for Marine use, insofar as possible, is assigned to Marine pilots for testing. In carrying through an operational flight syllabus every piece of equipment on the plane, except rocket launchers, is placed in normal service use. Catapult and arrested landing gear enable the department to simulate all carrier operations. BUAER assigns advance base equipment, seaplane servicing floats, outdoor maintenance gear, and other special projects.

SERVICE TEST reports determine spare parts requirements and procurement policy for all new model airplanes. Without such usage data, naval aviation storage facilities for-

merly overflowed with unneeded parts while others could not be supplied in amounts adequate to meet requirements.

#### **Service Test Reports Aid In Solving Supply Problems**

Today service-tested aircraft go to the Fleet as known quantities, even from a maintenance standpoint. Defective materials and parts, revealed in the accelerated flight tests are replaced or redesigned to meet operational requirements. Aviation supply depots and carrier, CASU, and PATSU stockrooms are equipped in advance with those parts SERVICE TEST projects indicate will be needed. By eliminating procurement of unneeded aviation parts, the Navy saves space, labor and time. Percentages of airplanes in operational status in the Fleet is increased from the beginning.



SERVICE TEST HANGAR LIGHTS SILHOUETTE AN F7F WARMING UP ON THE APRON JUST PRIOR TO TAKE-OFF FOR A NIGHT FLIGHT

# TACTICAL

## Aviators, Engineering Specialists Team Up To Test Best Combat Uses Of Planes and Equipment

AIM OF all TACTICAL TEST projects is the scientific evaluation of Navy planes and aeronautical equipment to determine their most effective combat uses. Typical projects include radar evaluation, rocket firing, radar directed bombing, use of airborne cannon, dive bombing techniques and fighter tactics.

Assigned projects require reports not only for a specific plane, or equipment on that plane, but also for tactical evaluation of the complete unit. From 50 to 60 different tests, many under high priority, are underway at one time.



TACTICAL TEST TBF TRAILS SWATH OF DDT OVER A JUNGLE AREA

TACTICAL TEST works closely with cognizant BUAE desks and Fleet units to speed introduction of new tactics and equipment. While the department is in no sense a training activity, the unit in a number of cases has dispatched individual project officers to Fleet commands to indoctrinate personnel in use of new equipment or new tactics.

Tonys, Zekes, Focke-Wolfe 190's, Kates and other captured enemy planes, with Navy test pilots at the controls, are evaluated in actual flight competition with naval aircraft. Reports on these tests, together with detailed information on tactical weaknesses of individual enemy planes, go immediately to the Fleet.

### One Project Usually Leads Into Others

TACTICAL TEST determines faults as well as strong points of equipment and methods under trial. Many projects deal with modifications of equipment on accepted aircraft already in operational use. Each modification, even after

passing individual checks of engineering departments, must be closely examined from the standpoint of tactical value.

Modifications can result in important changes in the tactical uses of a particular plane or of the installations on it. A project assigned to evaluate a specific type of radar gear on a fighter may, and usually does, lead to many others.

Medical officers, also qualified as naval aviators, are on duty in the physiological test section to conduct projects in close collaboration with BUMED and the Naval Medical Research Institute. Effective aerial dispersal of DDT insecticide, developed at Patuxent and tried out by TACTICAL TEST project officers in the Canal Zone, now has service-wide acceptance.

### Camouflage Department Evaluates Concealment Tactics

Use of liquid oxygen in transport planes, where its economy of weight and space pays big dividends, is a current project at Patuxent. Medical aviators, using the Mathis constant sampling flask, fly combat planes through opera-



NAVY PILOTS PUT A JAP ZEKE THROUGH ALL COMBAT MANEUVERS

tional maneuvers to determine cockpit carbon-monoxide limitations of service type aircraft used in naval aviation.

The only unit in naval aviation that deals with visibility of aircraft, as a department section, evaluates tactics for concealment of planes in flight. BUAE assigns all camouflage projects to TACTICAL TEST where studies of enemy techniques and visibility data are assembled.

### Personnel Are Well Qualified to Appraise Equipment

The unit began in 1942 at NAS ANACOSTIA as the Aircraft Experimental and Development Squadron, authorized by CNO to examine those tactical methods that war experiences of our own and foreign forces indicated should be employed. The squadron moved to Patuxent in August 1943.

TACTICAL TEST pilots are veterans; six naval aviators now on duty commanded squadrons in operational theaters before they reported to Patuxent. Every pilot on duty in the department is qualified to evaluate planes and aviation equipment from the standpoint of his combat experience.



↑ Tokyo is the pay-off for these *Helldivers* winging over Jap territory in their first strike against Hirohito's homeland. Planes, ordnance and radar all were tactically evaluated at Patuxent

↓ *Hellcats* lend winged support to Marines by sweeping in low to release rockets and strafe Jap strongpoints on Iwo Jima. Equipment evaluated in Patuxent tests meets combat demands





THIS CLOUD FORMATION IS THE MAMMATO CUMULUS, FREQUENT FORERUNNER OF ONE OF FIERCEST OF ALL STORMS, THE TORNADO

# TORNADOES

**Bureau of Aeronautics Lists Precautionary Measures To Be Taken by Naval Air Stations as Season For Violent Storms Reaches Its Height**

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

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

The path of a tornado is usually about 1000 ft. wide and never more than a mile. By far the greatest destruction is caused within the vortex. Actual velocities are unmeasured, but it has been estimated that horizontal velocities increase rapidly toward the center from about 40 to 50 mph. around the edges to 200 to 500 mph. near the center. Vertical winds in the central part of

the vortex reach velocities estimated at 100 to 300 mph.

THERE ARE two types of tornadoes: 1. Conventional cold-front type caused by the interaction of cold polar air and warm tropical air masses, and 2. Precipitation-induced type which occurs in conjunction with cold fronts—caused by the interaction of a precipitation-cooled mass of air with a warm tropical air mass. Type 1, almost always assumes the characteristic funnel-shaped cloud, with a 2000 to 3000-ft. base, which ordinarily can be seen for great distances. This type usually occurs in groups or families, numbering from 2 or 3 to as many as 12 or 15 in connection with a single front. Type 2 forms on the base of very low clouds with a ceiling of 1000 ft. or less, and more than likely assumes some other shape than the typical funnel cloud. These twisters usually are experienced singly or occasionally in pairs. They are

the most dreaded for they may appear without any advance visual warning. For the U. S. as a whole, tornadoes are most frequent between 1500 and 1800 and least frequent between 0700 and 0800.

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

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

[SEE TN 11-43 & NANews, 4/15/44, pps. 29-31]

# What do you know about RADIO NAVIGATION AIDS?

It's NOT at all impossible to navigate a plane without radio aids, but at times it may be considerably difficult, as every naval aviator knows. Try these questions, then turn to page 48 to see if you have made a 4.0.

[QUESTIONS FROM BUAEER SPECIAL DEVICES VISUAL QUIZZER FILM NO. 56, RADIO AIDS TO NAVIGATION]



Write your answers here

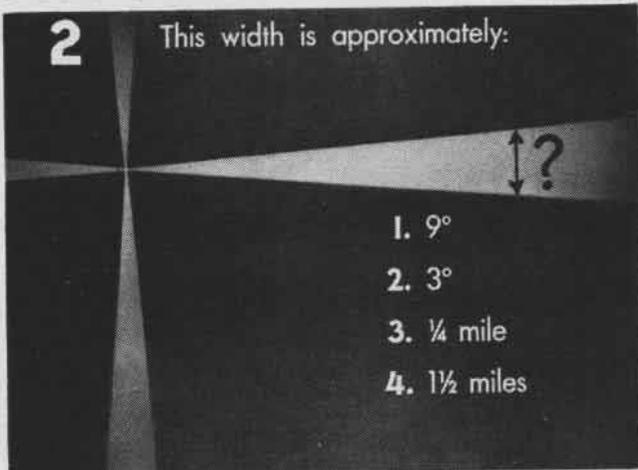
1. .... 3. .... 5. ....  
2. .... 4. .... 6. ....

**1** Minimum safe altitude for initial approach from West:



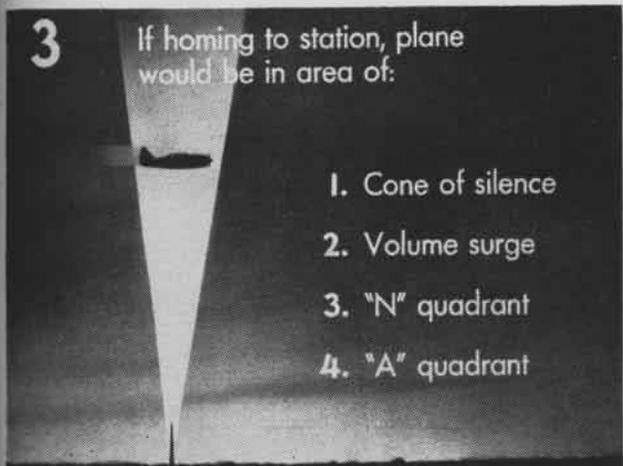
1. 9000 ft.
2. 5000 ft.
3. 3000 ft.
4. 15,000 ft.

**2** This width is approximately:



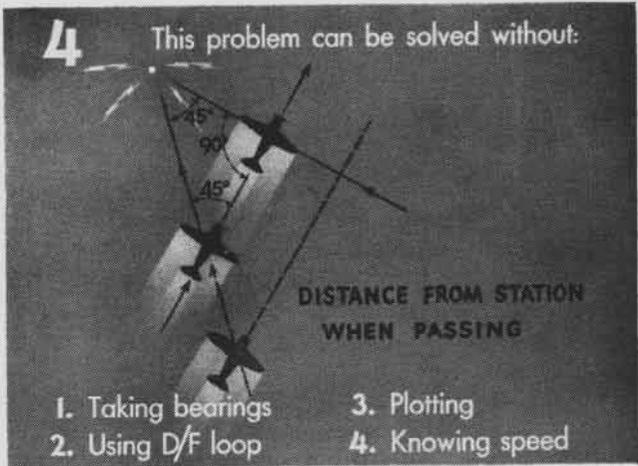
1. 9°
2. 3°
3. ¼ mile
4. 1½ miles

**3** If homing to station, plane would be in area of:



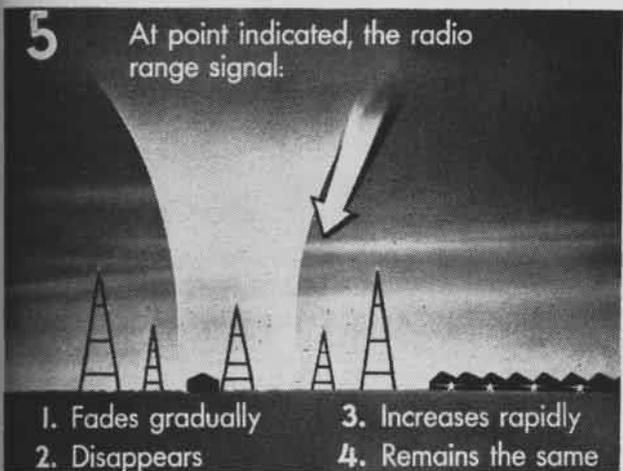
1. Cone of silence
2. Volume surge
3. "N" quadrant
4. "A" quadrant

**4** This problem can be solved without:



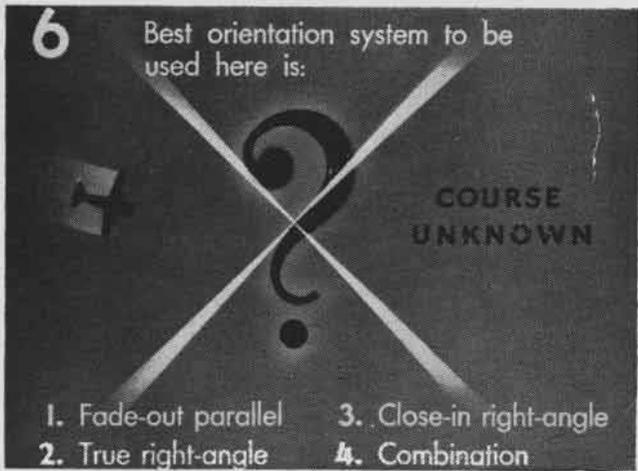
1. Taking bearings
2. Using D/F loop
3. Plotting
4. Knowing speed

**5** At point indicated, the radio range signal:



1. Fades gradually
2. Disappears
3. Increases rapidly
4. Remains the same

**6** Best orientation system to be used here is:



1. Fade-out parallel
2. True right-angle
3. Close-in right-angle
4. Combination

# CONVALESCENT SALVAGE WORK

**T**HREE hundred Navy and Marine Corps men recuperating from battle injuries or disease at Oakland Naval Hospital are doing valuable salvage work for the nearby air station at Alameda.

Both bed-ridden and ambulatory hospital patients are using their time to do many jobs that the station's A&R shop and other sections cannot find sufficient employes to handle. Work is done under the

hospital's convalescent rehabilitation program, which tries to give all patients something useful to do while there. Supervisors to direct the work come from the air station.

Men confined to their beds do lighter work, some of them sewing hooks on parachute straps. The elastic straps are stretched on special frames and hooks sewn on one end, then allowed to contract, securing the hooks to the strap. Hospital patients turned out as many as 500 of these straps a day for the air station's parachute section.

In a reconverted garage, men able to leave the wards are doing other work, such as cleaning and sorting spark sputers for aircraft engines.

They recently processed 105,000 plugs in a two-weeks period, with 100 men working on the assignment.

Special electrical plugs with built-in fuzes are repaired for use again. Patients remove the burned-out ones and install new fuzes. Other men clean and sort thousands of nuts and bolts used in planes while some disassemble and sort damaged radio and instrument control panels.

Having patients do this type of work accomplishes a triple purpose—it speeds recovery of the patient by giving him an interest in life, it helps keep him in better physical shape by being active, and last but not least, it gets work done for the air station assembly and repair shops.



BED-RIDDEN PATIENT AT OAKLAND HOSPITAL MAKES ELASTIC PARACHUTE STRAPS, CUTTING TO LENGTH, SEWING ON HOOKS



MEN ABLE TO LEAVE BEDS DO HEAVIER WORK FOR TWO-HOUR PERIODS; HERE THEY WORK ON TAIL WHEEL ASSEMBLY



CONVALESCENT PATIENTS CLEAN AND REPAIR CANNON PLUGS FOR ELECTRICAL INSTALLATIONS; EACH MAN HAS WORK TO DO

# TECHNICALLY SPEAKING

## NATS Takes Paint Off Planes

NAAS OAKLAND—When Naval Air Transport Service decided to strip camouflage paint off its R4D's and R5D's to decrease maintenance and improve operational efficiency, the paint shop of VR-4 turned in a rush job to make the change.

As many as 225 men were assigned to stripping at one time, taking the paint off the planes with NavAer C-141 paint remover. Since the job started in January 1944, the crews stripped about 150 transports. The fastest job was done on an R3D. It came on the



ELBOW GREASE AND REMOVER STRIP PAINT

line at 1800 and was ready to fly away at 1200 the next day, completely stripped, waxed and polished.

Without paint, transports will fly further on a given fuel load owing to weight reduction, and radio reception is improved through static reduction. Another advantage is that corrosion more readily is detected with paint removed.

The paint remover is applied with a brush, soaking the surface well; after a few minutes a fiber brush is dipped into water and the surface scrubbed, a little at a time. The last operation is to wax the surface to preserve it.

## BuAer Studies Oxygen Mask Wear

A CASU reports that the nosepiece wire of the Type 14 oxygen mask became exposed through its rubber covering after a short period of use. The reporting CASU suggests that a patch be applied over the nosepiece area.

Where additional replacement masks are available, this patching procedure is not recommended. If the situation requires remedial action where certain size masks may not be immediately available, a small patch may be applied over the arc of the nasal section. Rubber cement AN-C-54, rubberized fabric

and Navy aeronautical Spec. F-28, both available at local depots should be used for the repair.

Steps now are being taken by the manufacturer of Type 14 oxygen mask to fabric-wrap the imbedded nose wire in all future production.

BUAER is investigating means for protecting the oxygen mask. Oxygen mask retainer clamps—designed so that the mask when not in use may be positioned free from contact with other gear or clipped to flight gear in such a manner as to minimize frictional wear—are being developed. A quantity of experimental, lightweight, plastic mask containers are under procurement. This type container protects the mask from frictional contact and also shields it from excessive distortion.

Convenient fasteners will provide for either permanent or temporary attachment in multi-place aircraft. An oxygen duration and information card is incorporated into the design of these experimental containers. Mask containers are being specified and incorporated in new aircraft.

## Motor Generator or Arc Welder?

Reports indicate that some naval activities wish to reconvert Lincoln motor-generator set, type S-6063, S-6064, or SAE200-J, to 200-ampere arc welders.

These equipments were originally built as arc welders but were modified as motor-generator sets and procured in that form by BUAER to supply power for testing radio and radar gear. They should be used for that purpose and should not be diverted to use as arc welders.

If activities need arc welders, they should requisition them through channels normally associated with procurement of overhaul and shop equipment.

## Carriers Use Steering Device

NAS SAN DIEGO—A tail wheel yoke or steering device was developed at this station and has been in regular use here and aboard numerous carriers

operating out of this port for the past year. The device is attached to the tail wheel of the plane by inserting  $\frac{3}{4}$ " bolt through the hollow tail wheel hub. The projecting handle then is held by an individual who steers the tail of the plane.

Use of this device has greatly increased maneuverability of planes, and has made possible close, fast spotting. It is estimated that use of the improved tail wheel yoke has saved 50 man-hours on each aircraft carrier loaded.

This estimate is based on a reduction from 10 to 8 hours for the time



TAIL WHEEL YOKE SAVES HOURS AND MONEY

required to load 100 planes using a minimum of 25 men. Under actual practice, a considerably higher number are used. Therefore, the estimate of 50 man-hours or \$75 saved per carrier is conservative. This idea was submitted under the Navy Employees' Suggestion Program.

[DESIGNED BY JAMES A. PRALN]

## Rudder-Mounted Light Failures

Failures of rudder-mounted tail lights AN3091-2 on SB2C, SBF and SBW aircraft are reported to be caused by the loosening of the conduit connector nut, possibly by vibration, to such an extent that the terminal plug no longer makes contact with the lamp.

The following local action was taken by NAAS CECIL FIELD to overcome such failures. The rudder-mounted tail light socket assembly was removed and the conduit connector nut was tightened and then taped to the socket assembly and conduit with friction tape. Then three or more coats of glyptol were applied to the wrapped surface. Shellac may be used with equally satisfactory results.

BUAER is studying the problem to determine correctives, and action will be taken to improve the equipment.

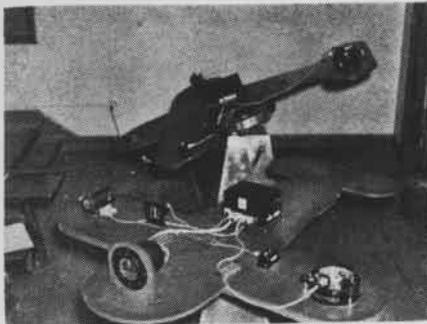


## NA TechTraCom

### NATTC Mock-up Aids Switch Instruction

Teaching students operation and maintenance of the airspeed flap control switch used on F6F's has been exceedingly difficult owing to inaccessibility of the unit.

R. W. McLeod, AMMI/c, instructor in the Instrument School at Naval Air Technical Training Center, solved the problem by constructing a mock-up as shown in the photograph. The compact layout of all the



UNIT EASES PROBLEM OF INACCESSIBILITY

units, properly wired and correctly operating, enables students to understand the principles of operation.

Proper trouble-shooting procedure also is taught with the aid of the mock-up.

### Charts and Diagrams Aid Instruction

Instructors in the Propeller School at NATECHTRACEN, 87th & Anthony, Chicago, are taking advantage of all the assistance that visual aids can give them. One example is the use of instructional charts and diagrams such as the one showing the electrical hook-up of a propeller reverse pitch control.

Diagrams showing the wiring installation on airplanes usually are too complex and too small to be of value in instructional work. Realizing this, Instructor J. R. Kelso, AMMP/c, developed a series of drawings that make things easy.

Instead of showing all the wiring of the airplane propeller circuits, these drawings show individual units, wherever possible, and their uses in the circuits.

In the case of teaching reverse pitch, and synchronizers, this method is extremely valuable as the student is not confused by non-essentials. After the function and operation of parts are understood, the individual units are combined in the master drawing, which gives the "whole picture" and also provides an excellent tool for review.

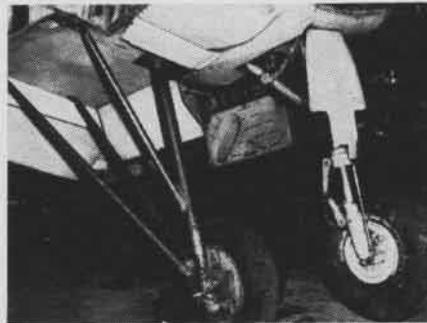
These drawings are usually 40" x 60", a standard card size, and all lines and lettering are heavy enough to be seen easily by a person sitting at the back of the room. Color is used only to emphasize units or to prevent possibility of confusion between parts of a unit.

In some cases it has been found of value to make photo enlargements of parts of propeller equipment to permit the student to see what the instructor is talking about. This is true whenever parts are too small.

### Surveyed Craft Yields Improved Jacks

Discarded shock struts and wheels from surveyed aircraft have been put to valuable use in the Hydraulic School, NATECHTRACEN, 87th & Anthony, Chicago.

For proper instruction on landing gear, tail wheel and arresting hook operation in the hydraulics course, hydraulic jacks had to be used to lift plane off the deck. This caused loss of time in setting up jacks and made it necessary to have numerous jacks on hand when instruction was given on more than one plane at the same time. To overcome these difficulties, permanent jacks were designed from obsolete struts and wheels.



NATTC JACK PERMITS PLANE TO BE MOVED

This type of jack presents the following advantages:

1. It enables the plane to become mobile. The plane can be used conveniently in the hangar or outdoors as the weather permits. Planes on standard jacks would create a problem in case of fire; however, a plane with mobile jacks can be moved to a safe area.
2. It eliminates use of extra space in stowing jacks.
3. It reduces to a minimum the number of standard jacks required.
4. It eliminates potential hazards that may occur to the plane or personnel when the plane is jacked up by standard jacks.
5. Planes that use this type of jack are not solely to be used to check out hydraulic mechanics, but can be used in checking out pilots on hydraulic gear.

The Hydraulic Department is incorporating this type of jack on SB2C, F6F, F4U and TBF planes. The jack was designed by Lt. (jg) G. J. Carr and constructed by J. J. Danculovich, AMMH/3c and J. J. Hitzel.

### Mate's Inventiveness Saves Navy \$750

John Swearingen, AMMI/c, of the Naval Air Technical Training Center, has developed six polishing heads for lapping pivots and races of Sperry instruments. The heads were constructed from salvaged materials.

Commercial-made precision polishing



SALVAGE PILE YIELDS POLISHING HEADS

heads cost roughly \$125 each, besides being difficult to procure. Through his efforts Swearingen has saved the Navy about \$750.

### Oxygen Cylinder Contamination

During a routine check flight a pilot showed symptoms that indicated his breathing oxygen supply was contaminated. Analysis showed contents of the plane's oxygen cylinder to be approximately 25 percent carbon dioxide.

Investigation revealed a quantity of aircraft cylinders had been contaminated during recharging operations by a few large oxygen storage cylinders that had been received from the Pacific area. Paint and markings on these cylinders indicated their intent for oxygen service and it was assumed they contained oxygen.

While it is not known how carbon dioxide got into the contaminated cylinders, it is believed they may have been used for carbon dioxide in an emergency when CO<sub>2</sub> cylinders were not available.

Except in cases of extreme emergency, oxygen cylinders shall be used only for oxygen. A cylinder used for CO<sub>2</sub> must be thoroughly marked to prevent it from returning to oxygen service without first being completely overhauled. Even then, recharging activities should double-check by examining residual gas in oxygen cylinders.

**Quick test for carbon dioxide:** Bubble gas through a three percent aqueous barium hydroxide solution or through a clear but saturated solution of calcium hydroxide. If carbon dioxide is present in the gas, a milky precipitate will form in about 15 seconds with barium hydroxide and in about one minute with calcium hydroxide.

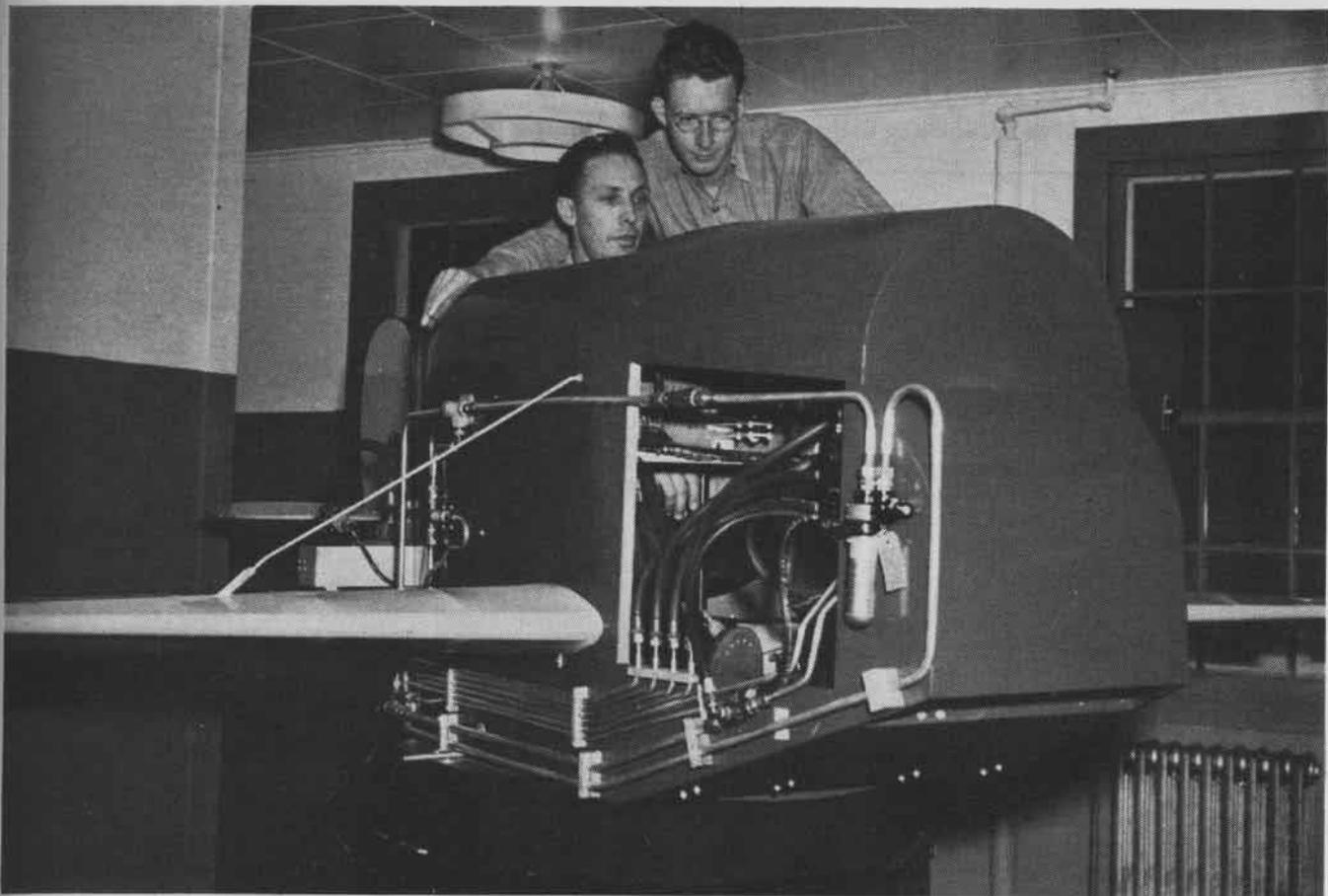
### AEMN Lists Answers For AEM's

Aviation electrical officers and aviation electrician's mates can find answers to many of their every day problems in *Airborne Electrical Maintenance Notes* (AEMN), a loose leaf publication kept up-to-date by monthly supplements, containing suggestions, explanations and orders on maintenance of airborne electrical equipment.

Any activity desiring to be on the mailing list for more or fewer AEMN monthly supplements should indicate number desired in a letter to BUAE, Publications Branch. Additional up-to-date sets of AEMN can be requested.

Subjects covered in the publication are of interest to personnel who maintain aircraft generators, batteries, voltage regulators, reverse current relays, motor-generator sets, motor alternators, auxiliary power units, motors, starters, electrical wiring and other electrical equipment.

The *Airborne Electrical Maintenance Notes* should be kept up-to-date and available for ready reference by all hands. Like other Navy publications, it goes to CO's of aviation activities.



INSTRUCTOR AT THE CONTROLS GIVES A TRAINEE THE WORD ON OPERATION OF A LINK TRAINER RIGGED UP WITH AN AUTO-PILOT

# AUTOMATIC PILOT SCHOOL

## Maintenance Trainees Practice On Link Trainers Rigged Out With All Types of Automatic Equipment

FACILITIES of the Navy's only complete automatic pilot (line maintenance) school now are available to qualified men at aviation activities afloat or ashore. Minimum requirement for entrance to the school, located at NATTC JACKSONVILLE, is a rate of aviation electrician's mate third-class or its equivalent.

A class of 20, including some class "A" AEM school graduates, enters automatic pilot training each week. On successful completion of training, fleet men return to their units. BUPERS assigns others to aviation activities.

Each training step gives students a practical understanding and appreciation of problems involved in line maintenance of automatic pilot equipment. Mockups, charts, cutaways, and training films are employed to the fullest extent. All instructors have service or civilian backgrounds in the work.

Basic courses in electricity, electronics, and hydraulics are given. During the 10-week course all men learn to operate and maintain these pieces of equipment: Sperry S-A and S-4 and Jack and Heintz J-1 pneumatic-hydraulic pilots; General Electric mechanical proportional bank adapter and G-1 electric-hydraulic pilot; SBAE Mk. 2 Min-

neapolis-Honeywell electric pilot; Pioneer electrical Gyro Flux Gate compass; Pioneer Air Position Indicator; Sperry electrical attitude Gyro; and Pioneer (P-1) electrical-electronic pilot.

Forty Link trainers, rigged with automatic pilot equipment, give trainees an opportunity actually to operate gear they will later maintain in service type aircraft. Each student must find and correct malfunctions set up by instructors in automatic equipment on the Link trainers. Every student spends more than 40 hours operating and maintaining the specially rigged Links. Graduates are thoroughly indoctrinated in proper ground checking and engaging procedure for automatic pilots.

Because men assigned automatic pilot maintenance duties must be familiar with an aviator's problems, each trainee will receive approximately 25 hours flight time in SNB's, JRF's and TBM's. During flight, trainees will study operating procedures and functioning of automatic pilot gear.

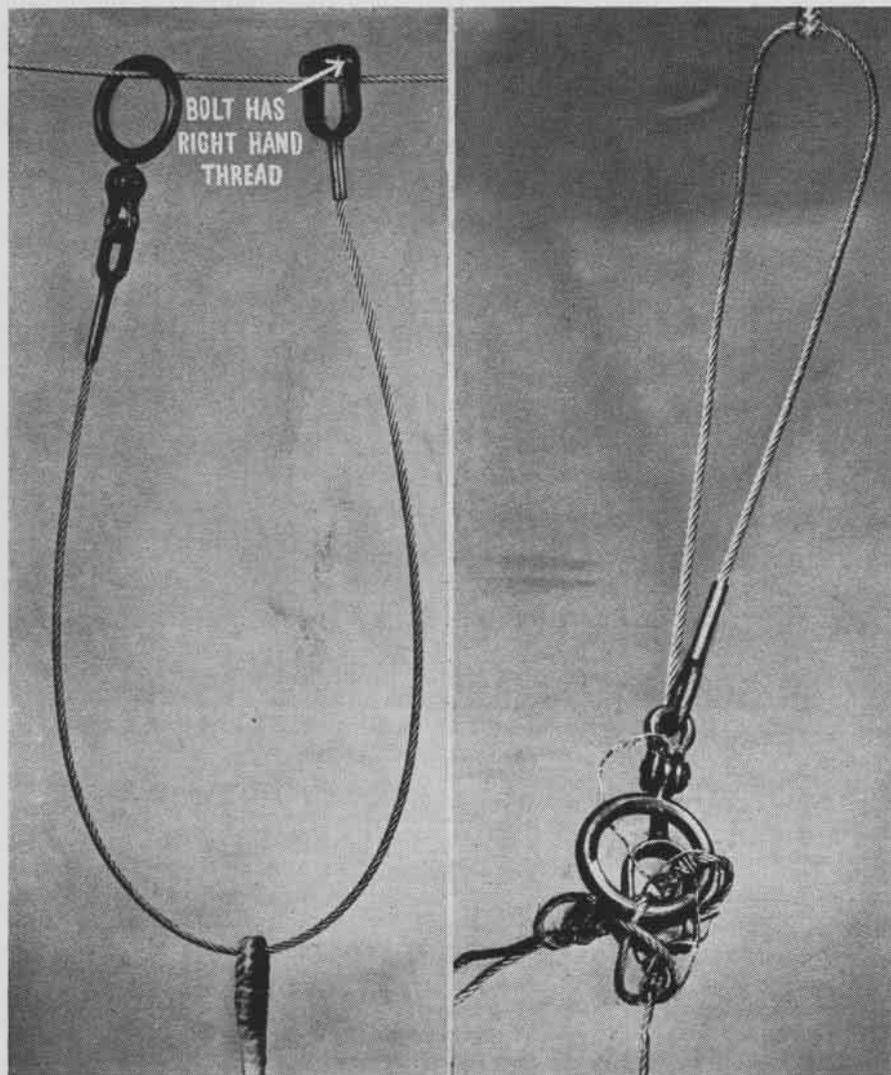
In addition to the regular full-length course, the Naval Air Technical Training Center school provides special training on individual automatic pilots. Personnel assigned for work on a particular type of automatic equipment report for two or three weeks of training.



TRAINEES STUDY AN AUTO-PILOT MOCKUP

# AVIATION ORDNANCE

INQUIRIES SHOULD BE ADDRESSED TO THE CHIEF OF BUREAU OF ORDNANCE



TARGET STREAMS FROM BIGHT OF LEADER; SNARL CATCHER HANGS ON SNARLED CABLE

## Snarl Catchers Speed Target Practice

In the past, aircraft and antiaircraft gunnery practices often have been delayed or terminated entirely after a sleeve target has been shot away, owing to the lengthy time required to reel in the remaining cable, attach a new release and stream another target. This operation usually required between 20 and 30 minutes and sometimes could not be done at all because of a reel breakdown. As a result, towing squadrons have been forced to use two or three tow planes in order to insure success of important towing missions at sea.

Utility squadrons in the Pacific have been experimenting for some time with various devices known as "snarl catchers," which, when streamed on the cable, will catch in the snarl formed at the free end of the cable. The snarl is caused by the sudden release of tension on the cable when a target and release are shot away.

vj-13 has devised an ingenious snarl catcher that has an advantage over others

in that it requires nothing more than the standard Target Leader Mark 1 and the Target Release Ring Mk 7 Mod 1, with no modifications of these items required.

Before a towing mission, the leaders and release rings are strung on the cable outrigger of the tow plane in the usual manner. If a release is being used, these leaders and rings can be used in the ordinary way for exchanging targets. If the release is shot away, the next leader to be sent down the cable is converted into a snarl catcher by passing the yoke or free end of the leader through the eye of the target bridle, removing the bolt and spacer from the yoke, placing the yoke over the cable and replacing the bolt and spacer.

The bolt must be placed into the yoke in such a way that travel down the cable will tend to tighten rather than unscrew the bolt in the yoke. When the target and leader are rigged this way, the target will stream from the sight of the doubled leader instead of from the yoke, as in ordinary

towing methods for such target practice.

When the snarl catcher and target reach the snarl at the end of the cable, the yoke catches and the release ring following rides over it and jams securely enough to hold against the drag of the inflated target. A cable-cutting messenger is used to release the target and snarl catcher, and the whole operation can be repeated for subsequent targets.

Operating activities have reported that this snarl catcher is 90 percent effective. If a snarl catcher with target attached fails to hold and slides off end of cable, the cable end can be whipped into a greater snarl by a few sharp turns of the tow plane. Another snarl catcher and target sent down the cable then should hold securely.

## Cold Troubles Ordnanceman

A disadvantage of this rig is the fact that the ordnanceman must unscrew the bolt of the yoke, place it on the cable, fit the spacer in place and screw the bolt back in—all this being done with his hands outside the plane. This becomes difficult in cold weather, and the danger of frozen fingers must be considered. Bureau of Ordnance is investigating means of quickly attaching the free end of the leader to the cable to eliminate this disadvantage.

ComAirPac has approved a similar snarl catcher in which no release ring is used. The leader runs down the cable with the shackle (reversed in the leader eye) and yoke of the leader attached to the cable. This requires case-hardening or stellite-welding of the shackle to prevent its wearing through during travel along the cable.

A shackle guide is welded on the eye of the leader to prevent the shackle from doubling over on the eye, causing the snarl catcher to bind on clear cable. With this method no targets are exchanged by means of releases. All exchanges are done with cable-cutting messengers and snarl catchers.

The snarl catchers described here are only two of many. Various towing activities have their own favorite rigs, but almost all are based on use of the doubled leader.

## Your RUDAOE's Help Correct Defects

One RUDAOE states that upon unpacking Mirror Assembly for Gunsight, Mk 18, from shipping box, fixed mirror came loose from mirror holder and dropped into case. Examination showed lack of cement holding mirror. **Results:** Corrective action has been taken by BUORD, and new production sights will be changed so that the fixed mirror will be mounted securely.

Bureau of Ordnance appreciates receipt of information of the type contained in these "Reports of Unsatisfactory or Defective Aviation Ordnance Equipment." It is through such reports that defects of equipment in operation can be studied.

## Correction

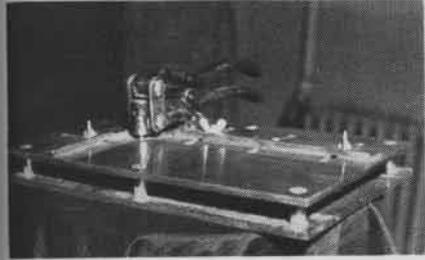
Last paragraph in article on "Replacement for Bomb Shackle, Mark 4" (Bomb Shackle Mark 8 Mod 0) on Aviation Ordnance page in April 15 issue of NAVAL AVIATION NEWS should be corrected to read as follows:

"No lubrication or preservative is required for the Bomb Shackle Releases or release mounts. Rough *handling* should be avoided." Make this change accordingly.

## Trenton Develops Punch Table

NAF TRENTON—A handy portable punch table has been developed in the metal shop at this activity by adapting a special base to a standard hand punch. It can be used in any utility shop on small quantities of work requiring duplicate punching.

A hand punch with dies ranging from 3/32" to 1/4" in 32nds was mounted



CUTTINGS FALL OUT THROUGH THE TABLE

on an 8" by 12" base plate by drilling through the plate into the punch frame, tapping the frame, and countersinking the bottom of the plate to accommodate a 1/4" or 3/8" screw.

A cut-out in the table plate recesses the punch to its female die level. Slots and slide-stops with wingnut fastenings are arranged to operate at 90° to each other with the punching center as a vertex. Graduations in 1/16" to the depth of the punch jaws, permit easy settings and a check against any variation of the setting during operation.

Base plate and table plate are separated by tube spacers at least 1 1/2" long to provide ample room for punchings to fall away from the bottom of the punch. A hole 1" in diameter, drilled through the base plate directly under the female die, will permit easy access to the bottom of the punch so that dies can be changed.

[DEVELOPED BY W. G. EWING, AMIC]

**BuAer Comment**—The portable punch table is practical and will serve a useful purpose in picking up centers on alike pieces. The design involves an old principle in BuAer, but this adaptation will be a time-saver and will increase efficiency.

The tool will have its greatest value to land and ship-based squadrons, CASU's and Naval Air Facilities wherein mechanical equipment is limited. Most A&R shops have mechanical equipment for production work of this kind. However, the punch would be useful to them for work on small quantities wherein it would not be practical to set up production gear.

## Squadrons

LET NANews  
HEAR  
FROM YOU!



# SCREEN NEWS

**T. N. T. Untouchables.** Whether the hazard is a buried anti-personnel mine, an unexploded bomb or a dud shell, something has to be done about getting the stuff out of harm's way. You just can't let those things lie around loose for somebody to happen on or for kids to play with after the war. A new motion picture dramatizes the danger of possum-playing munitions and shows how to deal with these hair-trigger-tempered prima donnas.

MN-5007 *Reporting Unexploded Munitions* (Restricted, 19 min.)

The film tells who should take 'em and who should leave 'em alone. Disarming hot "packages" is a job for Bomb Dis-



MARINE EXTRACTS TEETH FROM JAP MINE

posal Unit experts with no nerves and plenty of knowhow. Amateurs are strictly verboten.

Although most of the film watches Bomb Disposal personnel at work on various types of "dead" explosives, fair warning is also given to (1) long-odds gamblers (2) men with more curiosity than will power, and (3) the type of guy who used to let cannon crackers go off in his hand on the 4th of July. All such chance-takers are cautioned to let sleeping duds lie, mark off the space around them, and report the damn things to the C. O.

**Combat Flashes.** The new World Series of fighting films which opened in March with MN-9034a *U. S. Navy Combat Bulletin No. 1* (Restricted, 18 minutes) is a monthly edition of Navy, Marine, Coast Guard and Army combat footage taken from all the fighting fronts.

No. 1 of the series shows: Marines bombing Formosa; capture of Nazi weath-ermen in the Arctic; ice on the Western front; whole blood from home front Americans to the wounded in Leyte; U. S. buzz bombs for German home consumption.

No. 2 (April issue, Restricted, 20 minutes) covers: Yanks attacking Cavite Naval Base near Manila—smashing planes, ships, hangars, fuel dumps and anything else they could get their gunsights on; a strip of captured enemy propaganda film featuring "devilish Yankee gangster-pilots murdering innocent victims" and "blood-thirsty British-American barbarians" destroying Asiatic homelands; Filipinos

welcoming the Americans with riotous demonstrations of good will; heavy infantry fighting around Clark Field; the freeing of Manila and liberation of prisoners after three years of Jap control; capture of Corregidor, with shots of preliminary softening up; paratroopers dropping on the two air-fields and amphibs moving in on the heels of heavy bombardment from the roaring throats of offshore 16-inchers.

Subsequent issues will follow each month, with every effort being made to get this combat material out quickly to all activities, for showing to all hands.

### Other Films Being Shipped:

- MN-4382a *Airborne Forward Firing Rockets—Carrier Loading and Stowage of Rockets* (Confidential, 22 min.)  
 MA-5296 *GCA (Ground Controlled Approach)* Confidential, 32 min.  
 MA-5155 *Incendiary Attack on Jap Cities* Confidential, 18 min.  
 MA-5154b *Improvised Fuel Drum Incendiaries* (Confidential, 8 min.)  
 MN-9036 *How Dangerous Is That Drop Tank* Confidential, 13 min.

Series of sound slide films (with records) on The Curtiss Electric Propeller—4 Blade Twin Engine Installation, subtitles as follows:

- SC-5414a *Operation* Unclassified, 105 frames, 16 min.  
 SC-5414b *Installation* Unclassified, 139 frames, 36 min.  
 SC-5414c *Field Inspection and Maintenance* Unclassified, 129 frames, 16 min.  
 SC-5414d *Trouble Shooting* Unclassified, 96 frames, 21 min.

Series of sound slide films (with records) on The Curtiss Electric Propeller—3 Blade Aluminum Alloy Propeller—Single Engine Installation, subtitles as follows:

- SC-5415a *Operation* Unclassified, 82 frames, 13 min.  
 SC-5415b *Installation* Unclassified, 136 frames, 26 min.  
 SC-5415c *Field Inspection and Maintenance* Unclassified, 102 frames, 18 min.  
 SC-5415d *Trouble Shooting* Unclassified, 88 frames, 19 min.

**Where to Get 'Em:** Central Aviation Film Libraries and Sub-Libraries are located at:

- |                      |                     |
|----------------------|---------------------|
| Naval                |                     |
| ABATU, NAS St. Louis | NAS Quonset         |
| CASUs 2, 4, 23, 24,  | NAS San Diego       |
| 31, 32               | NAS Squantum        |
| CASU ComDet., Port   | NAS Willow Grove    |
| Hueneme              | NAS Navy #115       |
| ComAirPac            | NAS Navy #117       |
| FAW 15               | NAS Navy #720       |
| Hedrons 2, 4, 7,     | NATB Pensacola      |
| 12, 16 Det., 17      | NATB Corpus Christi |
| NAB Seattle          | NATEC Lakehurst     |
| NAB Navy #939        | Navy #3233          |
| NAC Navy #140        | TAL Navy #116       |
| NAC Navy #3205       | Marine              |
| NAMC Philadelphia    | MarFairWestCoast    |
| NAOTC Jacksonville   | MCAD Miramar        |
| NAS Alameda          | MCAF Newport        |
| NAS Atlanta          | MCAS Cherry Point   |
| NAS Brunswick        | MCAS Eagle Mt. Lake |
| NAS Clinton          | MCAS El Centro      |
| NAS Kodiak           | MCAS El Toro        |
| NAS Moffett          | MCAS Mojave         |
| NAS New York         | MCAS Navy #61       |
| NAS Norfolk          | MCAS Parris Island  |
| NAS Patuxent         | MCAS Santa Barbara  |

Check your nearest library before ordering

# PHOTOGRAPHY

## Recon Photo Titles Show Discrepancy

Aerial negatives and prints received by CinCPac-CinCPoa from photographic reconnaissance units frequently show evidence of negligence or carelessness on the part of operating personnel which, if corrected, will greatly expedite handling, reproduction and distribution by intermediate receiving agencies.

All units producing aerial photographs should follow the procedure for titling aerial negatives as set forth in NAVAER 10-1R-53, Photography Technical Bulletin, 25 March 1944. If titles are hand-lettered, numerals for the designation of the month should not be used. The first three letters of the month should always be used, abbreviated as follows: MAR 25-45. This information is not intended as a directive to use hand lettering instead of a stamping machine where the latter is now being used successfully.

Most common discrepancies occurring recently in titling are as follows:

1. In a number of instances the negative has not been titled which has caused loss of time in determining location of the photography and titling of the negatives.

2. Duplicate negatives have been received printed with the emulsion reversed which causes confusion between starboard and port split verticals and a great deal of waste printing.

3. The same number is often used for several flight lines, making it necessary to order photographs of several flight lines when only one is needed.

4. In many cases, one or more of the following items have been omitted from the title strip: Negative number, run number, carrier number, sortie number, date, focal length, angle of camera, time and zone, altitude and location.

5. The title strip has not been placed at both ends of each roll making it necessary to unspool roll to read title strip.

6. Individual exposures are not numbered which makes it impossible to order individual prints.

It is imperative that all photographic activities be impressed with the necessity of accurately titling all aerial reconnaissance photographs. It is also stressed that the title must include the time that the photographs were made. This has not been done in a number of recent instances which has considerably lessened the value of the photographs.

## Taking Wax Off Rolls Of Smith Dryers

Certain units have complained that aerial film dried on the Smith dryers often pick up a deposit of wax from the wooden rollers of the dryer. This fault can be overcome by boiling the rollers in water in order to remove the wax.

## Mailing List For Technical Bulletins

To insure rapid delivery of photographic publications to the photographic laboratories all addresses have been altered to read as follows: Attn: Photographic Officer.

## Signaling Kits Go On Mae Wests

Personnel attached to NAOTC JACKSONVILLE when scheduled for overwater flights are issued Mae Wests equipped with the following signaling devices, secured to or between the folds of the jacket:

1. Two standard dye markers in individual waterproof packets
2. Waterproof flashlight
3. Smoke signal
4. Whistle

The devices as attached to the wearer are readily accessible; they are made for repeated use (except the smoke bomb), thus giving the survivor more than the one "golden opportunity" to attract attention, and are suitable for day, night, or conditions of poor visibility.

These especially equipped Mae Wests were made up by NAOTC in an effort to promote safety and survival among all flying personnel attached to that command who are engaged in flight training. The effort has paid off handsomely in the number of flying personnel rescued from the ocean after ditching or bailing out.

Wearing of these especially equipped Mae Wests is required at NAOTC on all overwater flights. All of the parachute and equipment storerooms at all of the air stations and fields under NAOTC have been supplied with the modified Mae Wests. When pilots draw their gear, they are asked "Overwater flight?" If the answer is yes, the especially-equipped Mae Wests are issued.

To round out the signaling equipment available, it is advisable also to carry a mirror in the flight clothing.

[SEE "NIGHT DISTRESS SIGNALS" IN MARCH 1, 1945 NANews]

## Switch Guards Are Now Available

Generator switches on single-engine airplanes should be kept on at all times except during checks of the electrical system or in emergency conditions involving abnormal operations such as over-voltage, short circuits or engine fires.

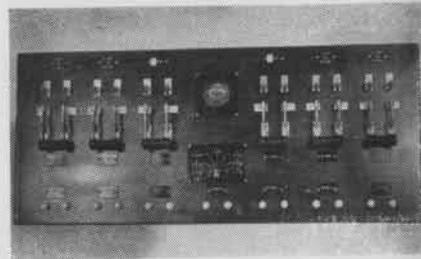
Tech. Note NO 17-45 contains instructions for the installation of a cover guard on the generator switch. This guard can be obtained from local stock under NO. R17-G-10177-25 and installed in about one-half hour. It is recommended that all activities install the guard on single-engine planes not already equipped with generator field switch cover guards. The guard is red and unlabelled, the switch is off, the guard stands out in an abnormal position and is readily noticeable. If guard conceals switch designation, the switch should be properly reidentified on the panel.

In most installations, in order to have the guard hinge at the top or

away from the pilot, it will be necessary to remove switch from panel and turn around 180° so "on" position of toggle is down if vertically mounted or toward pilot if horizontally mounted.

## Board Speeds Battery Recharging

NAS PATUXENT RIVER—A switchboard that permits paralleling of four Tungar rectifiers has materially increased battery charging facilities at this station's RADIO TEST electrical department. The switchboard is designed to make possible the charging at any one time any of the following battery hook-ups: four banks of batteries at



BOARD UPS BATTERY CHARGING FACILITIES

0-6 amps.; two banks at 6-12 amps.; one bank at 12-24 amps. Any number of batteries of any voltage can be connected in series in each bank so long as the total voltage does not exceed 72 volts.

A full charge of 24 amps. may be obtained at terminal "D" by having all switches in the "up" position. A charge of 12 amps. may be obtained at terminals "C" and "E" by having switches "A", "B", "F" and "G" in the "up" position and switches "C" and "E" in the down position. A charge of 6 amps. may be used individually at terminals "A", "B", "F" and "G" by placing switches "A", "B", "F" and "G" in the down position.

The board is made with 3/4" bakelite and has six D.P.D.T. switches, an ammeter with a scale of 0-30 amps., 0-15 amps., and 0-7.5 amps., is mounted at top center of board. A selector switch is mounted below the ammeter. Each rectifier is fused with an 8 amp. fuse to protect the shunts in case of a short while putting batteries on charge. The ammeter is fused with 1/2 amp.

The board is designed for use with the General Electric Tungar Chargers, Model 6RB655. The meter, selector switch and shunts can be salvaged or drawn from supply at any naval aviation unit. Plans for the switchboard are available on request from the station.

► *BuAer Comment*—This is very similar to setups used at a number of battery shops on naval air stations. This idea may be helpful to other stations in improving their aircraft battery handling facilities.

# INTEGRATED AERONAUTIC PROGRAM

## Program Requires Full Reports

REVELATION that many of the men responsible for reporting on planes in their custody have not sent in full information has again centered attention on the essentiality of timely and accurate reporting, upon which depends, to a large extent, intelligent planning for the Integrated Aeronautic Program.

The job of correlating information from various sources so as to look ahead to Naval Aviation's requirements is primarily that of OP-31, Planning Division of DCNO(AIR). This division, working in cooperation with BUAER and related agencies, publishes eight basic planning documents which bear heavily on functioning of the Integrated Aeronautic Program, and which are, to a great extent, dependent on the best information from the field as well as on experience and intelligent planning. An understanding of these publications leads to an appreciation of the role that the Planning Division, using information submitted to it, plays in successful operation of the IAP.

### Schedule Lists Varied Aviation Units

*The Schedule of the Naval Aeronautic Organization*, issued each month by OP-31, sets up the program of the organization and the scheduled development of that program. It details exact ships, squadrons, and shore establish-

ments constituting Naval Aviation, shows which are presently in commission, and dates of future commissionings or de-commissionings, and sets forth the aircraft complement for each.

*Planning Releases*, issued by DCNO(AIR) with approval of the Assistant SecNav for Air, furnish data for the Schedule; these affect changes in the Program, such as revisions in complements of carrier air groups or patrol squadrons or changes in complements of shore establishments.

### Publications Reveal Plane Production

*The Summary of Logistic Requirements*, one of the most important of these basic documents, is the working guide for the procurement and distribution of aircraft to equip the organization established in the Schedule. Basing its summary on the latest deployment of aircraft as reported in Forms 1872 and 1873A and B, it is used by everybody in Naval Aviation: by ASO for procurement of parts, by BUAER Production for acquisition of new planes, by BUAER Maintenance for reconditioning of planes, by Planning Division for assignment of planes to different commands, and by other groups. Like several other of the basic documents, it originates in planning division of DCNO(AIR).

Two documents keep the aeronautic organization informed on latest available estimates of future deliveries of

new and reconditioned aircraft, and thus are the basis of all such estimates. They show how well the production of aircraft is geared to the required flow. For new airplanes, this document is *USN Aircraft Delivery Estimate*, a joint monthly publication of BUAER and CNO; for reconditioned planes it is the *Estimate of A & R Output*.

Each month an estimate for the ensuing six months of the probable assignment of aircraft is made in two documents; estimates for new planes in *Tentative Assignment Navy A/C*, and for reconditioned planes in *Tentative Assignment of Reconditioned A/C*. That is to say, these two documents indicate probable assignment of the planes which are detailed in *Aircraft Delivery and Estimate of A & R Output*.

### Book Tells Number of Planes, Personnel

A monthly report issued by OP-31-B (program planning section) is *The Summary of Objectives*, a chart book comparing graphically the requirements and availabilities of aircraft and aviation personnel. Aircraft are set forth in summary totals and prototypes; numbers of ships, squadrons, and airgroups on hand and scheduled to be on hand at future quarterly dates are also set forth.

These documents further the intelligent operation of the Integrated Aeronautic Program, and proper reporting from the field helps to further the soundness of these basic aviation documents.



Allocations of new aircraft such as this new F7F type are made from planning program which draws on reports filed under IAP



Procurement of repair parts for naval aircraft by aviation supply offices is based on summaries of reports sent in from the field

## PUBLICATIONS

The following Flight Safety Bulletins, Aviation Circular Letters, Technical Notes and Technical Orders have been issued since 1 March 1945. Copies are available on request to Publications Branch, Bureau of Aeronautics.



### FLIGHT SAFETY BULLETINS

- 5-45 Multi-Engine Airplanes—Procedure During Fire in Flight.
- 6-45 Pilot-Caused Engine Troubles.
- 7-45 Precipitation Static.



### AVIATION CIRCULAR LETTERS

- 7-45 Daily Control Tower Operations Log NavAer Form 2077A, and Monthly Runway Traffic Report NavAer Form 2077B.
- 23-45 Unit Histories and Quarterly Historical Reports: Submission of.
- 24-45 Overhaul Facilities for Water Injection Equipment (Combat Power) Designation of.
- 25-45 Overhaul Facilities for Regulators (Hydraulic and Electronic) for Exhaust Gas Driven Superchargers—Designation of. (Joint Liv.) Aircraft Structural Change Material—Allocation, Distribution, and Disposition of.
- 27-45 Reconditioning and Repair Facilities for Pneumatic Life Rafts—Designation of.
- 28-45 Special Propeller Maintenance Tools—Policy Governing Distribution of.
- 29-45 Airplanes to be Ferried to Reconditioning Activities—Minimum Operating Qualifications—Establishment of.
- 30-45 Hamilton Standard and Curtiss Electric Propellers—Overhaul Periods for.



### TECHNICAL NOTES

- 17-45 Generator Switches for Single-Engine Airplanes—Instructions in use of—Addition of Guard.
- 18-45 Eclipse 800-1 Airborne Motor-Alternators, Application Notes on.
- 19-45 Carbon Monoxide Indicator—Bulb Type Colorimetric.
- 20-45 Models AN/APX-1 and AN/APX-2 Aircraft IFF Equipment, Rear Destructors, Removal of.
- 21-45 Care and Preservation of Parachutes in Warm Humid Climates Conducive to Fungus Growth.
- 22-45 AN/APX-1 and AN/APX-2 IFF Mark 3 Equipment Antenna Insulator Failures.



### TECHNICAL ORDERS

- 23-45 Fuel Pressures, Engine Driven Fuel Pumps.
- 24-45 Parachute Kit, Model PK-1 and Supplementary Air-Sea Rescue Items of Personal Equipment—Description, Inspection and Maintenance.
- 25-45 Life Vests—Inspection and Maintenance of.
- 26-45 Model TD2C-1 Airplanes—Restrictions and Permissible Maneuvers.
- 27-45 Model R5D-2, -3 Airplanes—Restrictions and Permissible Maneuvers.
- 28-45 Model PBM-3, -5 Airplanes—Restrictions and Permissible Maneuvers.
- 29-45 Model PV-1 Airplanes—Restrictions and Permissible Maneuvers.
- 30-45 Life Vests Specification AN-V-18—Use of.
- 31-45 Non-Sealing or Bladder Type Fuel Cells—Handling and Maintenance of.
- 32-45 New Anti-Friction Bearings—Lubrication Before Installation of.
- 33-45 Aircraft Engine Fuels—Use and Disposition.



PLEXIGLAS CHIPPAGE NOW IS ELIMINATED

### Mounted Point Aids In Drilling

NAMC PHILADELPHIA. Drilling operations on plexiglas turrets have been greatly improved with introduction of a new method that utilizes a mounted

point for performing the final drilling operation.

Formerly, after the holes were marked, drilling was started by using a No. 21 drill, etc., until the hole was increased to 9/32" diameter, so that the 1/4" barrel nut had plenty of room. This use of graduated drills was necessary to prevent taking a sharp "bite" in the glass. When the precaution of using graduated drills was not taken, the result was that the glass cracked and spoiled. This graduated drilling process was slow and costly.

The new method consists of first drilling with a No. 30 drill and immediately following this with a 9/32" mounted point. This tool, which may be compared in effect to a series of tools, cuts the glass quickly and produces a smooth surface in the hole. Friction of the rotating mounted point creates head and softens the composition of the glass to facilitate the drilling operation. This was a suggestion submitted under the Navy Employees' Suggestion Program.

[DESIGNED BY ADOLPH SCHERER]

Succeeds List of 1 March 1945

1 April 1945

### LIST OF NUMBER AND DATE OF LATEST ISSUE OF AIRCRAFT SERVICE CHANGES AND BULLETINS

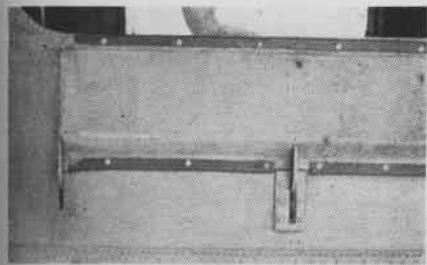
Airplane	Bulletin	Date	Change	Date
F6F	101	2-22-45	85	12-18-44
FM	41	3-5-45	57	2-28-45
F4U-F3A-FG	176	3-19-45	208	1-22-45
F7F	8	3-20-45	7	3-20-45
F4U-4	4	3-15-45	1	12-9-44
GB	15	1-1-45	14	3-24-45
GH-NH	10	3-14-45	0	—
HNS	1	11-15-44	5	1-22-45
J2F	18	1-1-45	9	1-23-45
JM	35	3-23-45	43	3-1-45
JRB-SNB	30	3-12-45	27	3-20-45
JRC	6	2-10-45	5	7-19-44
N2S	28	2-26-45	38	9-18-44
OS2U-OS2N	65	1-18-45	75	2-1-45
PB2B	9	2-7-45	3	6-22-44
PV	113	3-28-45	158	2-7-45
PBJ	50	2-23-45	66	2-23-45
PBM	98	3-22-45	159	3-16-45
PBY	101	3-19-45	174	2-26-45
PB2Y	59	3-15-45	153	1-3-45
PB4Y	131	3-24-45	139	3-5-45
R5C	26	3-24-45	88	12-22-44
R4D	38	3-5-45	35	3-9-45
R5D	48	3-12-45	99	3-24-45
RY	49	3-20-45	26	2-26-45
SBF-1	60	1-19-45	63	3-2-45
SBF-3	48	3-21-45	28	2-28-45
SBF-4	6	2-2-45	1	1-31-45
SBW-1	57	12-4-44	74	2-17-45
SBW-3	64	1-30-45	66	2-17-45
SB2C-SBF-SBW	153	3-12-45	132	2-26-45
SC	35	3-15-45	18	3-10-45
SNJ	33	3-17-45	27	1-13-45
TBF-TBM	165	3-23-45	228	3-14-45
TBY	3	3-12-45	0	—
TD2C	0	—	1	12-4-44

For complete list of Aircraft Service Changes and Bulletins, see Naval Aeronautic Publications Index NavAer 00-500 and Supplements NavAer 00-500B.

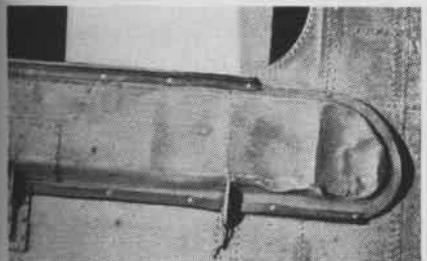
## VPB-16 Remedies Spoiler Damage

VPB-16—While operating in a 100 percent tender-based status, this squadron's PBM-3D's suffered damage from boats coming alongside several times a day.

Smashing of the lower nine inches of the waist hatch spoilers was the most common damage sustained. Damage



BOATS CAUSE WAIST HATCH SPOILER DAMAGE



SPOILERS ARE CUT OFF BELOW BOTTOM HINGES

was repaired by cutting off the portion of the spoiler below the bottom hinge. This not only repaired the original damage but raised the spoiler above the normal height of the boats' gunwales so that in smooth water boats are below the spoiler.

Boats striking lower prop blades of the PBM-3D's also caused some difficulty. A great deal of the trouble has been eliminated by turning the four-bladed props so blades are at an angle of 45° to the wing. The lower blade tips, with this propeller setting, are raised about eight inches higher above the water. In many cases eight inches is the additional clearance required for a boat to pass safely under a propeller while clearing the plane.

## Survival Equipment Aids Rescue

VT-17—While giving air support to a recent landing, a TBM-3 of this squadron was hit by enemy AA. The plane was struck soon after the bomb-bay doors were opened, but prior to release of bombs. The pilot reported:

Our control cable was knocked out, rendering the stick useless. We released our bombs over target and prepared for water landing. The elevator tab control was functioning and engine running smoothly. With this control and because of being over Japanese territory, I decided to attempt water landing near a DD.

My crewmen were both in center cockpit. The center cockpit is the regular ditching station for the radioman, but be-

cause the gunner was not able to get the emergency hatch out of the turret, he joined the radioman. The reason for the turret hatch difficulty was that the safety wire was too strong and could not be broken. This should be checked in all TBM airplanes.

The landing was successful with only minor injuries sustained. We had our three-man life raft out and inflated before the plane sank. We made the landing into the wind, flaps down, wheels up and power on. Our safety equipment in the plane was in excellent condition. The raft was well packed and heavily powdered and slipped out of its container with minimum of effort.

The lines thrown to the raft by the rescue ship should always be secured to the life raft. In winds of 12 knots or more, I would suggest that dye marker be tied to the sea anchor. We sailed out of the first slick from a dye marker thrown over the side, but after tying slick to the sea anchor we left a green trail that the DD officers said was easy to follow. My crew members performed excellently throughout the ditching.

► *BuAer Comment*—It is recommended that the dye marker be secured to any part of the raft, not necessarily the sea anchor. Pilot's recommendation about tying rescue lines to raft is a good one and should be followed.

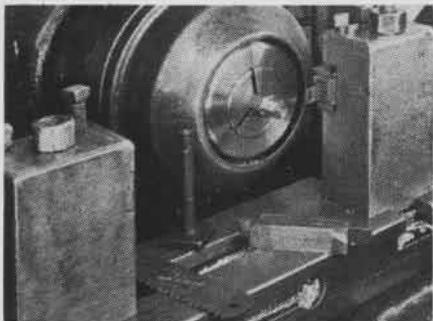
## Old Hacksaw Blades Make Tools

Through the Navy Employees' Suggestion Program, an employee of the apprentice school at the Navy Yard, New York suggested that broken or worn out hacksaw blades be used to make lathe parting tools that compare favorably in use with tools obtained commercially.

Eight of these tools can be made from a 1/16" x 14" high speed steel blade. The teeth are ground from the blades which is then cut into tools of the desired size by grinding. These tools are sharpened on both ends and are used in a simple tool holder consisting of a slotted metal block.

The principal advantage is the saving of high speed tool steel by the use of material that is normally scrapped. These tools have been in use for several months and have demonstrated their value.

[DESIGNED BY WILLIAM J. PATAKY]



SCRAP IS USED FOR LATHE PARTING TOOLS

## LETTERS

SIRS:

I have in my possession an invention which I believe will make a definite contribution toward safety in the navigation of military and commercial aircraft.

This invention was constructed while I was still in civilian status, and I did not have time to obtain a patent on it before I was inducted into military service.

I would appreciate it very much if you could give me definite information as to the procedure necessary to obtain a patent. VR-13

LIEUTENANT (jg) USNR

¶ The National Advisory Committee for Aeronautics, 1500 New Hampshire Ave., N.W., Washington 25, D.C., is the agency authorized by law to examine and evaluate inventions relating to aircraft or aircraft accessories submitted to any branch of the government of the United States.

It is suggested that the writer submit a complete description of his invention to the NACA for its comments. He may subsequently take steps to secure patent protection through government channels or through private counsel.

SIRS:

Is there any patch or badge that can be worn by men who have gone through Aviation Radar Operators' School?

There has been considerable discussion on this subject. Some say there is no official mark, and others say the shipboard radar striker's badge worn on the left sleeve between the elbow and cuff is permissible. Will you please give me the correct information on this subject? It would clear up this point for me as well as for many of my shipmates.

NAGS JACKSONVILLE SEAMAN 1c, AOM

¶ BuPers Circular Letter 65-45, dated 15 March 1945, states that non-rated graduates of Class A schools (and others) may wear a specialty mark on the arm halfway between the shoulder and elbow, in the place where the rating badge would be worn. The Aviation Radar Operators' School is not a Class A school, but the Aviation Ordnancemen's School is. Therefore, a seaman who is a graduate of the AOM school may wear the AOM specialty mark.

SIRS:

During the first hectic three months of the war, we of Patrol Squadron 22 often called ourselves the "Lost Squadron" in jest, and in more than one sense of the word "lost". When I read "Patrol Squadrons Cited" under Squadron Notes in your March 15 issue, I was nearly convinced we were forgotten if not lost.

Shouldn't your article read: "Patrol Squadrons 22, 101 and 102"?

VPB-135

LIEUTENANT (jg), USNR

¶ Yes, by a typographical error Patrol Squadron 22 appeared as VP-21.

# LETTERS

SIRS:

After reading your article, "Carrier Night Work," in the March 15 issue, I could not resist writing this little blurb. It is not my intention to detract from the excellent work being done in combat with the enemy by our Navy aircrewmembers. By the same token, aerial gunners should not detract from the credit due the unsung heroes of our devoted ground crew technicians, comprising the Navy's outstanding PATSU's, CASU's, FABU's, AROU's and other SU's too numerous to mention, without whom very few Navy planes would fly.

It is true that these ground crews do not perform spectacular feats that are unusual enough to inspire anyone to investigate the phraseology of requirements necessary for commendations, citations or medals. Even an encouraging slap on the back by anyone would help when difficult maintenance problems have been solved. Their's is truly a "Cinderella role."

Much more could be said on this subject, but I think it can be summarized by saying that today's aircraft are far too complicated and technical for one man to "know it all"—one group fights them, the other fixes them, and the Navy frowns on a "jack of all trades, master of none." I hope NANews will not take offense with this disagreement.

Further, I would like to request that a little credit and thanks be given to those "grease-monkeys, metal-benders, electricians, ordnancemen, radio and radar crews, cooks and general details too," who accompany our pilots and aircrewmembers on every hop with their hearts and devotion to duty, *only because everyone cannot fly*, and whose only reward is the feeling of gratitude to the Almighty when our planes return safely to the flight decks or coral strips.

ENSGN, USN

¶NANews is preparing a feature that will appear soon to familiarize the entire aeronautic organization with the superb job its aviation technicians are doing.

SIRS:

We do a good many things in connection with the war effort, one of which is qualifying pilots in carrier landings. The other day we noted a strange aircraft coming in for a landing. So we cleared the deck, manned the gear and brought the stranger in for about as pretty an arrested landing as we've had on board. Turned out to be a PAC1c—a new type to us—Pigeon, Army, Carrier, first class.

Anyway, the stranger landed and hot-footed it over to the landing signal officer's wind screen, which was then lying on the platform in a horizontal position—and tried to take a drink! A bowl of fresh water was

provided, and the outlook brightened at once. However, it was obvious that the "tired and hungry feeling" persisted. So word was passed for the pigeon fancier (Yes, we even have one of those aboard) to lay up to the flight deck.

Sizing up the situation quickly, the pigeon fancier took the bird in hand, uttered a few soothing words, and then ordered a double ration of the best pigeon feed. The bird ate a hearty meal, rested, had another shot of water, flapped his wings, and looked like he was in shape to take off.

Well, what next? The winning argument was that he only came out to qualify, since he had no load aboard (meaning message, this being a carrier pigeon) and had fully qualified in type for day landings, so let's launch him. The fancier was ready for this too and picked him up and shot him off by the double-arm catapult method.

The bird went out about 100 yards, orbited, returned and landed aboard. Thinking the launching method was unsatisfactory, the pigeon fancier shot him off again, using the single-arm catapult. But once again the bird went into the landing circle, came in high and fast, cut sharply, and hit the deck in a two-point attitude (standard for the type). Another launch, this time in darkness, was again followed by a quick return and smooth landing without lights or signals—fully qualified in type for night landings, whaddya know?

Next morning after a warm substantial breakfast and a quick warm-up on the flight deck, our friend was eager to get under way. So the pigeon fancier warmed up the two-arm catapult, wound him up and shot him off.

This time the PAC1c carried a message: "Qualified in type for carrier landings, day or night. Drained, refueled and launched. Carrier X."

We were only about 70 miles from land when the launch occurred. The bird took off on the right bearing to hit the beach, ETA 1 plus 30.

U.S.S. Bataan

LIEUT. COMMANDER

SIRS:

Appreciation is expressed for the excellent write-up of the *Liberator* turbo-by-pass and heater duct installations appearing in the February 15 issue of NAVAL AVIATION NEWS.

However, in order that due credit may be extended, VB-117 and Consolidated engineers developed the initial ideas and carried out preliminary tests. VD-5 continued the work and development after departure of VB-117 from the States.

VD-5,

COMMANDING OFFICER

FPO, San Francisco

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## ANSWERS TO QUIZZES

### ● NAVIGATION PROBLEM (p.16)

1. 247°
2. 0247 GCT, Jan. 10
3. 237°
4. 0232 GCT
5. 0255 GCT

(Tolerances: on MH's, 2 deg. in either direction; ETA's, 2 min. in either direction)

### ● BEST ANSWERS (p. 19)

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

### ● PIX QUIZ (p. 37)

- 1.1 2.2 3.2 4.3 5.3 6.4

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

### ● GRAMPAW'S QUIZ (p. 10)

1. Pilot in command. Ref: ACL 16-45.
2. 500 ft. Ref: Civil Air Regs. 60.343.
3. Open to prevent heat damage to electrical insulation. See par. 5 of FSB 6-45 and also Operating Instructions in *Pilots' Handbooks*.
4. Because the pilot is busy, tense and occupied while the back seat man is relaxed. Not because he takes any more "g". Resist "g" by tensing muscles, particularly stomach muscles. Ref: page 28 of G Sense.
5. a. The electrical system is being checked.  
b. In "emergency" conditions involving abnormal operation of the electrical system. Ref: TN 17-45.

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# FIRSTS

## in the life of a Tussie

FIRST YOU TAKE...



**1** FIRST MEAL



**2** FIRST LOVE



**3** FIRST MISTAKE



**4** FIRST HARP

**SafetyFIRST:** Identify When Approaching Friendly Ships



NAVY CAMERA RECORDS DECK CARGO OF OIL DRUMS PILED UP AMIDSHIP



JAP CRAFT CHURNS WATER AS NAVY PATROL BOMBER CLOSES FOR ATTACK

## ROVING NAVY PATROL GETS A SUGAR DOG

**N**AVY PATROL bomber attacks on Jap shipping in the Bonin Island area helped seal the doom of Iwo Jima. This small coastal cargo vessel, *Sugar Dog*, was spotted and destroyed during a search on January 11. Before launching its low level strafing attack, the Navy bomber came in close for a good look at the Jap craft's cargo of oil drums. Splashes leap up in the water all around the *Sugar Dog* as Navy gunners open up in a strafing sweep across the Jap's path. Its cargo and superstructure riddled and set afire by Navy machine gun bullets, the Jap vessel burns fiercely.

SUGAR DOG'S HULL IS RIDDLED AS MACHINE GUN BULLETS SPRAY WATER



OIL FOR JAP WAR MACHINES GOES UP IN SMOKE AS SMALL CRAFT BURNS

