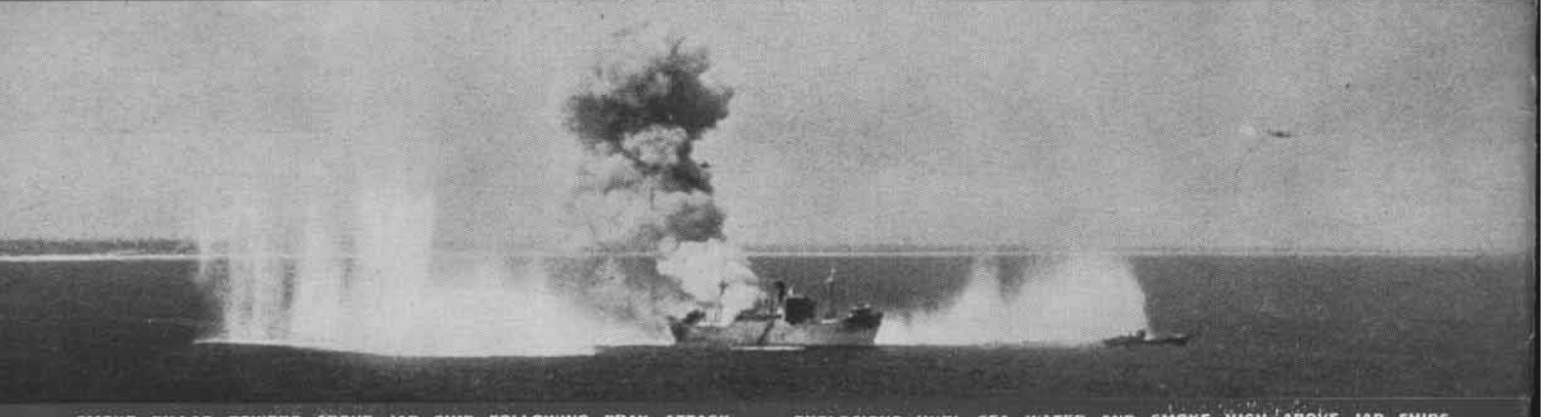
SAGA OF ONE PB4Y

Primarily assigned to reconnaissance, one Navy *Liberator* sank or damaged 66 Jap ships including one destroyer and ocean-going tanker.

DEVASTATED TINIAN, SMOKING FROM RELENTLESS BOMBING AND STRAFING, PHOTOGRAPHED ON ONE OF NAVY LIBERATOR'S 55 DARING MISSIONS



SMOKE PILLAR TOWERS ABOVE JAP SHIP FOLLOWING PB4Y ATTACK

EXPLOSIONS HURL SEA WATER AND SMOKE HIGH ABOVE JAP SHIPS

We're Bailing Out...

No. 11 of a series

A COUPLE of parachutes, plenty of iron nerve, some luck, and finally a good set of teeth recently enabled the Marine crew of a TBF to make an emergency landing with no casualties. The incident occurred during a well known engagement in the South Pacific.

The *Avenger* had just released its bomb load and was pulling out of its run. Suddenly fragments of a 2,000 pounder dropped by the preceding plane rebounded with great devastation and shattered the windshield, blew a hole in the bomb bay, and severed lines in the hydraulic system.

The crippled plane started back to home base. While appraising the extent of damage, Sergeant Cleveland M. Akey, tunnel gunner, noticed that the fourth bomb of the cluster, supposedly dropped, was loose in the bomb bay. Worse yet, it was armed!

Akey called into his inter-com: "Gunner to pilot—We've got a hot one back here. It didn't drop."

The pilot worked at the releases. No luck. Finally he succeeded in opening the bomb bay doors eight inches, but not enough to permit jettisoning the bomb. The pilot glanced toward the ground. There he spotted a friendly plantation. He picked up the inter-com.

"Check your 'chutes. We're bailing out."

Sergeant Akey hit the silk first, and dropped to safety. Pfc Ralph Borm, turret gunner, wasn't so fortunate. He parachuted right into a tree top, and one leg became tightly entangled in a sturdy tropical vine.

He pulled and twisted, but was secured in such a way that no amount of gymnastics would free him. Borm then started fumbling for his knife, but that had been lost in the plunge. He was "up a tree" in more ways than one, and likely to remain there indefinitely.

Private Borm settled down and made a mental survey of the entire situation, terrain, and his position. After some thought, he decided his one best weapon was himself—whereupon he started to viciously chew away at the vine. Finally it parted, and dropped him to the soft earth.

Aircrewmen have what it takes!

PHOTO INTERPRETATION

JAP SUPPLY DUMPS

THE ENEMY cannot move or fight without first collecting considerable supplies of food, ammunition, fuel, engineering and ordnance stores. To make possible continuous supply, these materials are collected at intervals to the rear of the fighting forces where fighting fronts are already established, or along projected lines of advance in a new campaign. It is highly important for photo interpreters to keep constant track of enemy supply activities to estimate their powers of resistance and foresee planned moves in new directions.

Generally a dump will contain one class of supplies and vary in size from large facilities in rear areas to small piles of supplies in forward areas. Usually dumps are fairly easy to spot from the air or in aerial photographs but in cases where there is heavy foliage or camouflage tracks and roads leading into the area may provide a good key to spotting the dump location.

SUPPLY DUMPS can be broken down into three types: (a) Permanent—located in rear areas—usually in patterned layouts of separate buildings connected by RR. (b) Distributing—located in stacks or buildings on beaches and docks or in wooded areas at terminal points. (c) Temporary—located in forward areas in storage pits, buildings, magazines or stacked in any wooded regions. By locating supply dumps in aerial photographs interpreters can point them out as number one targets for bombing, depriving the Jap of supply.

Double rows of crated plane parts are protected from nearby explosions and attacking planes by square three-sided shelters at edge of airfield on Maloelap. Japs use sod-covered earth revetments of this nature to protect planes and dumps of supplies.

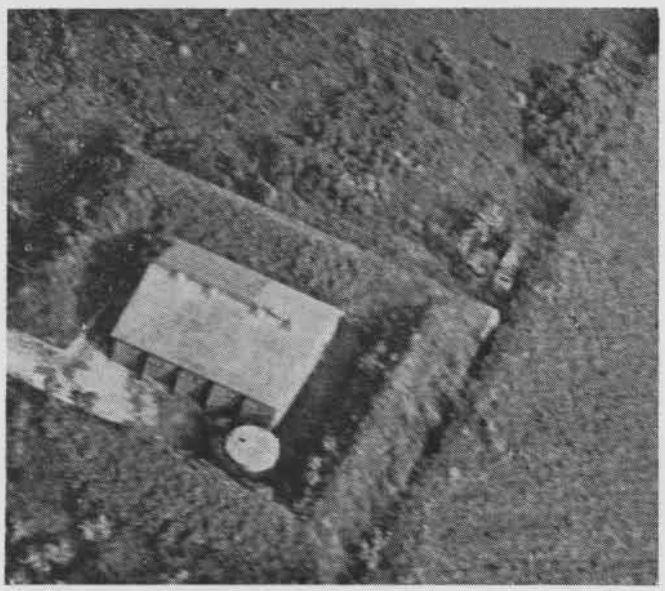
LAYOUT OF DUMP TIPS OFF WHAT JAP MATERIALS ARE STORED THERE

IN LEARNING to spot supply dumps it is important to note that the layout will indicate whether the dump is ammunition, explosive, gas, fuel, food, ordnance, etc., and that the nature of the material stored is also indicated by the sturdiness of the structure housing it and the protection around it. Ammunition dumps are spaced at wide intervals to minimize destruction of an entire dump if one stack is destroyed. To withstand near bomb hits explosive and highly inflammable materials are protected as much as possible within strongly reinforced revetments or stored in concrete magazines and underground hides with extra bomb resistance.

Fuel dumps vary from large tanks in rear areas to small drums in forward areas. Drums are dispersed in pits, holes, earth-covered shelters, loose under foliage and stacked in neat rows. Food, engineering and other such supplies can be spaced at close intervals and when not in sheds and huts are stacked in the open, in an irregular arrangement.

Jap areas loose store dumps are filled largely by this type of material and the large areas of ground are covered. Tree groves, plantations and other vegetation are used to provide camouflage and hide these dumps as much as possible. In the photograph above crated stores, probably plane parts, are stacked in square three-sides shelters at edge of air field. These are constructed of sod-covered earth with blast walls protecting the open sides. One of these shelters is built about the base of a palm tree for camouflage.

SUPPLIES OF explosive of highly combustible nature are often stored in sheds like the one below at left. Construction is concrete with metal roof and ventilators along the peak. Heavy blast wall of earth and concrete has sod cover for camouflage and retention. Circular tank within revetment for water. The log-revetted shed was photographed at Betio where it was an armory and warehouse.



Explosive storage building, 50′ x 50′, probably for bombs at Aslito field, Saipan, is protected by heavy revetment of reinforced earth

One of the few Japanese buildings left standing on Tarawa when the Marines took over was this log-revetted shed used as armory

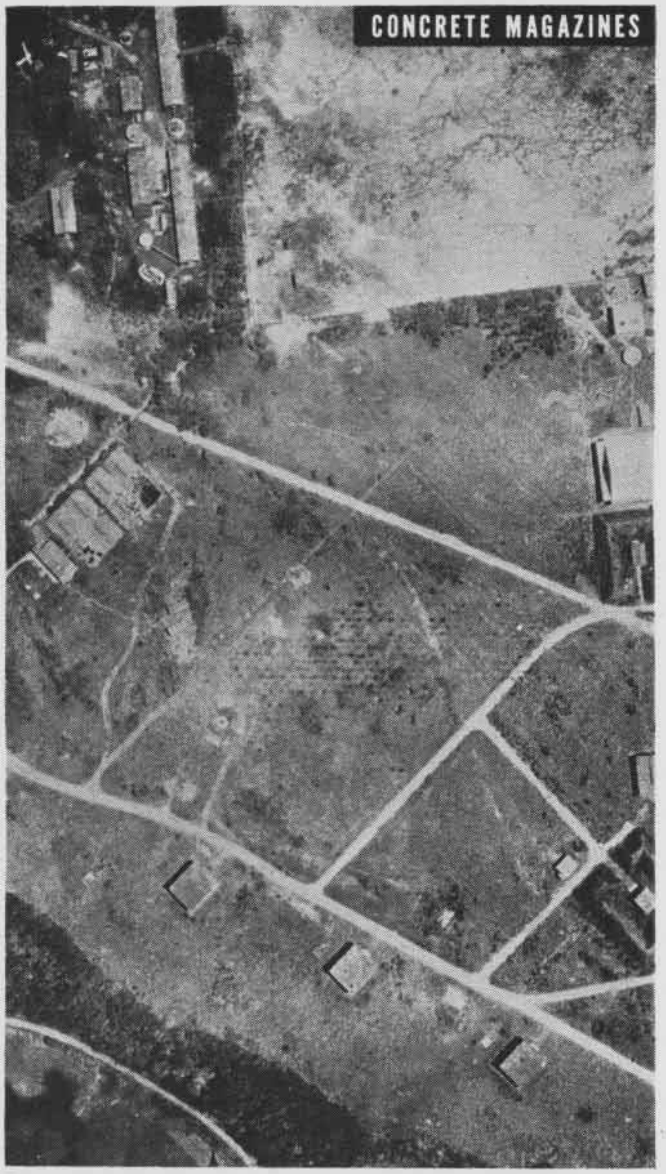
JAPS USE CONCRETE STRUCTURES FOR STORING FUEL, AMMUNITION

THE PHOTOGRAPHS on this page illustrate standard types of concrete storage buildings found on most Japanese major bases and used to house fuel and ammunition. Their square, sturdy appearance makes them easy to identify, and they are usually dispersed in a linear pattern along a roadway for easy access by truck. There are two distinct types of these structures. The first, used to store ammunition, is usually about 50′ square with a small porch covering the entrance which is in the center of one side, and ventilators which project above the roof on the other three sides.

The 3′ thick ceiling slab and the 2′ 8″ sidewalls are heavily reinforced with steel making the structure highly resistant to anything other than a direct hit by bombing or shell fire. The battered remains of these buildings have been found standing after the most intensified attacks. The sides of these buildings are usually camouflaged with dazzle painting, and the roofs are covered with sod and vegetation. This may make them slightly less conspicuous from the air but makes them no more difficult to spot in stereo photographs. Shadows cast by the heavy square structures are a dead give away. Some are completely covered with mounds of earth with only the ventilators projecting above the ground. On the interior there are usually four square posts supporting the roof slab and the ammunition is stored in crates arranged in rows and stacked from floor to ceiling.

THE OTHER type of concrete structure is used for storage of oil in drums. A typical one measures 52′ by 57′ and is different from the ammunition type in that it has windows and does not have the porch in front or the ventilators on the three sides. Otherwise the two types are very similar in both construction and appearance, a fact worth noting.

GASOLINE AND oil drums are often stored in long trenches and covered with sod or buried in the sand along the beaches. These sod-covered drums are elevated slightly above ground level and can be detected by use of stereo pairs of photos. Pits for storage of fuel drums show up in reconnaissance photographs as light patches of scarred earth.



Typical layout of concrete storage buildings photographed at Saipan shows conspicuous shadows of structures along roadway

Two types of concrete storage buildings are shown here. Square structure in foreground with three ventilators and sod-covered roof used to house ammunition. Similar type in background with windows and no ventilators used by Japs to store oil in drums

Entrance to probable underground storage at Vunakanau shows difficulty in spotting some such areas well-camouflaged by trees

Huge oil tanks buried in hillside at Saipan easily recognized in photographs despite attempt to make them blend in landscape

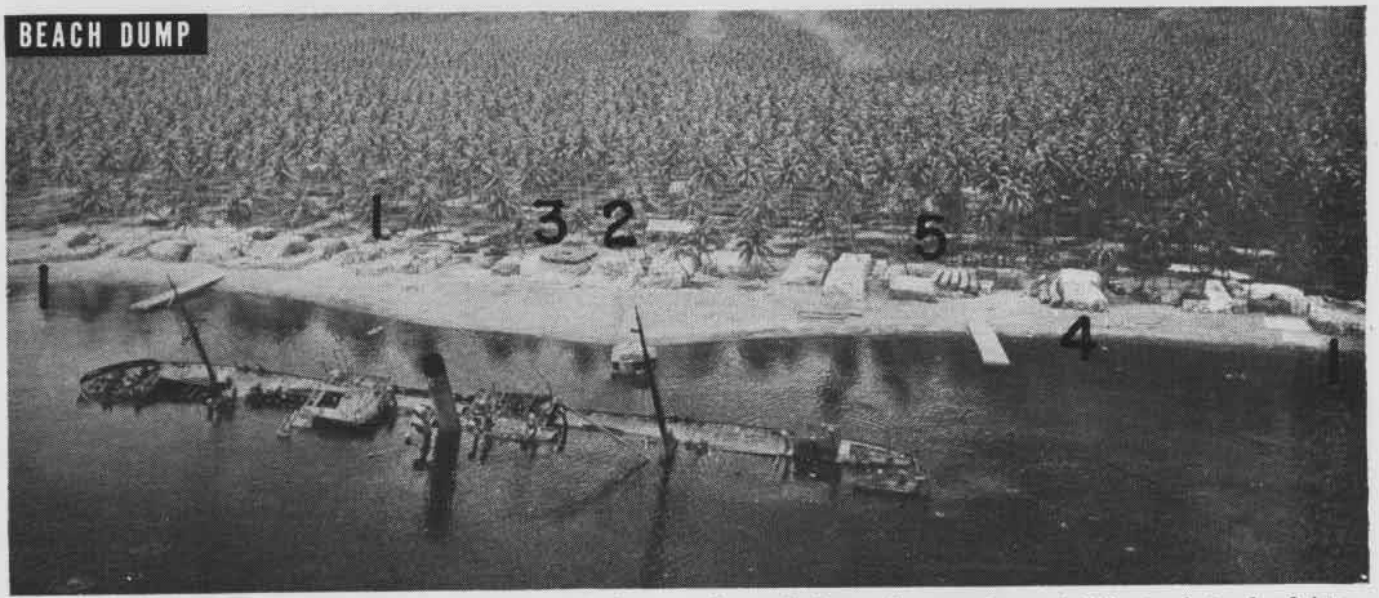
UNDERGROUND SHELTERS HELP JAPS TO PROTECT SUPPLIES, AMMUNITION

THE PRACTICE of storing ammunition and other materials under ground is quite common at Japanese bases, and though these dumps often may be difficult to spot from the air, they are usually easily identified in reconnaissance photographs. The huge 5,000-ton tanks shown above which the Japs used for oil storage on Saipan were sunk in a hillside and camouflaged and protected with 2′ concrete slabs on I-beams and 5′ of sod and vegetation but their distinctive circular shape and the "radius" path leading to inlet valves in their centers made these installations very noticeable.

This type storage usually found at larger "inner bases." Camouflaged building half buried in hillside is probably storage for seaplane base at the bottom of the hill. The practice of burying stores in hillsides is very common and these locations are usually the most difficult to spot. In some cases underground storage for ammunition or explosives can be spotted by narrow gauge railroads or roads leading into the units. These show up clearly in photographs. Regular patterns of ventilators on roof are typical.

Ammunition at Kiska and Attu was stored in dugouts and in small heavily revetted buildings, usually located very near the AA batteries and defensive positions where it was used. Ready ammunition was found in compartments hollowed from walls of individual AA and CD gun revetments.

THE LOW OBLIQUE photograph below shows a typical Japanese beach dump with loose stores scattered in piles along the palm grove beach. Some are covered with canvas for protection. This type of dump is a distributing point where supplies are unloaded and later delivered to various points by truck. Various piles shown include: *1.* Boxes of various canned foods or small arms ammunition *2.* Sacks of rice, the most important item of Japanese food *3.* Fuel drums *4.* Machinery parts and *5.* Bombs in crates.



Sunken Keifuku Maru marks a typical beach supply dump for loose stores at Vunapope. This type dump is a distributing center from which supplies can be carried by truck to the fighting forces, and is characterized by casual arrangement of stores

CLOUDS OF BLACK SMOKE rise from this oil storage tank hit in a Navy attack on Truk. This reconnaissance photograph shows loose supplies piled in casual heaps for temporary storage. Fuel drums are stacked along narrow gauge railway and lumber and other building supplies have been dumped along roadside. Roofs of storage warehouses have been shattered. Photo Interpreters have observed that many military buildings constructed by the Japanese are shipped in a prefabricated condition and the units then assembled at the site. Prefabricated trusses and wall sections are frequently observed in photographs of supply areas. The irregular pattern of a dump containing loose stores and building materials is in striking contrast to regularity of other type dumps like fuel drums, a difference easily spotted.

GRAMPAW PETTIBONE

Check That Tab

Upon being catapulted from a CVE, a TBM was seen to pull up into a very steep climb until, upon reaching 200 feet, it fell off into a spin and crashed, killing all three occupants. Full tail-heavy elevator tab setting was believed to have caused the accident.

▸*COMMENT*—This is one of several very similar accidents in recent weeks. In view of this, it is seriously recommended that pilots make an extra check of the elevator tab setting before being catapulted.

Give Your Engine Air

A squadron recently lost two SB2C airplanes at sea because of engine trouble. A few days later a third airplane had similar difficulty in flight consisting of severe loss of power and backfiring. This airplane, however, was able to remain in the air and return to base. Inspection revealed the trouble in this case to have been caused by a flapper door breaking loose and lodging so as to shut off the air supply to the carburetor. This flapper door failure may have been involved in all of these cases.

▸*COMMENT*—A broken flapper door is not the only way that the air supply to the carburetor can be shut off. There is always the possibility of rags, birds, etc., fouling air ducts. These accidents bring out an important secondary use of the alternate air system which, it is believed, is not fully understood by all pilots.

In the case of the engine trouble noted above, the pilots took every measure possible to make certain that the engine was getting adequate fuel and that the ignition system was properly turned on. However, they apparently never thought of the fact that the engine also required air to operate. Had they suspected that the carburetor air supply was shut off, they should have known that they had an *alternate* source of air immediately available in the alternate air system. Had the pilots shifted to alternate air, it is probable that both of the crashed airplanes could have continued flight.

Critical Weight and Balance

Case 1. An R50-5 went into a steep climb shortly after take-off, then squashed into the ground, out of control.

Investigation of this accident disclosed that the pilot (3,200 hours) had commenced his take-off without checking the load distribution. He may have done this before, but this time it was

fatal—eleven of the sixteen persons aboard were killed. A review of the loading showed the distribution to be such that the CG was aft of the maximum safe limit.

This case was referred to the Naval Aviator Disposition Board in accordance with paragraph 4 (j) of BuPers CL 62-44. The pilot was disenrolled from the naval service.

Case 2. Approximately 30 mins. after take-off, a heavily loaded PBO-1 was observed in a spin at 3,000 ft. Recovery was not effected and all aboard were killed in the ensuing crash.

In this case, weight and balance had been carefully checked prior to flight and the crew warned against shifting weight aft.

It was the opinion of the commanding officer that some of the crew, thinking perhaps the danger from loss of balance was over once the airplane was in normal flight, did move aft prior to the time the pilot lost control. A recheck of the loading showed the CG could have been moved beyond the maximum safe limit by the shifting aft of only two passengers.

▸*COMMENT*—The latter case shows that whenever the CG is near the maximum safe limit, pilots must explain this carefully to all aboard and personally retain absolute control of all shifting of weight until the CG is within safe limits.

Wartime conditions require service aircraft to be operated at maximum efficiency, which means operating right up to the loading limit. It is the last thousand pounds that enables military aircraft to reach vital enemy targets. It is also this last thousand pounds that becomes the most critical, as far as weight and balance is concerned. Since marginal stability may mean the difference between complete success or failure, it behooves all flying personnel to become thoroughly indoctrinated in this important subject and to exercise constant vigilance on weight and balance control.

See Technical Order 97-44.

Big-Hearted To A Fault

We got dizzy, too, just reading about this belly landing:

"Flying wing on Ensign A, I broke off for my approach; Ensign A took a wave-off so I proceeded to land. When approximately 50 feet off the deck in my final approach, Ensign A called on his radio stating his wheel indicators showed wheels 'not down.' I took a wave-off, joined up on Ensign A and told him his wheels were down. I started another approach, wheels down, when Ensign A asked for me to check once more. I *raised* wheels and joined on Ensign A. Again I told him his wheels were down as far as I knew. Again I started my approach, which was very long because of an SNB landing before me. At an estimated 20 feet, in the full stall position, two red Very lights went off. Before I had advanced my throttle I hit the runway."

A Commanding Officer Reports

". . . It was a fighter sweep and all we know is what we have written to his family, that he just did not come back when it was all over. No one saw anything happen to him. It was the same thing in the case of the other two pilots we lost. We have absolutely no information on any of them.

"It's the old story—stick together; if not, suffer the consequences. All our previous warnings about what would happen to them if they didn't stick together, were of no avail. That's the queer thing about young pilots—they have to get a shock like this before they are convinced. Only these three didn't live to profit by their mistakes."

'Thumbs Up! Start Engines!' Taxi signalman aboard carrier directs the *Hellcat* pilot as chockman watches closely. Correct deck signals are necessary to keep operations moving

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. **If you were flying as wingman in reduced visibility and you suddenly *felt* as though you were in some unusual altitude, what should you do?**
2. **Following an unusually hard landing, what precaution should the pilot take?**
3. **Do regulations make the wearing of shoulder harness mandatory?**
4. **If you were in position to take off and you received a red light from the tower, what should you do?**
5. **What are the first three things you should do to regain fuel suction if a tank is run dry in flight?**

Answers on Page 40

New Air/Sea Rescue Form

In response to demands from the fleet for a simplified, yet all-inclusive reporting of air/sea rescue operations, a new form (NavAer 1941) has been prepared and is now being distributed to the service. This new air/sea rescue form attempts to obtain more information, which will be the basis for initiation of improvements aiding both the crash survivors and rescue agencies, without overburdening the air combat intelligence officer who fills it out. The new blank replaces Form S52.

The ACI officer's task is made easier in that he may check the proper boxes in reporting ditchings and rescues which are more or less routine and yet the new form obtains sufficient information for analysis of causes for delays or failures. These studies will be made both by the chain of command and safety officers of the Navy Department in Washington.

In order to expedite corrective action, one copy of the form will be sent to either ComAirPac or ComAirLant, depending on the theater of operations.

Ditching Reminders

An SBD was forced to land in the open sea after engine failure. Weather and sea conditions at the time consisted of a negligible surface wind and a moderate ground swell. The pilot elected to land into the wind and across the swells. His plane hit a swell head on and came to an abrupt stop. The gunner got out unhurt, but the pilot was evidently severely injured. He gave one yell at the moment of impact and did not get clear before the plane sank.

Although there was insufficient evidence to determine exactly what happened in this case, reports of similar ditchings have disclosed several errors which may have been involved. The reporting officers accordingly recommended that pilots be reminded of the following important points when ditching:

1. Land parallel and along the top of moderate or heavy ground swells. *(Comment:* Where very strong winds are blowing, aircraft should be ditched into the wind.)

2. Remember that the sea is usually much rougher than it appears from the air.

3. Be sure that the cockpit enclosure is not only fully open, but that it is *locked open*—so that it will not jam shut upon impact.

4. Be certain that shoulder straps are properly adjusted and fastened. As an extra precaution, put your left arm up in front of your face just as plane contacts the water.

A Pointed Lesson

A two-plane section of SBD's on routine inshore patrol became separated when they entered a bad weather area. One returned safely to base, but the other became lost.

The return of only one plane to base was the first indication received that the airplanes were separated. Contact with the lost plane was immediately established, but the first RDF bearing sent out was a reciprocal. Before homing could be completed, the lost plane radioed that he was out of gas and was making a forced landing. Thorough and prolonged search of the area failed to reveal any trace of the plane or its occupants.

In reporting the case, the commanding officer said:

"The lessons to be drawn from this incident are few, and they are not new, but they *are* very pointed. It is desired to emphasize the following points:

"1. The first mistake was in the pilot needlessly getting lost, that is, by flying in instrument conditions when there was no necessity for it. In this case, two lives were sacrificed, and two others jeopardized, for no worthwhile reason whatsoever.

"2. All pilots on all flights should navigate by every means at their disposal. The attempt by a pilot to avoid doing his own navigation or to rely on mechanical navigational devices to the utter exclusion of his seaman's eye, is inevitably bound to end fatally.

"3. Survival and ditching sense must be driven home 24 hours a day, every day, so that the routine can be followed instantly when a pilot gets into trouble. Such items as jettisoning bombs to conserve fuel and turning on emergency IFF gear should be second nature, not things to do at the last minute, or when it is too late. Apparently only by ceaseless repetition can this be ingrained so that it is not forgotten in the excitement and stress of a tight spot.

"4. In cases of doubtful bearings, the standard practice of having the plane fly a course 90° from the original course for five minutes, and then taking another bearing, has proved itself time and again, and would obviate any possibility of a reciprocal bearing."

They Neglected One Item

The mech failed to remove the rudder batten.

The pilot neglected to check his movable controls.

The airplane swerved on take-off and crashed into a floodlight platform because the rudder was locked.

The pilot was killed.

Grampaw Pettibone says:
Amen and Hallelujah!

Amen, Skipper, to your all-out attitude on flight safety and to each of the points you so ably stress. Start growing whiskers, son, because this tabs you as my relief—Hallelujah!

An Almost Accident

A possible serious accident was narrowly averted in a PBY-5A recently. Someone had inadvertently inserted the gun sight male plug into the bomb release firing receptacle. This would have completed the circuit for dropping the bombs when the manual switch in the bow control panel was thrown to the "On" position. Fortunately the "setup" was caught before this occurred.

***Comment*—In the bow of the PBY there are two electrical receptacles; one for the bomb release firing key and the other for the gun sight or gun camera. Both receptacles are of the same type, but each is plainly marked to identify it.**

All PBY crews should be warned against the danger of making a mistake such as was made in this case. The serious results which can occur from negligence in this regard are readily apparent.

An additional guard against the occurrence of such an accident on the ground is provided by inserting latching (safety) pins in the bomb racks—to be pulled by the ordnanceman just before the airplane is launched. See ComAirLant 25-TB-44.

DID YOU KNOW?

Salvaged Shot Does Double Duty

Warrant Officer Balances Cranes

NAS, BUNKER HILL—Miners who used to shout: "Thar's gold in them thar hills," have their modern counterpart at this installation since the problem of balancing engine cranes came to attention. A warrant officer in charge of the metal shop division found the answer hidden in sand salvaged from the shooting range.

A suitable weight balance for movable U-type engine cranes used to change engines on planes, was badly needed. Cranes were often damaged from tipping over and created no little danger to personnel operating them.

Using sash weights for ballast was discussed but the idea was abandoned because cost made it prohibitive.

One day while poking about the salvage lot the metal shop division head noticed a pile of sand. His attention was drawn to several lead pellets nestling among the grains of sand. Struck by an idea the warrant officer shovelled sand into a container and brought it to a quick boil with a gasoline torch. From that pile of sand he recovered 1,658 lbs. of lead from shot scattered at the shooting range.

No cost was involved and the U-type cranes for lifting aircraft engines are no longer tipsy.

[IDEA BY J. G. GARY, CARPENTER, USN]

Navy Retreads Many Plane Tires

Rubber Can Be Traded by Services

More than 15,000 airplane tires are now being retreaded every month by the Navy as a part of its broad program to conserve rubber. Since equipment at various naval air facilities is being used for this work, the facilities and natural rubber supply of manufacturers is thus freed for production of new tires.

Although aircraft tires are subjected to tremendous shock and load, their working days can be greatly extended by proper care. The Navy has found that it is possible to retread tires more than once with complete safety.

Field maintenance officers in conservation have been sent by the Navy to overseas bases and carriers to investigate what work can be done there.

Of particular aid in rubber conservation is the cooperative system set up between the Army and Navy. Engineering changes requested by one service are cleared by the other and thus all tires of a given size are interchangeable between the two services. Should a sudden and unforeseen need for tires develop in one service because of losing a supply ship or for any other reason, that branch can now get its tires from the other branch, thus avoiding delay.

Hellcat Bears Mechanic's Name

Plane Captain Keeps It Fighting

The *Hellcat* plane pictured here, contrary to usual Navy custom, bears the name of the aviation machinist's mate

DEVANEY STANDS BESIDE PLANE HE KEPT FLYING

who keeps it flying, rather than the names of the pilots who flew it to shoot down eight Jap planes.

The machinist's mate, Charles W. Devaney, was plane captain of the *Hellcat* with VF-31. Even though the plane was damaged three times, Devaney kept it in shape for attacks against seven Jap bases. As a reward for his efforts, his name was painted on the plane instead of the pilots'.

The *Hellcat* first absorbed a burst of Jap gunfire in the engine cowling and wing and Devaney had it patched in half an hour. On the second occasion, bullets ripped out a section of wing and he repaired it quickly. Finally its hydraulic system was shot up, causing it to crash on a carrier landing. The crash ruined the engine, but in two days Devaney had a new engine back in the plane and it was ready for action.

Thanks to his work, the *Hellcat* took part in strikes against Kwajalein, Truk, Palau, Hollandia, Saipan, Tinian, and Guam, flying 50,000 miles.

Marine Aviators Set a Flying Mark

Hours Flown Top MarFairWest Score

MCAS MOJAVE—A recent highlight at this Marine station was the record-breaking feat of a fighter squadron, the pilots of which flew a total of 272.2 hours during a 16-hour period. Of this total, 247 hours were flown during daylight. The line kept 20 of 21 available aircraft in commission for the 16 hours and each averaged 13 hours in the air.

The previous record for a training fighter squadron in number of hours flown in one day was 186 hours. The MarFairWestCoast record was 226 hrs.

Navy Pilot Captures 500 Germans

Toulon Arsenal Had Held Flier A Week

A Navy pilot accepted the surrender of the Toulon arsenal and 500 Germans, during the initial phase of the Allied invasion of southern France.

The pilot had been taken prisoner by the Germans a week earlier when his carrier-based Grumman *Hellcat* was shot down by flak on a mission over Toulon. Captured after bailing out, he joined 23 other prisoners of war who were taken to the arsenal. There were Americans, Englishmen, Frenchmen and Algerians in the group.

All of the prisoners survived the bombing and shelling from Allied forces and that evening the German commanding officer summoned the Navy pilot. Unstrapping his gun, the German threw it down and said: "The war is finished. You are free."

All of the prisoners armed themselves, marched the 500 Germans out with their hands over their heads and turned them over to French Forces of the Interior. Then the pilot made his way to an American army airfield and was picked up there by a Navy torpedo plane and flown to his ship.

BEST ANSWERS

Events of World War II

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

1. Germany attacked Poland, without declaring war, in—

- ☐ *a*–July, 1940
- ☐ *b*–September, 1939
- ☐ *c*–November, 1940
- ☐ *d*–August, 1941

2. The Red Army occupied Eastern Poland—

- ☐ *a*–after the complete collapse of Polish authority
- ☐ *b*–after the surrender of Warsaw to the Germans
- ☐ *c*–to create a buffer between the Nazis and Russia proper
- ☐ *d*–to assist Germany in the quick removal of Poland from the war

3. During the six months following Poland's collapse, Germany—

- ☐ *a*–seized Norway and Denmark
- ☐ *b*–started major operations on the Western Front
- ☐ *c*–seized the Netherlands and Belgium
- ☐ *d*–quietly prepared for another offensive

4. The full strength of the German Luftwaffe was concentrated on England in 1940. That air blitz may best be described as a—

- ☐ *a*–costly failure for Germany because of heavy airplane losses
- ☐ *b*–German success because it wiped out the R.A.F.'s striking power for several months
- ☐ *c*–German success because it lowered British morale
- ☐ *d*–German failure because it had no effect on England's industry

5. Germany's desire to seize Crete was due to the fact that it—

- ☐ *a*–would give them stronger control of Greece
- ☐ *b*–is a stepping stone from Greece to Egypt
- ☐ *c*–held the approaches to Yugoslavia
- ☐ *d*–was the key to domination of the lower Balkans

6. The German armistice with France was signed—

- ☐ *a*–June 22, 1940, at Compiegne
- ☐ *b*–May 21, 1940, at Paris
- ☐ *c*–May 10, 1940, at Vichy
- ☐ *d*–August 18, 1940, at Versailles

7. The term "fifth column" was first used in connection with the—

- ☐ *a*–German attack on Poland
- ☐ *b*–German attack on Norway
- ☐ *c*–First World War
- ☐ *d*–Spanish Civil War

LST Operates as Aircraft Carrier

Recon Plane Hops Off in North Africa

Although launching reconnaissance planes from decks of LST's has now become somewhat common, the idea seemed revolutionary when it was first conceived before the invasion of Sicily. Details of the first experiment were recently revealed by the commander of an LST which launched four small planes during the Sicilian invasion.

Army commanders planning the invasion wanted to use small reconnaissance planes to spot enemy artillery and to act as liaison between forces. Engineers thought a flight deck for planes could be built on an LST in a very short time and LST 386 was assigned for the experiment. The first test was made in North Africa.

A light flight runway was installed on the LST 386 in 36 hours, topped with a metal landing strip mesh. One plane was taken aboard and the LST ran up to the northeast corner of Lake Bizerte. The plane pilot had never before flown from a carrier and no LST had ever tried to act as one. A medical officer, pharmacist's mate and fire fighters stood by ready for action.

When the LST 386 reached top speed the pilot was given signals to go ahead. There was no need for fire fighters or medical attention. The plane took off like a bird. From a nearby LST, the skipper signalled: "I saw it but I still don't believe it."

Since then LST's have posed as carriers in the Sicilian invasion, the landings at Anzio and in the U. S. Seventh Army's invasion of southern France.

NAVY DEPARTMENT
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
WASHINGTON

28 September 1944

Captain C. F. Greber, USN
USS MARCUS ISLAND
F.P.O., San Francisco.

My dear Greber:

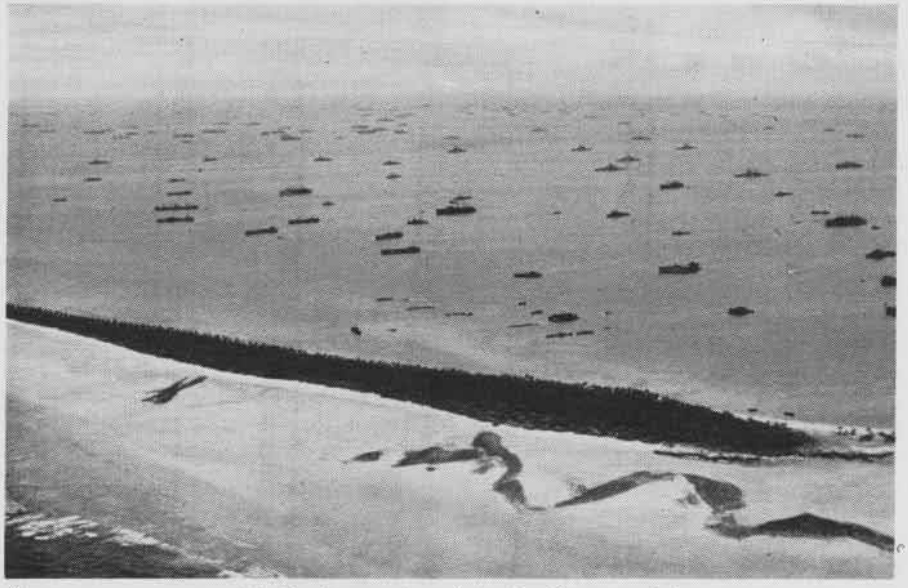
The Deputy Coordinator for War Bonds (AIR) has apprised me of the results of your five-day War Bond allotment program held during August. The final participation figure of 97% for both officers and men tops that of any carrier reported to date.

Your statement in "The Plan of the Day" that "I urge everyone of you to register a War Bond allotment in your own self-interest" is the essence of sound advice. The Navy is keenly alive to the importance of having its personnel register bond allotments and to their keeping them constantly in effect so that they will accumulate sizable funds.

I hope that the record of the USS MARCUS ISLAND will be an incentive to the Commanding Officer of every aircraft carrier to do likewise for his personnel.

My congratulations to your officers and men.

Sincerely,



SOMEWHERE TODAY *out in the far reaches of the Pacific are task forces as awe-inspiring as the one pictured here in this excellent aerial photograph by Navy photographers. For security reasons the locale of this picture cannot be divulged but the scene was taken offshore from a coral island in the Pacific. Here is shown only one small part of mighty Task Force 58. The sight would have sent chills down the spines of any Jap observers.*

SHORE STATIONS

▸NAGS JACKSONVILLE—On a base where every range has its pet mascot, the shotgun range takes pleasure in presenting its newest one, a female skunk. Citronella, as she is called, is a friendly little thing and thinks Navy chow beats the stuff she used to pick up out in the wilds. She likes any kind of meat, bread and milk, frogs and grasshoppers, and to see all the boys out chasing grasshoppers for her would make someone, who didn't understand the situation, think the whole range had suddenly gone "shotgun happy."

▸NAAS GREEN COVE SPRINGS—An AOM2c, of Tulsa, Oklahoma, served for 20 months in the Aleutians before being assigned to this station. Neither Japs nor weather gave him his worst moments. That role was reserved for a huge Kodiak bear. The monster tore out a corner of the base's meat house one summer night, and escaped before the damage was discovered.

The bluejacket was one of a patrol, armed with tommy guns, organized to go out and polish off the marauder. They finally cornered the beast and his mate, the latter a dainty little creature tipping the scales at 2,800 pounds. They had killed the female and wounded the big fellow, before he made a last maddened charge upon them. The men emptied their tommy guns into him, but he kept coming until he was only a few feet away. They were just regretting their Frank Buck expedition, when the bear dropped dead at their feet.

Upon investigation, the members of the patrol found that one of the tommy gun slugs had hit the beast squarely in the head—and the bullet had flattened out without piercing his thick skull. He weighed close to two tons.

▸MCAS MOJAVE—The versatility of Leathernecks here was underscored recently during a crisis at the station laundry. Both enlisted and commissioned Women Reserves responded to the plea for volunteers to break the bottleneck, but the unusual sight was that a couple of fighter pilots busily running steam presses.

▸NAS CAPE MAY—Shades of the past stalked the base this week, and mystery was in the air, when a bottle was found on the seaplane ramp in the VJ-5 area. A piece of paper could be seen through the green tinted glass, and curiosity ran rampant. Could it be the last will and testament of a lone survivor of a sinking? Did it find its way from lonely isle in the far stretches of the Atlantic? Finally the awed finder of VJ-5 opened the bottle and, with a note of expectancy in his voice, read the note to his shipmates. It said, "Tossed in by Robert G. Fuller, Marine Barracks Naval Air Station, Cape May, N. J., May 1941." The bottle evidently had been wedged under the ramp by the tides and washed loose by the hurricane.

▸NATB PENSACOLA—J. Gosling celebrated his thirteenth birthday last October 4th. The feathered friend of flight students at Pensacola is getting along in years. He has done three hitches in the Navy, since he joined the Naval Air Training program at the behest of Eddie Collins, who was then a civilian in A&R and is now an officer in the Navy. Though many confuse J. Gosling with Donald Duck, the Pensacola pet just can't find the animated movie star in his genealogy. In fact, J. was born some time before Donald came into existence, and has been attached to the station ever since, a symbol of the flight training program and an ever-present buddy to the students thereof.

▸NAS GROSSE ILE—The boots on this station had hoped they had mastered all the various commands in connection with the finest military technique of marching. They were a little startled, however, at a recent Line Crew muster, when an AMM1c hurled an unfamiliar one into their midst. As the men were a little away from the spot that he wished them to occupy, he gave the command, "Slide over, slide."

▸MCAS MOJAVE—One of the *Corsair* squadrons from this station is still waiting for lightning to strike their mess sergeant. It seems while up in the hills on training maneuvers, the sergeant nonchalantly tossed a couple of tacky-looking fishermen out of his mess hall, and followed them with a verbal barrage something like this:

"Why you ******—I haven't any too much food for my Marines. The heck with you guys."

As it happened, the visitors turned out to be a couple of Army generals out for a couple days of relaxation.

▸NAS NORMAN—Approximately 170 WAVES were undergoing an indoctrination in the use of firearms before assuming armed sentry duty. When the new schedule is launched, WAVES from A&R, Supply, and Operations will stand patrol posts carrying carbines. Regular classes are being conducted at the indoor range at Ordnance, the WAVES firing 22 training rifles. In the final phase of the course they will be taught to fire carbines.

▸NAS CORPUS CHRISTI—Total fire damage at this station during the past fiscal year amounted to only $529.00, lowest annual loss since the station was commissioned more than three years ago. This record, remarkable when the valuation of station properties is considered, points up the work of the NAS Fire Department in eliminating fire hazards and conducting its continuous fire-prevention program.

▸MCAS QUANTICO—Everyone here is going ga-ga over the bagpipe band which Marines brought back from Ireland. The 27-piece band is believed to be the only musical organization of its kind in the U.S. armed forces. The pipers led Marines in many parades in Ireland, and after five months of practicing on their liberty time, they took third place in a famous Irish piping event.

▸MCAS MOJAVE—Members of a radar unit operating far out in the Mojave desert live a rugged existence, but it became a little too rugged recently. The last cigarette was smoked down to the last inch so two of the crew plodded 17 miles across the wastelands, slogging it all the way in the boondockers.

They arrived at the little store, and were fabulously rewarded with the entire stock of tobacco—two packs of cigarettes.

▸NAS GROSSE ILE—This one really happened on NGI not so long ago. A WAVE was walking down Midway, when she was hailed by an anonymous bluejacket whose head and shoulders were sticking out of a man-hole. "Hiya!" shouted the bluejacket. "Hiya," the WAVE replied. And then quick as a wink and twice as smooth, she added, "Are you going down there to keep your mind company?"

▸NAS ANACOSTIA—A voluntary aviation familiarization course for WAVES has been inaugurated, and is well under way with more than 150 members enrolled. The course lasts approximately three months and consists of lectures and movies on Fleet Aircraft and Organization, engineering, aerodynamics, communications, navigation and actual flight time in transport type planes. Station operation pilots have been assigned to do the lectures. Supplementary movies are supplied by the training department. The course is expected to provide entertainment for after-working hours as well as increase WAVE interest and background in aeronautics in general.

▶MCAS EL TORO—Military appearance and courtesies, particularly saluting, have improved to a remarkable degree since the formation of an "awkward squad." This group musters at 0500 every morning, followed by one hour of drill and then instruction in military courtesy.

Officers as well as enlisted personnel are subject to appointment to the "awkward squad" for breaches of military courtesy, being out of uniform, and permitting violations of military courtesy on the part of subordinates.

▶NATB PENSACOLA—The A&R Department smashed all previous production efforts during August, when the shops pushed a total of 61 planes overhauled, assembled, flight-tested and delivered through their assembly lines. The figure exceeded by seven the old record which was established the month before. At the same time it was announced that an increase in the work load of the A&R shops, boosting the work demands to the highest level in the history of the Pensacola A&R, is in the process of being received. Relocation of some of the shops to make room for the additional work is under way.

▶NPFS ST. MARY'S COLLEGE—With a crucial football game looming the following day between the 57th and 58th Batts, the instructor was interested in knowing just who would be available. He asked, "Will any of you cadets have a watch tomorrow?" And without a moment's hesitation, one answered, "Yes sir, I'll bring my watch tomorrow; it's shock-proof and water-proof too."

▶NAS LAKEHURST—The General Electric "House of Magic" presented a science show for personnel of this station recently. Among other acts was a miniature electric locomotive which was run entirely by verbal commands. The locomotive obeyed the lecturer's directions of "Go Ahead," "Stop" and "Back up." By use of a phosphorescent screen the lecturer was able to walk off the stage and leave his shadow behind, fold his shadow up in a box, or do any of the innumerable things people wished they could do with their shadows.

▶NAS NORMAN—A swim to Tokyo is being conducted in the station pool to stimulate interest in swimming by all hands. More than 100 are in the competition. In order to keep as many of the personnel as possible interested, the first week of the swim was limited to one-half mile each day, and one mile the second week. The length of the pool is equivalent to five miles in the 8,000 mile distance to Tokyo. At the end of the first week 11 persons, including two WAVES, were tied for the lead at 112 lengths each.

▶NAS LAKEHURST—After the recent storm, an officer discovered a starfish on the roof of one of the hangars. Since starfish don't ordinarily live on hangars, he asked his men about it. Finding that nobody knew how it got there, he assumed that it had been deposited by the storm. Later it was discovered that a sailor had caught the starfish and placed it on the roof to dry.

TOKYO TALKS

—TO JAPAN

"Iki, waki, konki, sookekki" (meaning "spirit, harmony, stamina, total action") is Japan's latest prize-winning slogan, and has won for its author, Hachiro Suzuki, of Aichi prefecture, a 1,000-yen bond. The slogan was chosen from a total of more than 176,000 in a contest sponsored by the Imperial Rule Assistance Association (IRAA), Japan's totalitarian political party, and its subsidiary group, Imperial Rule Assistance Political Society.

—TO JAPAN

Mass prayers for victory were offered on the occasion of the monthly Imperial Rescript Day at 220 shrines throughout Japan and occupied Manchuria, the Domei news agency reported. Approximately 200,000 members of the Japanese "Association to Perpetuate the Spirits of the late Emperors Jimmu and Meiji" also prayed for complete annihilation of the Anglo-American enemies.

—TO JAPAN

The Japanese Domei agency reported recently that Taketora Ogata, President of the Board of Information, had declared "he definitely intends to lift unnecessary restrictions on news with the exception, of course, of those which might affect the strategy of the war."

Field Marshal General Sugiyama and Admiral Mitsumasa Yonai, Ministers of War and Navy in the new Koiso cabinet, have presented a joint army-navy proposal to their cabinet colleagues calling for "freer expression of public opinion with the object of enhancing home front morale and fighting spirit among the people."

Thus, in the future, the government will inform the people of the true state of affairs and thus strengthen their morale to meet any future circumstances. "The newspapers shall make use of all their facilities," Domei continued, "and try to enliven the pages of their newspapers. The facilities of the Imperial Rule Assistance Political Association shall be utilized to the utmost in making known the people's wish concerning political matters."

—TO OCCUPIED ASIA

The Tokyo radio reported a short time ago that the present quarter's output of planes showed a marked improvement over the previous quarter. This "reflects the inspired efforts of both the authorities and the people."

—TO JAPAN

Existence of a novel Japanese military institution—the "Mother Unit"—was recently revealed by the Tokyo radio. Members of such units are uniformed handymen who go along with Japanese troops in the field and perform such helpful little chores as making charcoal, preparing hot meals, cutting trees, weaving sacks, storing equipment and even mending the soldiers' clothing. They are known as "Mother Units" because they minister to the needs of the soldiers.

—TO THE WORLD

A nation-wide "thought drive," calling for the bolstering of fighting spirit and the destruction of "artifices of thought" among potential defeatists, has been launched in Japan under the title of "National Movement for Repulsing the Anglo-Americans by the Counter-Attacking of the 100,000,000 People of Japan." Sponsored by the Dai Nippon Educational Society, leaders hastened to add that the war could not be won by spirit alone. Increased war production and increased fighting strength are the prime critical problems at present."

—TO JAPAN

According to a Domei report, the Emperor has elevated Tojo's court rank from senior third grade to junior second grade in recognition of the former premier's past distinguished services. Japanese court rank is conferred on persons prominent in the Japanese government as well as on their heirs and Army and Navy officers. There are 16 grades from the senior grade of the first rank to the junior grade of the eighth rank. The Japan Year Book of 1939-40 reported 282,257 holders of court rank.

—TO JAPAN

Last February, when General Hideki Tojo became Chief of Staff of the Japanese Army, he moved his cabinet meetings to the Imperial Palace to cover its deliberations with the sanctity deriving from the Emperor symbol.

Now, however, the deliberations of Premier General Kuniaki Koiso's new cabinet have been transferred back to the official residence of the Premier. The Tokyo radio explained that the cabinet had moved out of the Imperial Palace "in order to stimulate active changes of views."

SHOW ME THE WAY TO GO HOME

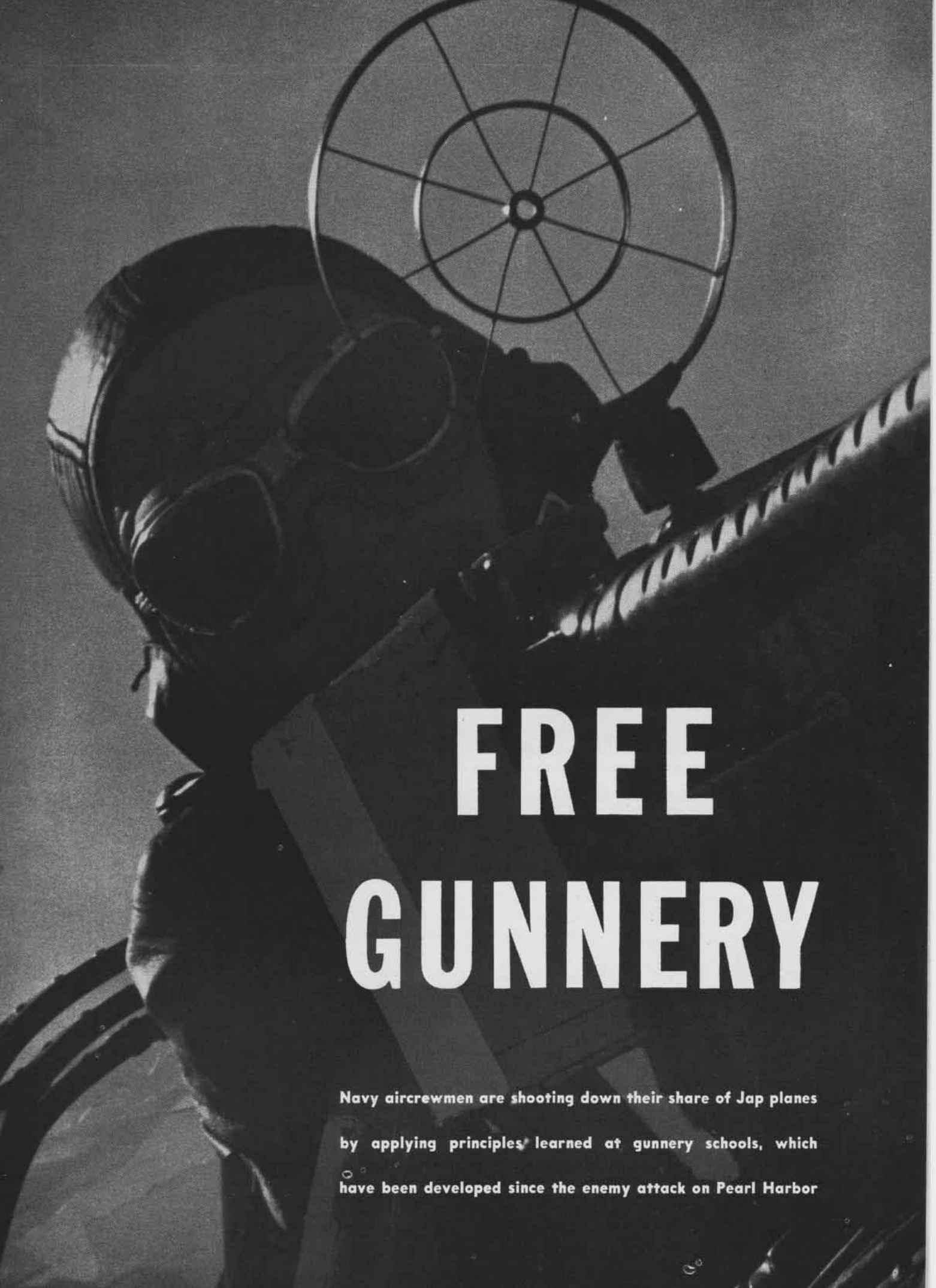
Time Problem

A plane took off from a field in Long. 164° 30′ W on May 15, local zone date, and flew for seven hours to a point at Long. 155° 45′ E, landing at GCT 1340.

Fill in the following blanks:

1. GCT and date of departure.....
2. ZT of departure.....
3. Greenwich date of arrival.....
4. ZT and date of arrival.....

(Answers on page 40)



FREE GUNNERY

Navy aircrewmen are shooting down their share of Jap planes by applying principles learned at gunnery schools, which have been developed since the enemy attack on Pearl Harbor

TRAINED FREE GUNNERS IN NAVY AIRCRAFT ARE SHOOTING DOWN MANY JAPS IN COMBAT BY USING PRINCIPLES LEARNED AT GUNNERY RANGES

FREE GUNNERY TRAINING

SHARP-SHOOTING aircrewmen, trained in the Navy's Free Gunnery schools, are accounting for their share of Jap planes being shot down in aerial combat along the Road to Tokyo.

Battle reports from the Pacific indicate the long hours spent learning to boresight, clear malfunctions and give correct deflection in shooting attacking planes are paying off when the going gets rough.

One such report, received recently, tells vividly how superior gunnery by aircrewmen on a PB4Y disposed of a Jap *Mavis*. "Accurate shooting from the PB4Y silenced the *Mavis* tail, starboard waist and top rear gun positions. Fire observed from an open hatch near the waterline. Hits in the No. 3 engine provided the fatal blow. Fragments of the *Mavis* wing peeled off and flames roaring back from the engine seared off the starboard section of the tail plane. As the Jap lost speed, the PB4Y tail gunner literally chopped off the *Mavis*' bow. The starboard wing of the stricken plane folded just before it hit the water with a crash and exploded."

AND ANOTHER combat report, this time against a *Betty:* "The bow turret opened fire at 1,500 ft. The initial burst was extremely accurate, incendiaries hitting the wing root and fuselage. The top turret fired a short burst, scoring accurate hits along the fuselage and cockpit area. The *Betty* dived into the water after only 275 rounds were fired, the pilot apparently dead at the stick."

Accurate shooting at specific weak spots of enemy aircraft, rather than spraying, is evidenced by both of those reports. Gunnery schools give them this training.

FIRST SCHOOL USED GUNS FROM PLANES WRECKED IN JAP ATTACK

THE NAVY has three air gunners' schools operating today, at Hollywood, Purcell and Yellow Water. Aviation Free Gunnery Units are located at Alameda, Coco Solo, Corpus Christi, Kaneohe Bay, Norfolk, San Juan, Barber's Point, Quonset Point, San Diego, Seattle, Whidby Island, Pensacola and Kahului. In addition, many air stations and other units operate gunnery refresher schools.

Four mobile training units tour the Pacific areas, giving refresher training to Navy free gunners wherever they may be. These men are to receive training every 90 days.

To assist in development and evaluation of a gunnery training program, the Free Gunnery Standardization Committee was organized a year ago. The committee consists of 12 officers, who recommend training standards, prepare syllabi, compose text books, assist in training teachers.

Since Pearl Harbor thousands of gunners have been turned out by the schools and units, but when the Japs pulled their sneak attack there were no training schools for flexible gunnery. Before then, the rear seat gunners in TBD's, PBY's and SBD's were trained by squadrons themselves. Some gunners got as few as 50 to 100 shots a year in practice firing, less than today's student gets in a day.

On the day after the Jap attack, Patwing 1, based at NAS, Kaneohe Bay, began free gunnery training. Using .30 and .50 cal. machine guns salvaged from wrecked planes on the station runways and parking aprons, the school was operating within a few days.

NAS San Diego also opened one of the early free gunnery schools. After Kaneohe was in operation, a program was set up by the Navy department to train gunners in various parts of the United States. Owing to a shortage of officer-instructors, the Navy recruited civilians who were experts in small arms and set up a school at Pensacola.

They were given a five-weeks course in how to teach free gunnery to enlisted men. Since then more than 700 officer-instructors have been turned out at Pensacola, plus nearly 1,000 enlisted instructors now rated as Specialists G.

Free gunnery training unit at Kaneohe Bay trains .30 and .50 cal. marksmen who fire at sleeve target towed over the ocean

Aviation activities all over the globe give refresher training to their aircrewmen. Gunner is firing on Espiritu Santo range

Boresighting of machine guns, to test accuracy of sights, is one of first things taught embryo marksmen at all gunnery schools

Stripping his gun, this mech learns the names of parts and how they are assembled. Many hours of training are spent on this job

GUNNER MUST MASTER SIGHTS IF HE WANTS TO BECOME MARKSMAN

THE FIRST thing the neophyte gunner learns when he enters school is sights and how to use them. Just how important this is can be seen by the fact a fourth of his five-weeks training course is expended on that subject.

Sighting now is taught as a unified course, closely correlated with work on the ranges and other phases of training. The free gunner must recognize enemy planes, know when to start firing at them and where to fire to get hits. Fast reaction time is vital in a job where split seconds pay off.

First must come knowledge of the standard Navy 35-mil radius gunsights—iron ring sights, reflector sights and self-computing sights. Along with this go constant practice at stripping guns and analysis and correction of malfunctions. So that he will know when to start firing at a plane he has identified as an enemy, the gunner must be able to tell when it is in range.

In the first weeks of training, the gunnery school also gives the student boresighting, effect of bomber speed on bullets, pursuit curves and position firing. But the most emphasis of gunnery training, throughout the five weeks course, is on actual firing rather than classroom theory. Most men learn best by doing and for that reason many hours are spent stripping their guns to teach how they are assembled and kept in good firing trim under all conditions.

THIS SAME theory is followed through into operational training. As at gunnery school, the student pilot and gunner have to check their guns in and out each day, install them in the plane and remove them when the day's work is completed. In gunnery school, he has to take the "guts" out of his turret or mount many times and install them.

Range estimation is another of the early phases of gunnery, using the ringsight rads or radii to tell when an attacking plane is within the 2,000-feet effective firing range.

Malfunction range at Hollywood gunnery school teaches men how to find the things that go wrong with weapon, how to fix them

Code and blinker practice are continued all through gunnery so that future aircrewmen will keep sharp on their communications

POSITION FIRING IS BEST SYSTEM TO KNOCK DOWN ATTACKING PLANE

THE AERIAL free gunner's job is primarily defense. He has at his disposal a single or twin .30 cal machine gun or single or twin .50's. With these he must oppose the half dozen .50's and sometimes 20 mm. cannon on the enemy.

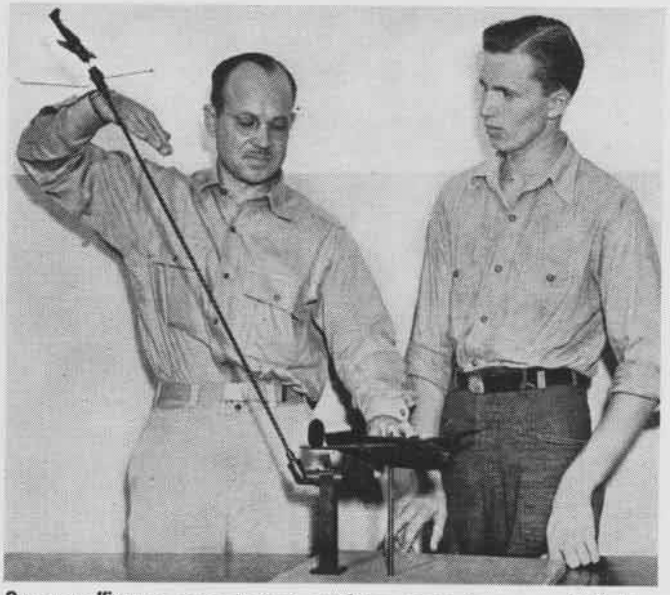
Obviously, the gunner cannot beat off the fighters by throwing more lead—his big advantage is that he can aim his guns without pointing his plane. He can fire at the fighter at times when the enemy pilot cannot return fire.

Four general styles of sighting are used by gunners, although the latest and most effective against attacking fighters is the position firing method. An older method, still used for training, is the 2/3 second. A third system, taught on break-aways only, is the "fly through." In this the gunner merely pours a stream of lead well ahead of the enemy plane and holds it until the plane flies through it. Percentage of hits by this method naturally is small. The fourth method is tracer fire, now little used.

The leading characteristic of the 2/3 second method is that deflection is along the line of apparent motion, with the gunner having to determine the amount. Position firing also calls for deflections along the line of apparent motion, but the amount of deflection is predetermined in rads (sight radius) on the ringsight. The latter method is simpler and more easily used by aircrewmen in combat.

THE BRITISH RAF was the first organization to develop and adopt the idea that a gunner could use predetermined deflections in combat. Early in the war, RAF gunners used the relative speed sighting system, but abandoned it for the zone system, similar to position firing.

The three principal steps of the 2/3 second method of sighting are: 1. Recognition and range estimation. 2. To establish the proper lead, stop the gun when the enemy plane reaches 2000', let it move away from the sight center for 2/3 sec. (the time it takes the bullet to get there), note the direction and distance the enemy moves across the sight—place him in the same relative position on the opposite side of the rings, and open fire 3. Decrease lead gradually as he comes in until firing is pointblank at plane.



Gunnery officer at NAS Miami explains pursuit curve of fighter aircraft. Beads below and above it indicate gunner's aim point

Shotgun with spade grip, mounted on swivel, give gunner practice in firing at clay pigeons tossed into air from varied angles

Ringsight helps gunner estimate range, deflection to use when firing at attackers. This operation must be automatic in action

Piper Cub at NAGS Hollywood zooms over dummy guns as students learn to use ringsights to estimate range of incoming planes

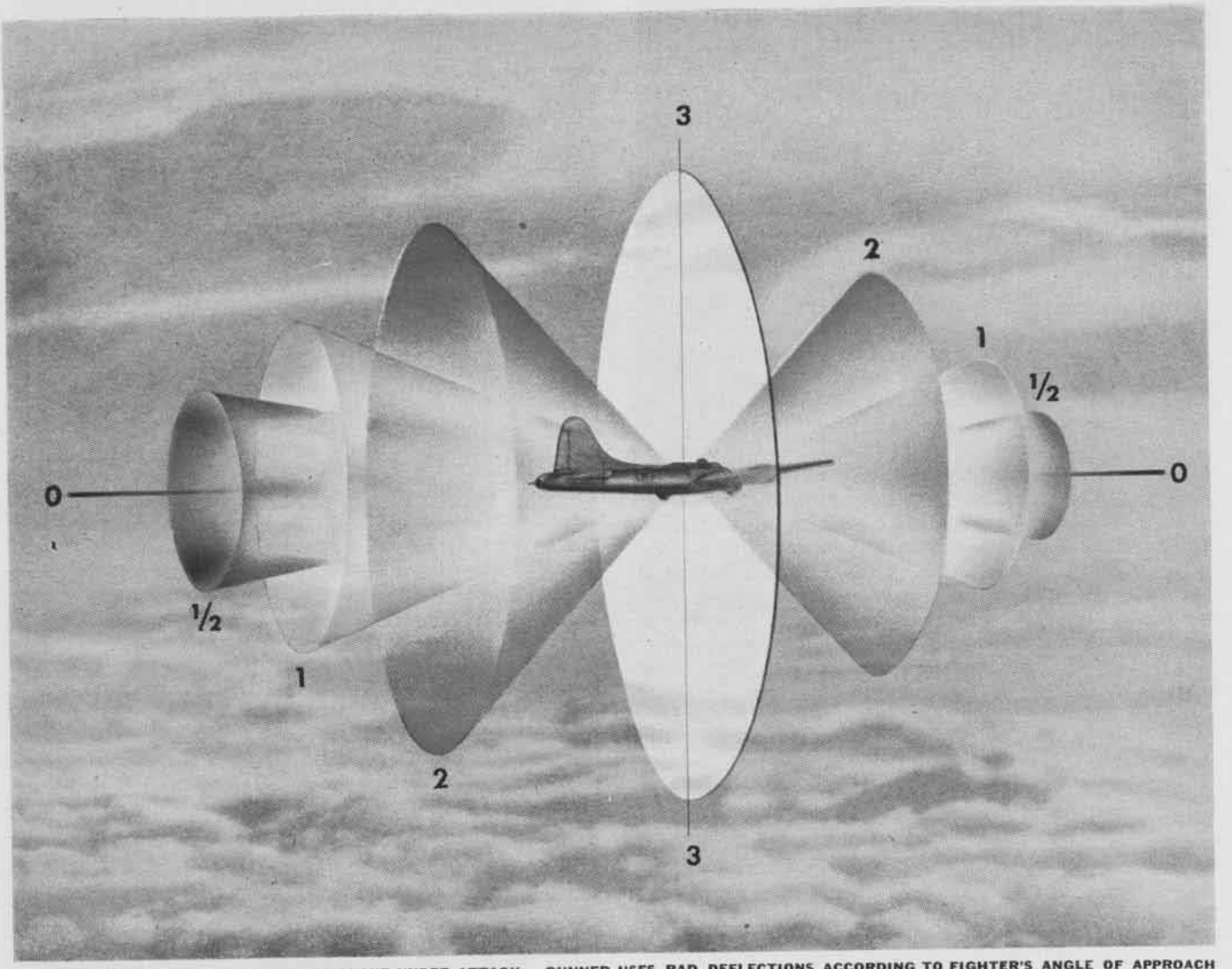


CHART SHOWS CONES OF FIRE AROUND PLANE UNDER ATTACK. GUNNER USES RAD DEFLECTIONS ACCORDING TO FIGHTER'S ANGLE OF APPROACH

POSITION FIRING IS CALCULATED AGAINST PURSUIT CURVE ATTACKS

BECAUSE THE most dangerous attack on an aircraft by another plane is when the latter is flying in a pursuit curve, position firing was developed mathematically, then proved in combat as the best method of shooting down this attacker.

Colored charts presented on this page and the following, produced by the Army Air Forces, illustrate key principles of position firing. Pursuit curve attacks are a standard type of fighter attack and the Navy and Army have adopted that method to counteract them. Fighters must continue to fire just ahead of the other plane's nose and keep turning in the direction it is flying. They have no choice but to fly in this curve or their bullets will not hit. Since the attacked plane knows they must fly such a curve, it is easy to compute the lead and wing them with a few correctly aimed bursts.

The top illustration on this page shows the theoretical cones which surround a bomber, from bow to tail. The free gunner must visualize these cones when he figures out the deflection to use against a fighter. Cones should be remembered by their number, since these indicate the number of sight radii deflection the gunner uses, regardless of whether the attack is from above or below, fore or aft. A fighter approaching from the angle indicated by cone two is given two rads of deflection. Those coming in at right angles to the fore-aft axis of the plane draw three rads of deflection. These deflections are based on 200-knot speed.

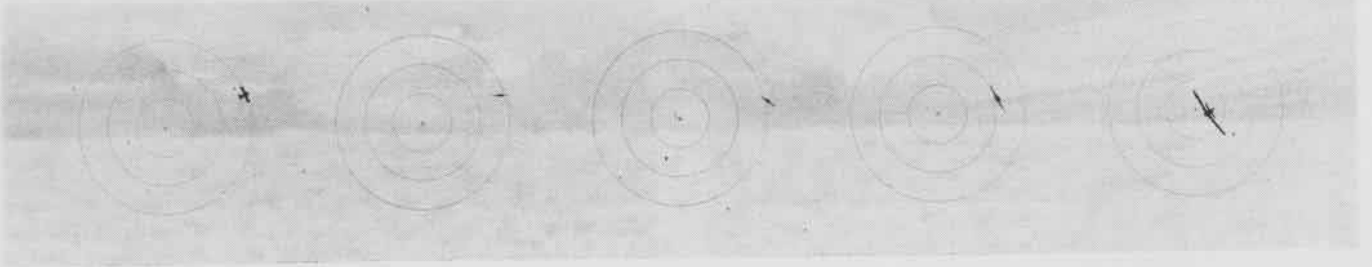
1 HE'S 3000 FEET AWAY BE READY BUT HOLD

2 STILL TOO FAR AWAY BUT START TRACKING

3 2000 FEET IN CONE 3 SHOOT WITH 3 RADS

4 1000 FEET HE'S NOW GETTING 2-RAD LEAD

5 500 FEET HALF A RAD LEAD AND POUR IT ON



DEFLECTION CHANGES IF GUNNER'S PLANE SPEEDS UP, SLOWS DOWN

THE FUNDAMENTAL idea behind position firing is that firing from a rear seat or turret at an attacking fighter flying a pursuit curve attack is in principle the same as firing from any moving platform at a stationary target. When fired from a plane or other moving platform, the bullet will be carried forward because of the motion of the platform.

For this reason, the cardinal rule of position firing is to aim along the line of apparent motion of the attacking plane, which is a point between this plane and the tail of the gunner's plane. Since the most dangerous fighter attack is when he is in a pursuit curve, position firing is used.

Deflections for position firing have been computed mathematically for the gunner, based primarily on muzzle velocity, speed of own plane and position of target off fore and aft axis of the gunner's plane. Deflections are maximum when the fighter is abeam and nil when it is dead ahead or astern.

Deflections commonly are figured on a speed of 200 knots for the gunner's plane. Printed lower on this page are modified deflections used when his plane is traveling faster or slower than that. For instance, if the attacker is coming in straight abeam, he will be given a 3-rad deflection toward the tail of the gunner's plane. If this plane is traveling 150 knots instead of 200 the deflection would be 2.5 rads.

Gunners have to learn to spot the angle-off of the target or the cone on which the fighter is positioned, either ahead of or behind their own plane. He must know immediately the fore-aft axis of his plane. By knowing this, he can figure in which cone the attacker is located and how many rads deflection to allow. This has to be done instantaneously, because a fighter takes only a few seconds in his attack.

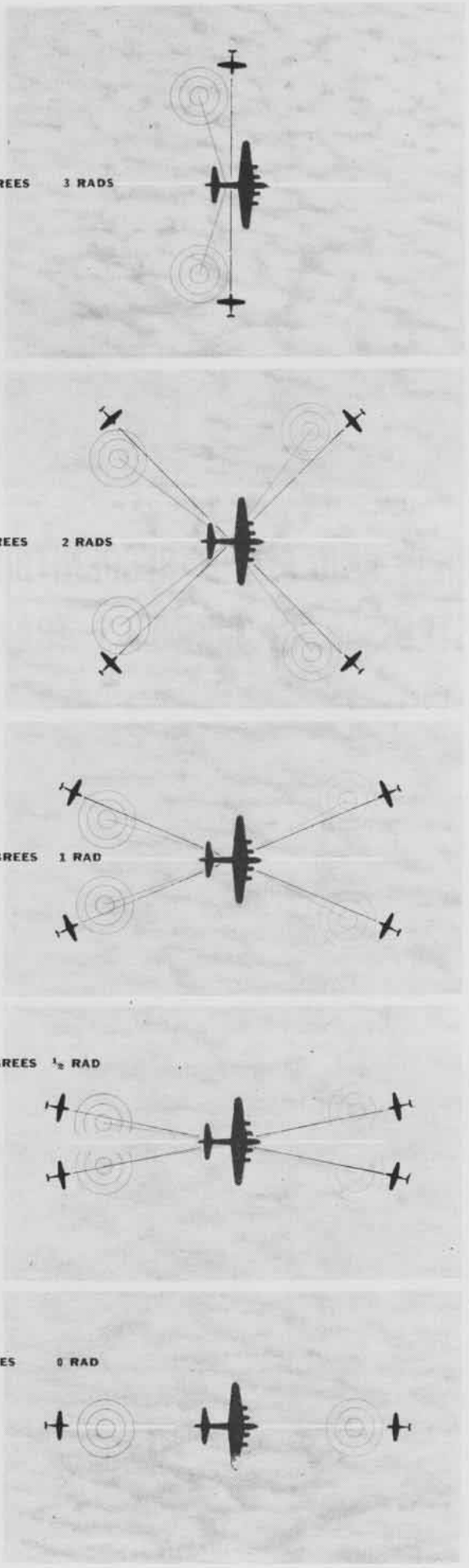
Once deflections are learned for any bomber speed, the gunner's problems then are to spot the angle-off, apply the deflection as the fighter gets in range and modify the deflection as the attack is pressed home. This sounds easier than it is, and the gunner who gets the kills is the man who does this without having to stop and figure it all out on paper.

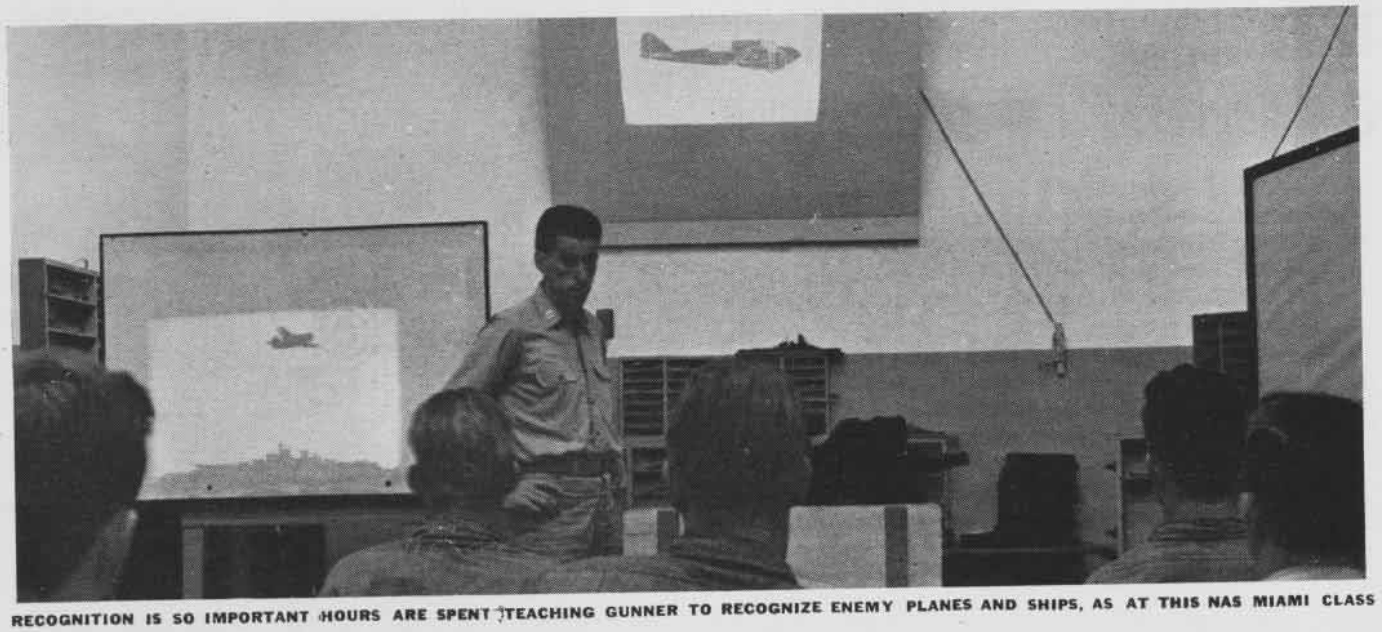
AT ALL POSITIONS, the point of aim always is on the target's line of aparent motion, between the fighter and the tail of the gunner's plane.

Because the deflections mentioned heretofore are figured for a bomber or other multi-place plane going 200 knots, the following table is given to show deflections when the plane is going slower or faster than that. Deflections follow:

Speed	Cone 3—90°	Cone 2—45°	Cone 1—22.5°	Cone ½—11.25°
150 knots	2 heavy	1.5 heavy	1	½
200 knots	3.0	2.0 heavy	1 heavy	½ heavy
250 knots	3.5	3.0	1.5	1

At the bottom of the opposite page are five illustrations showing progressively how the deflection is lessened as the attacker closes in along the pursuit curve, keeping his nose always pointed ahead of the gunner's plane so that his bullets will intersect its line of flight. The illustration on this page shows in another form how deflections in rads are applied in beating off fighter attacks, no matter from what quarter the enemy is approaching. The four top pictures show deflections in the four cones. If the attacker is straight ahead or dead astern, no deflection is required, but a nose or tail gunner seldom gets a shot like that. Battle reports indicate there is no favorite angle of attack, so a gunner should be proficient in beating them off in all cones.





RECOGNITION IS SO IMPORTANT HOURS ARE SPENT TEACHING GUNNER TO RECOGNIZE ENEMY PLANES AND SHIPS, AS AT THIS NAS MIAMI CLASS

SHIP AND PLANE RECOGNITION IS STRESSED IN GUNNER'S TRAINING

BEING A CRACK gunner, able to get 30 percent hits on a "rabbit" flag or 25 percent on a tow sleeve is laudable, but without the ability to tell an enemy plane from a friendly one this ability is dangerous.

That is why so much time is devoted to recognition training at every gunnery school run by the Navy. The standard syllabus for gunnery training calls for 23 hours of work in this phase, second only to the time put in on 3-A-2 trainers and more time than is allotted to any other single phase.

Both ships and airplanes are taught because a rear gunner will be shooting at both in action. Poor recognition can be responsible for such melees as the recent fight between B-25's, PT boats and fighter planes attacking each other in the Pacific, with disastrous results.

Besides recognizing the plane type, the student must know the wing span of enemy planes to the nearest basic measures—35, 52½ and 70 feet—and know that a fuselage usually is about three-quarters of the wing span. Wing span and lengths of U. S. and Allied planes are not stressed. They must know the nationality, type and class name of surface craft, except destroyer class names.

Because of the wide variety of enemy planes, some gunnery schools' recognition rooms have built up large files of slides showing these planes from every angle. All types of projectors are used to flash silhouettes on screens, allowing the students from a fifth to a twenty-fifth of a second to identify them. In action, gunners can not refer to books.

BEFORE REACHING gunnery schools, most students have had some recognition in technical training. Because this ability to recognize must be kept constantly at work, the training is stressed all through gunnery's five-weeks course and recurrently thereafter. Plane recognition is given the greater emphasis since most free gunners will be shooting at them rather than at ships. Recognition of vessels is more important for gunners on scouting missions, so that strength and make-up of enemy formations can be reported back to the fleet. Accuracy in spotting is vital.

SHIP RECOGNITION, WHILE NOT SO VITAL AS AIRCRAFT, MUST BE LEARNED SO SEARCH MISSION GUNNER CAN REPORT ENEMY CONCENTRATION

STUDENT FIRES 6,500 ROUNDS IN MACHINE GUNS DURING TRAINING

IN EARLIER days of gunnery training, shooting of skeet with shoulder-held shotguns was stressed heavily. Later trends have been toward installing shotguns in turrets or on mounts with spade grips so the student gets more realistic practice in tracking as well as figuring lead.

Once he learns to strip his gun, correct malfunctions and use sights, he begins his firing with shotguns. During his time at gunnery school, he will fire about 400 rounds with shotguns and as high as 6,500 rounds with .30 and .50 cal. machine guns.

On the free gun performance range he clears malfunctions, boresights his gun and performs field stripping, then fires the gun to see that he did the work correctly. From this he graduates to machine guns with spade grips, firing at bullseye targets to give him practice in holding the gun to counteract its tendency to rise.

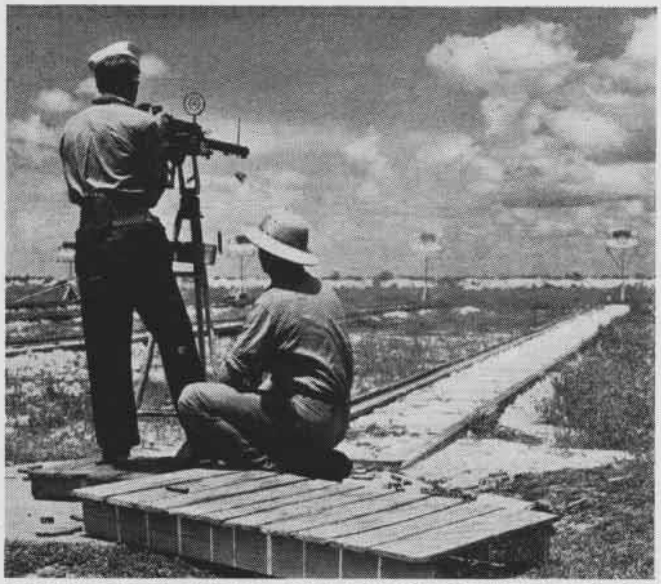
The next step in his progressive training, after firing at fixed targets, is moving targets. Printer's ink or paint, daubed on noses of bullets, enable the men to keep score of hits on white cloth flags which speed around circular tracks on an electric "rabbit" or railroad cart. Turrets also are mounted on trucks and while in motion guns are fired at fixed targets.

Men destined for TBF squadrons fire from regular Grumman turrets. They are trained in turret maintenance so they can make minor repairs while in the air. Both hydraulic and electric turrets are covered and the men taught intricacies of their operation and upkeep, such as resetting of circuit breakers and thermo switches, checking for hydraulic leaks, adjusting fire interrupters and checking switches and solenoids. An aircrewman's job includes not only gunnery, but helping to keep his plane in fighting trim.

SOME GUNNERY schools are giving their advanced students practice in air-to-air firing and strafing, something they get in greater quantity after they are assigned to operational training squadrons to become aircrewmen. The free gunnery school at Hollywood specializes in training men for TBF squadrons; the Yellow Water school in multi-engine plane gunners, and Purcell in general free gunners.

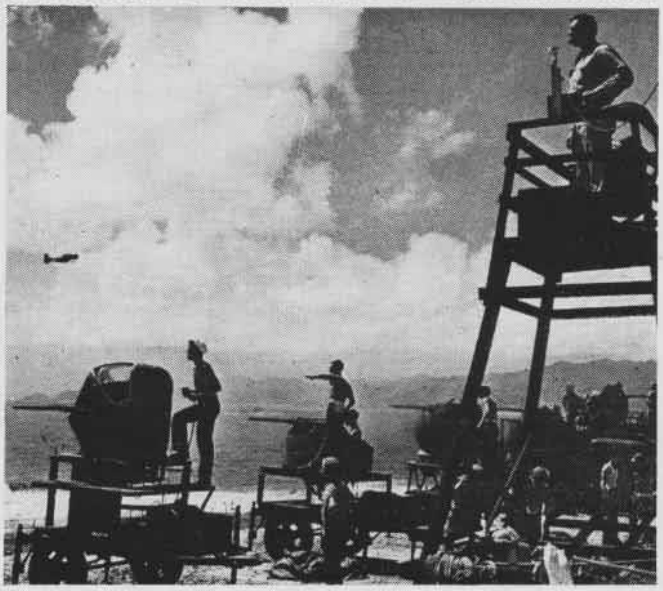
Besides their gunnery, students at schools spend many hours in the radio rooms keeping their code and blinker knowledge sharpened. Although they learned their signal flags and code earlier in their Navy training, constant practice is necessary to keep from getting rusty. They get sufficient practice to carry out current operational training orders. At Hollywood gunnery school, for instance, turret gunners are linked with their instructors by headsets and keep brushed up on their communications while they are firing at targets.

TBF gunners also must know how to handle bombs and torpedoes. They learn how to load the many different types, how to handle hoists, bomb carts, shackles and fuses. In addition to general pyrotechnics, they must know how to use intervalometers and station distributors which control the release of bombs. He selects fuses and different type detonators for various missions. Besides this, the gunner also had other things to occupy his time, such as belting ammunition, learning correct range procedure, reading up on air combat information and checking out in the use of oxygen equipment. Each day he spends half an hour to an hour in physical exercise, athletics or military drill to keep him in trim for the job when he joins up with the fleet.



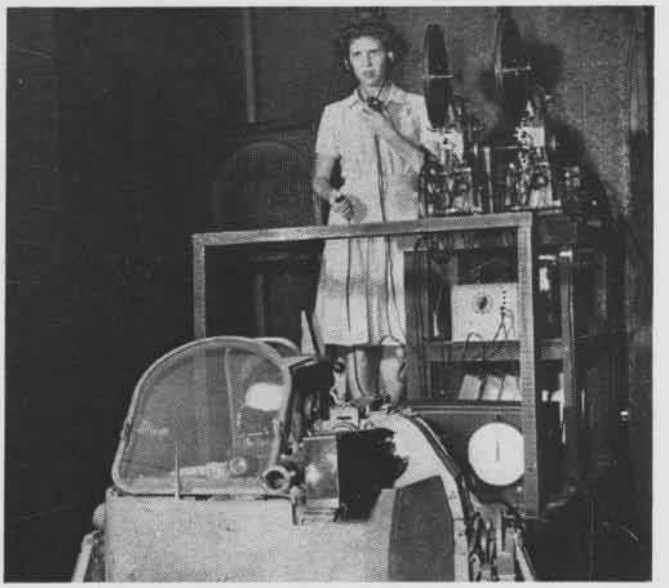
GUNNERY SCHOOL STUDENT DOES FIRST FIRING WITH FIXED GUN

WAVE INSTRUCTS TBF TURRET GUNNER ON MOVING TARGET RANGE



KANEOHE GUNNERS FIRE AT TOWED SLEEVES OVER THE PACIFIC

Range estimation device, equipped with movable mirrors, gives student practice in using ringsight to figure attacker's range



Gunner polishes up on position firing in 3-A-2 ttraining device operated by WAVE. This student operates from Grumman turret

STUDENT USES TRAINING DEVICES ALONG WITH ACTUAL RANGE FIRING

TRAINING AIDS of various kinds, developed since the war started, are widely used throughout training of aerial gunners to make learning easier and teach basic skills.

One of the most widely used and best known synthetic training devices developed by BuAer's Special Devices Division is the 3-A-2 trainer. The gunner in his turret or with a spade grip "gun" which projects a small beam of light on the screen gets excellent practice in tracking.

Another version of this device also has been developed—the 3-A-20, in which a photoelectric cell instead of the WAVE operator counts the "hits" on the enemy plane. A new device features a 180° semi-cylindrical screen which gives the gunner in the turret wider tracking experience.

Other training aids used at gunnery schools include range estimating devices, panoramic trainer, spotlight animator, self-assessing gun camera and many training films. Larger schools also have outdoor range estimation installations with wooden guns and ringsights. Students aim the guns at approaching Piper *Cub* or Stearman biplanes with approximate 35-ft. wingspan and start "firing" when in range.

Training device designed primarily to teach a student automatic operation of his turret and tracking is the spotlight animator. Simpler in construction, this device projects a small roving dot of light on a screen in front of the gunner, who operates his turret so that the light beam from his gun superimposes on the moving dot to register a hit.

SELF-ASSESSING cameras installed in waistgun mount positions or in turrets help the gunner tell how accurate his sighting is on a plane making a pursuit curve attack on him. Pictures taken during dry firing give graphic proof of whether the gunner is using correct deflection and aim.

Spotlight animator projects spot of light on wall or screen so that gunner can learn automatic manipulation of turret, sight

Gunners at NAGS Hollywood also learn how to load torpedoes and bombs in TBF bomb bay. Shooting is only one of their many jobs

IN THE DRINK

There Is No Need For Dunking To Be Fatal

OUT OF A WAR *now moving toward the close of its third year has come a vast array of experience data dealing with phases of flying incident to combat. No overall standard practice for dunking can be drawn from these data but certain guides may prove to be helpful.*

No one item of rescue equipment can be singled out as being most essential. There is too wide a diversity of pilot opinion and circumstance.

An F6F pilot was forced down June 29 by propeller failure and was recued at night after 14 hours on a raft. He said: "The waterproof flashlight did the trick." But nine days earlier an F6F3 was shot down while attacking the Jap Fleet and was rescued at night by a destroyer. In this pilot's opinion the whistle proved best as a rescue device.

On the other hand, the entire crew of a B-29 which crashed in the Far East on June 8 would swear there is no rescue aid equal to a mirror. Planes were on the wrong track searching 10 miles from them and it looked hopeless until a crewman broke out a signal mirror. In moments a *Catalina* saw the gleam and came to them.

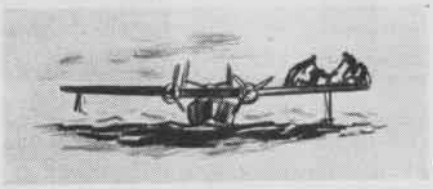
Adding point to the contention of those who regard waterproof flashlights as No. 1 rescue item is the report of one squadron on a catapult launching before dawn, which failed. An F6F went

over the side and the pilot was heard shouting: "Here I am," as the ship swept past. The search was prolonged but not successful. Before his take-off the pilot gave a ready signal by hand. He had no light or it was out of order.

There are a multitude of reports in which Very's pistols, dye markers, smoke bombs, tracer ammunition and radio have played a leading role in saving life at sea. There are others where ingenuity was the deciding factor to a large extent. Such was the case when a PBM-3D made a forced landing 300 miles offshore on July 31. There was a grinding rip as it hit. The port wing float carried away in a few moments.

Listing on the port side, the plane would have sunk had not four of the men scrambled out on a starboard wing.

Rafts were placed in readiness and when aircraft were sighted all of the usual signaling devices were used. When the castaways failed to attract a plane with voice and recognition signals they broke out a two foot square of alclad in the emergency repair kit and using it as a reflector, caught the pilot's eye. He circled and left. Later when other planes were sighted they tried to limber up the Gibson Girl but



the aerial kite broke loose. The resourceful crew then rigged up an emergency wire aerial and established communication. Just 24 hours after they were dunked, rescuers arrived. Very's pistol, mirror, smoke bombs and radio had all been used but ingenuity played a leading role in saving them. Because of towing difficulty it was decided best to sink their big plane which was still floating. This was done by the destroyer.

Dunking Leads to Recommendations

Many recommendations, some doubtful, others excellent, have come out of these dunking reports. From VT-16 originated a suggestion that life raft containers be improved so they will not break away when pilots bail out. The squadron recommends also that a float and strong line be attached to the rafts to keep them afloat when uninflated.

Recommendation on life jacket uses came from a pilot who crashed June 17 while on convoy duty. All of the crew but the pilot bailed out at 2,500 ft. They were in the water some hours before a rescue was made. Their suggestions: that straps of life jacket be loose so that subsequent inflation will not bind; that clothing be retained in order to protect the body fully from abrasion by the jacket; that only one compartment of jacket be inflated at first, provided it will keep wearer afloat, thus facilitating swimming.

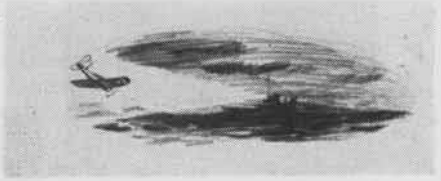
Reports from Fighting Squadron No. 8 take up several phases of dunking by night. The police whistle was found best for locating downed personnel because it carries farther, is more directional and creates less emotional disturbances in the crew than yelling.

All flares or electric float-type lights should be recovered or destroyed as

soon as rescue is made, the squadron recommends, to prevent other destroyers from wasting time searching in areas where rescue has already been made. It was found moving searchlights could be more readily seen by personnel in the water but these should be kept at an elevation high enough to avoid blinding those pilots coming in.

Searchlight Should Be Kept Into Wind

Destroyers found it easier to keep track of downed personnel ahead of the ship and difficult when planes hit the water on either side. VF-8 recommends, too, that destroyers acting as plane-guard be permitted to train 18 in. lights into the wind. Pilots unable to reach carriers can land down the beam path

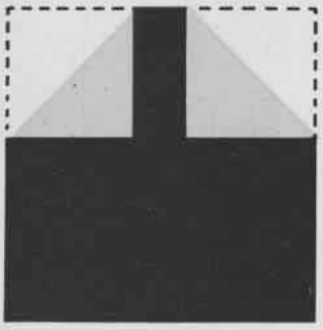


easily and by this means are more quickly found and rescued.

Out of the mass of dunking data and the variety of recommendations comes a fact which is irrefutable. The pilot who knows his rescue equipment has by far the best chance of survival. The careful pilot familiarizes himself with every item and knows just where it can be found. By so doing he avoids the unhappy experience of one fighter pilot who had spent many uncomfortable hours in the water before rescue, lamenting the fact that some of the equipment he needed most had been lost when he ditched the plane. At last the rescue ship hove into sight and the brine-soaked pilot came thankfully aboard. Removing gear he found on his back the articles he had needed most.

Survivors Use Life Raft Sails to Convey Signals

LAND: NEED QUININE OR ATABRINE
SEA: NEED SUN COVER

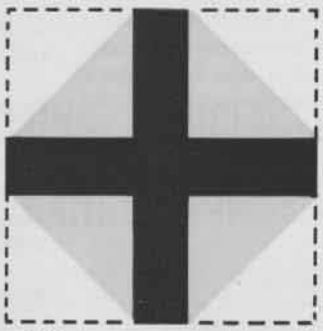


LAND: NEED WARM CLOTHING
SEA: NEED EXPOSURE SUIT OR CLOTHING INDICATED

LAND & SEA PLANE IS FLYABLE. NEED TOOLS

SEA: NEED EQUIPMENT AS INDICATED. SIGNALS FOLLOW

LAND: NEED GAS AND OIL. PLANE IS FLYABLE



LAND & SEA NEED MEDICAL ATTENTION

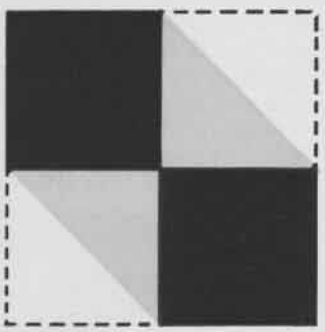
LAND & SEA NEED FIRST AID SUPPLIES

LAND & SEA NEED FOOD AND WATER

LAND: INDICATE DIRECTION OF NEAREST CIVILIZATION
SEA: INDICATE DIRECTION OF RESCUE CRAFT

LAND: SHOULD WE WAIT FOR RESCUE PLANE?
SEA: NOTIFY RESCUE AGENCY OF MY POSITION

LAND & SEA OK TO LAND. ARROW SHOWS LANDING DIRECTION



LAND & SEA DO NOT ATTEMPT LANDING

THE ADVANTAGE of panel emergency signals by men on life rafts or on beaches awaiting rescue is obvious. Against the neutral landscape or beach, the paulin is highly visible by contrast. The records in BuAer have many reports of misunderstood hand signals and uninformed pilots dropping the wrong item of survival equipment: Food when the plane is flyable and gas and oil are needed; medical supplies when the life raft is sinking for lack of patching.

There also are a large variety of reported rescue failures resulting from lack of information that could have been signalled from the ground; Seaplanes plowing open their hulls on coral reefs; pilots landing their planes in what appeared to be a level woodland meadow to find themselves nosed down in a marshy area covered with swamp grass—just another survivor to be rescued.

Meanings for the 13 panels were chosen with care as to the most important and most frequently occurring needs of survivors on land or sea. Intelligently used, they should be responsible for saving of lives and equipment.

HAVE ABANDONED PLANE
LAND ...WALKING
SEA } THIS DIRECTION
...DRIFTING

Spread over life raft, the sail signal directs the plane overhead to notify a rescue agency of its position and dispatch aid

Blue triangle signal notifies the search plane that the men on the raft need equipment which they will indicate by signaling

EMERGENCY SIGNALING

WITHOUT INCREASING the raft weight by an ounce, and by adding only a small piece of waterproof fabric to standard multi-place raft equipage, BuAer has incorporated a valuable means of survivor-to-plane communication.

The life raft paulin, already in use as a sail, a water catcher, and as a protection against sun and chill of night, is employed for this purpose. Yellow on one side and blue on the reverse, the paulin can be folded to represent the variety of signal flag patterns illustrated on these pages.

The fabric page of signals sewed to the paulin is included as standard life raft equipage along with raft sails or paulins now under procurement, and is being forwarded to aviation activities to sew on raft sails already in service. Likewise, copies of the signals are being provided for pilots' plotting board and P.P.C.'s brief case.

Except for the blue triangular panel, "Signals Follow," the same signals also are used by the U. S. Army Air Force.

CIRCLING AIRCRAFT acknowledge the signals from survivors on the ground or in a life raft by a series of shallow zooms. The signal should not be changed too quickly.

The need for such a highly visible communication signal is dramatized by the plight of the Marine pilot who was forced to bail out over the Arizona desert (NANews, 1 Aug. 1944). Planes flew over him for four days, but failed to sight him. He had no signaling equipment, so he made contact and established communication with search aircraft by digging his initials 4′ wide and 25′ long in the desert sand. Then he wrote in similar letters, "GOING WEST."

Spread on beach sands, this signal tells that men need quinine or atrabrine tablets

If their plane is flyable, the men signal this way to ask that gas and oil be sent

This easily read cross of blue tells that the survivors are in need of medical aid

SQUADRON NOTES

Black Cats Come Back. The original "Black Cat" squadron, first Navy group to fly *Catalinas* painted pitch black, has returned to the United States after its second tour in the Pacific with an enviable record in night spotting for artillery, rescue and anti-submarine work. VP-12, as the "Black Cats" are designated, did its best spotting on Bougainville during March and also rescued 17 downed pilots that month. A successful daylight raid on an enemy held island in the Solomons was only one of this squadron's more notable exploits.

Outwit Jap Sneakers. In an effort to conserve their aircraft on islands guarding approaches to the Empire and Philippines, the Japs have been taking off for parts unknown at the first word of Allied attack and hiding in the clouds until it was over. Afterwards the Nip pilots have returned and made ready for sneak attacks on our carrier task forces. When a huge flight of war planes from Task Force 58 bore down on a Nip airfield along the west coast of Tinian, the Japs got an unpleasant surprise. After the war planes had left 14 Jap bombers and two Zeros came leisurely home but had hardly touched earth when four *Hellcats* of Fighting 28, which had been hiding in the clouds, came down on them with guns blazing. When they left no Jap planes were flyable and many Nip pilots had joined "honorable ancestors."

Bag 25 Japs in Day. In one day's action over the Volcano Islands, only 700 miles from the Japanese mainland, a Navy fighter squadron known as the "Devil Cats" shot down 25 Jap planes at a cost of only three Navy pilots. In the first battle of the day seven of the "Devil Cats" bagged two Japs each while three more members of the squadron each dropped a single. Later eight "Devil Cats" intercepted a force of 20 Jap bombers and fighters, shooting down four bombers and four fighters.

50 Cals Sink 'Can.' Although Navy Grumman *Hellcat* fighters have been the terror of enemy shipping for a long time, it remained for the pilots of Fighting Squadron 51 and Fighting Squadron 13 to prove their .50 cal. machine guns were actually capable of sinking a destroyer.

In the first instance of "David slaying Goliath," 16 *Hellcats* of Fighting Squadron 13 operating from the Fast Carrier Task Forces had been assigned to escort bombers in an attack on a Jap convoy. Since planes were over the convoy and ack-ack was moderate, eight *Hellcats* were ordered to attack a destroyer

Two stafing attacks were made. On the second run the *Hellcats* strafed both decks and the hull of the destroyer at the water line. Then fires broke out. The destroyer exploded and sank in a cloud of steam and white smoke.

In the meantime the eight remaining fighters went after another Jap destroyer and as they pulled out of their first strafing run two terrific explosions occurred hurling parts of the Jap's superstructure high in the air. The destroyer sank in a few moments.

Fighting 51's fighters got another Jap destroyer some days earlier southwest of the Marianas. Sighting the Jap while on patrol the four *Hellcats* launched their attack. After the sixth strafing run the enemy destroyer blew up with a terrific explosion and disintegrated.

So Solly, My Mistake. While out flying with a South Pacific squadron on a photographic mission, the pilot of an F6F sighted a Japanese *Hamp* fighter 2,000 feet above him. The Jap waggled his wings in friendly fashion and began a slow circle apparently to assist the Navy pilot in joining up. Appreciative of the Jap's fine attitude, the Navy pilot waggled his wings back with equal friendliness. Climbing to range he opened fire and a badly mistaken son of the Rising Sun cometed into the Pacific.

Only a Single Plane Lost. Although VB-142, which returned recently from the Pacific area, made 325 bombing sorties during its seven month tour of duty, only one plane was lost by the squadron. In 4,901 hours of combat flying the squadron attacked 11 Jap ships, damaging six and sinking five. Playing an effective part in wresting control of the Marshall Islands from the Japs, VB-142 made night attacks on Mille Island airfield while our forces were moving in upon nearby Kwajalein. And just before the Marshall invasion the squadron took the photographs of Majuro which were later used by landing parties. A major portion of the squadrons attacks were of the hazardous low-level variety.

Quartet Scores Heavily. Four Navy *Avenger* torpedo bombers of VT-31 were after big game when they began hunting for the Jap fleet in the Pacific not long ago. They had flown more than 200 miles before catching their first glimpse of the Imperial fleet. The quartet passed up a group of tankers and destroyers to fly on toward the main part of the fleet. In the face of murderous anti-aircraft fire and fighter opposition, the *Avengers* came in to score five direct hits on a 30,000-ton *Skokaku* class carrier and one hit on a 30,000-ton *Kongo* class battleship. Returning to Task Force 58, three of the *Avengers* made safe deck landings while the fourth made a water landing. The entire crew of this *Avenger* was rescued from their raft two hours later.

Jap Downed In Second. Warned of approaching Jap torpedo planes, a CVE off the Marianas started sending up *Wildcats* to serve as interceptors. One lieutenant charged his guns as he left the deck and no sooner in the air than a Jap flew across the carrier's path directly in front of him. Wheels and flaps were still down but the Navy pilot banked sharply and fired one burst. The Jap zoomed up and crashed into the sea. There was no stop-watch but it all happened in a very few seconds.

VP-72 Saves 69 Men. During eight months of duty in the Pacific area, VP-72 which is now back for a rest, was instrumental in rescuing 69 downed Navy, Army and Marine Corps airmen. Of that number, 22 were rescued in 10 different open sea landings while the squadron rescued the others by directing surface craft to the scene. Dumbo duty was not the only function of this *Catalina* squadron which had its share of search, bombing, night-harassing and torpedo-dropping missions. Heightening its record is the fact that VP-72 lost not one man in eight months.

Pilot Uses His Head. When his F6F was shot up while he was attacking part of the Jap fleet, the pilot found himself snugly lodged between the horns of a dilemma. He was in a flat spin at 15,000 feet, directly above the Japs and had his choice of parachuting down to the enemy or trying to limp back to the carrier. A rudder cable and aileron cable had been shot out, two-thirds of the starboard stabilizer had buckled, part of the port flipper was gone and the cockpit cover was blacked out by spattering fluid. The Navy pilot made his choice and began fighting the controls. At 10,000' he pulled out of the spin and discovered the fluid on his windshield was not oil but hydraulic fluid. With radio equipment also shot out, he began hunting a carrier. Following the lights of other planes, he found a flat-top, touched deck and smashed into the barrier at 130 mph. The F6F turned turtle but when deck crews lifted the fuselage the pilot dropped out on his head. A minor head bruise was his only injury. "In a situation such as this," he commented, "a pilot should always use his head."

Typographical error: NANEWS' Oct. 1 issue credited Air Group Five with 59 Jap planes in aerial combat, instead of 95, which is correct.—*Ed.*

PUBLICATIONS

The following Flight Safety Bulletins, Aviation Circular Letters, Technical Orders and Technical Notes have been issued recently by DCNO(Air). Copies are available on request to Publications Section, Bureau of Aeronautics.

FLIGHT SAFETY BULLETINS

24-44 *Oxygen—Orders Regarding use of.*
25-44 *How to Regain Fuel Suction.*
26-44 *Model F4U-1, F3A-1, FG-1 Airplanes Carbon Monoxide Contamination—Prevention of in Pilot's Cockpit.*
27-44 *Model F4U-F3A-FG Airplanes Wingfold Mechanism—Instructions to Prevent Folding of Wings in Flight.*
28-44 *Automotive Equipment on Flying Fields.*
30-44 *TBF-TBM Airplanes—Permissible Maneuvers.*
31-44 *Single Engine Operation.*

AVIATION CIRCULAR LETTERS

86-44 *Aircraft Engineering Drawings & Technical Data Reproduced on 35mm Microfilm—Availability of.*
87-44 *Model Designation of Naval Air-craft*
88-44 *Regulations Governing Technicians and Other Civilians Accredited to Perform Services or Take Passage in Naval Vessels or Enter Combat Areas under Naval Control.*
89-44 *Certain Model Aircraft—Maintenance Policy*
90-44 *Aeronautical Technical Publications—Distribution of.*
91-44 *Class 88 Aircraft Instruments—Designation of Overhaul Bases for.*
92-44 *Manual for Historical Officers, NavAer 00-25Q-26; Modification of.*
93-44 *Aircraft Allocated to Foreign Governments by the Navy Department Under Defense Aid Procedure—Repair of.*
94-44 *Combat Aircrewman's Gunnery Manual, Restricted, (OPNAV 33-40) (NavAer 00-80S-40).*
95-44 *Pilot and Co-pilot Signals.*

TECHNICAL ORDERS

D-44 (Conf.) *Modification of R/2/ARR-3 Radio —Receiver Equipment.*
112-44 *Unnecessary Use of Life Raft Repair Cements.*
113-44 *Stalls and Spins.*
114-44 *Attachment of Pararaft Kit to Quick Attachable Chest Parachute.*
115-44 *Back Pad Kits—Modification of.*
116-44 *Additional Oxygen Equipment for VJ-VR Type Airplanes.*
117-44 *Life Vests—CO_2 Actuating Lever Lanyard—Modification of.*
118-44 *Aircraft Radio AN/APN-4 Antenna Impedance Matching Unit, Installation of.*
119-44 *Multi-place Life Rafts and Life Raft Equipment—Description, Inspection, Maintenance.*
120-44 *Model RY-1 and RY-2 Airplanes—Restrictions and Permissible Maneuvers.*
121-44 *Model RY-3 Airplanes—Restrictions and Permissible Maneuvers.*
122-44 *Model PB4Y-1 Airplanes—Restrictions and Permissible Maneuvers.*
123-44 *Model PB4Y-2 Airplanes—Restrictions and Permissible Maneuvers.*

TECHNICAL NOTES

G-44 (Conf.) *MX-137/A and MX-138/A Corner Reflectors for Life Rafts.*
74-44 *Parachute and Harness Quick Attachable Seat Type.*
75-44 *Aircraft Radio—Headsets with new ANB-H-1 Headphones.*
76-44 *Antenna AN-148A—Failure of.*
77-44 *ARB Airborne Receiving Equipment—Control Boxes, Operation of.*
78-44 *AN/ARC-5 VHF Radio Equipment—Tuning Precautions to be Taken.*
79-44 *Army 274 N and Navy ARA Radio Range Receiver (180-550 kc.) Selectivity Adjustment.*
80-44 *Caliber .50 Bam Guns— Use of Cartridge Stops with Mk. 45, 90, 90X, 90XX and 180 Expended Link Ejection Heads.*
81-44 *AAF Voltage Regulator Base—Installation of Improved Vibration Mount.*
82-44 *Manual Closing of Reverse-Current Cutout in Flight.*
83-44 *Army-Navy Standard Turn, Bank Indicators*
84-44 *Life Raft Manifold Testing Device.*
85-44 *Replacement of Mounting Flange-Bolts on GE and Auto-Lite Generators.*
86-44 *Extinguishing of Engine Fires in Flight.*
87-44 *Aircraft Radio *AN/ARR-2 ( ) Equipment Electrolytic Condensers, Replacement of.*

PILOTS RATE THESE—

ONE new training sense pamphlet and an air navigation text, published by the Aviation Training Division, Office of the Chief of Naval Operations, are now ready for a wider distribution. They are:

Pilot Error Sense—There are so many dumb mistakes you can make in the Navy that they have been classified as to type and various rates have been established. Young naval aviators are eligible to strike for any and all of them. Just three things are necessary to make one or more of these rates: cockiness, carelessness, and poor judgment. If you have these qualifications you're ready to step out and strike for a rate. It's not too much to hope for to make Goon 1/c at the same time you qualify for Squashhead 2/c. You might even strike for Heel 3/c on the same flight. Deeds like this have been performed. Many of these rates can be made only in the Fleet. Some, like Chief Straggler, unfortunately are conferred only posthumously. Highest of all rates is Corpse 1/c. Break enough rules and regulations and you'll make that too. It's most permanent of all.

Air Navigation, Part 4—Navigation instruments deals with basic instruments used in air navigation. Those described are a miscellaneous group, consisting of instruments needed for chart work, flight computations, working triangles of velocity, establishing airspeed and altitude, obtaining drift, determining headings, taking visual and radio bearings, telling time, observing altitude of heavenly bodies, and identifying individual stars. Instruments treated are those basically necessary to air navigation. Familiarity with instruments is an essential part of air navigation. Nature of instruments is described.

USE THIS FORM TO ORDER PAMPHLETS

Regular distribution is in process. Coupon should be used for those whose copies may have gone astray.

TO: Office of the Chief of Naval Operations, Op-33-J11, Navy Dept., Washington 25, D. C.

SUBJECT: Pamphlets—Request for.

It is requested that copies of new pamphlets be sent as indicated to this activity.

COPIES	PAMPHLETS
.....	Pilot Error Sense
.....	Air Navigation Part 4

FROM (Unit Commander): .....

Delivery Address: .....

.....

Attn.: .....

Cut here

HURRICANE BILL WORKS

HIGH SEAS BREAK OVER SEAPLANE RAMP AT NAS NORFOLK; AIRCRAFT BETWEEN HANGARS SECURED IN ADVANCE FOR HURRICANE ESCAPED DAMAGE

Dispatch—COMINCH NOTES WITH PLEASURE EFFECTIVE STEPS TAKEN TO EVACUATE AIRCRAFT ALONG EASTERN SEABOARD PRIOR TO DESTRUCTIVE HURRICANE AFFECTING THIS AREA 14 SEPT. DISSEMINATION OF TIMELY AND ADEQUATE WEATHER ADVISORIES AND PROMPT ACTION BY ALL HANDS RESULTED IN MINIMUM DAMAGE TO AIRCRAFT.

All Naval Air Stations Ready When Storm Hit; Aircraft Escape Damage

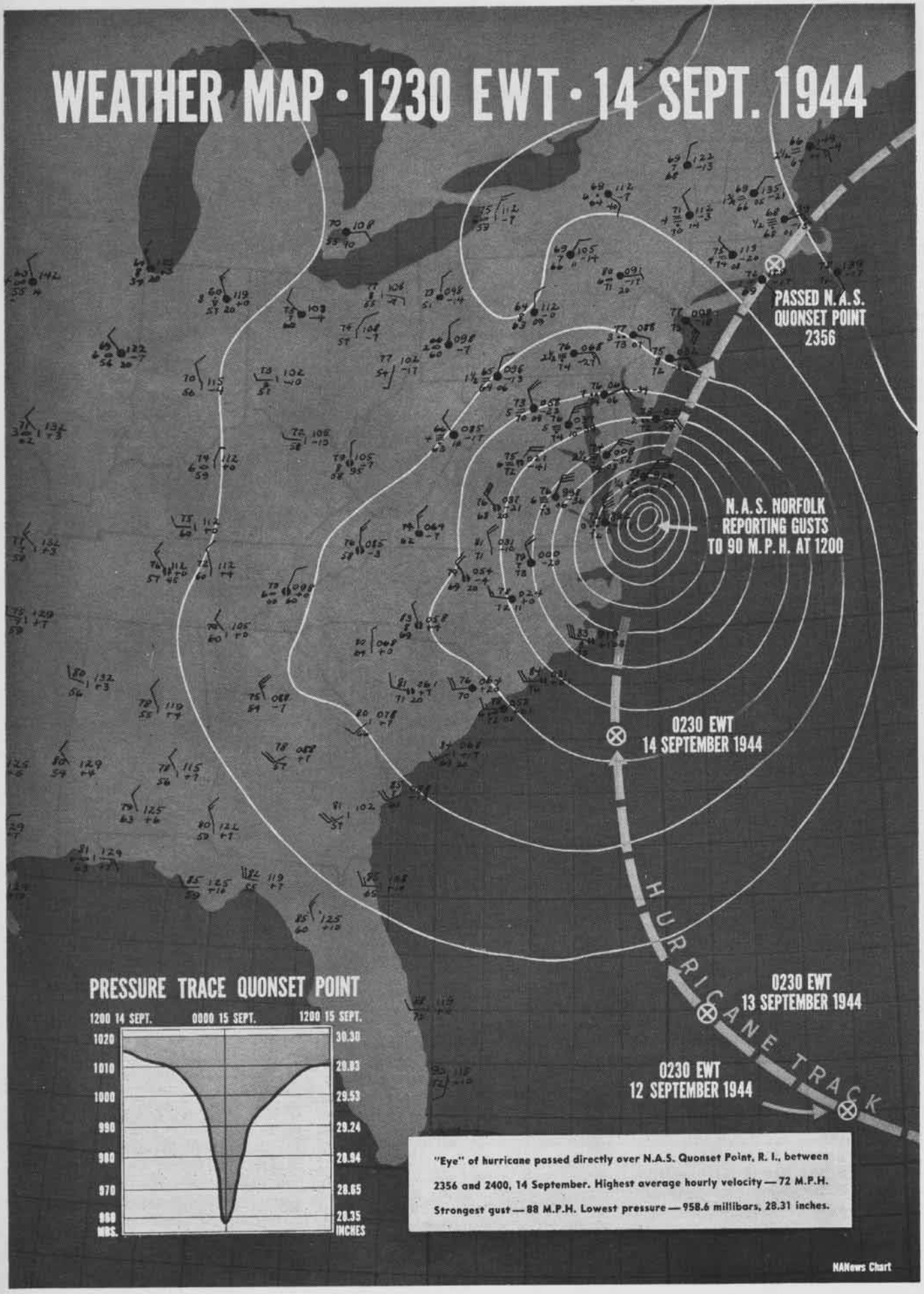
FIRST REPORTED from Puerto Rico at 1600, 8 Sept. as a tropical disturbance, this storm developed rapidly. It was soon realized that high pressure area along the eastern seaboard which would ordinarily serve as a buffer forcing hurricane away from the coast and off to sea was breaking down. Extrapolation of hurricane's path and that of a trough of low pressure moving eastward in the wake of dissipating high pressure area, showed the two would intersect near Norfolk. History of 1938 hurricane was to be repeated

As the storm moved slowly out of the Caribbean, the Navy's over-all hurricane program slipped smoothly into gear. Aerology, cooperating with the Army and U. S. Weather Bureau, studied data collected from stations and ships in the storm's path. To supplement this information planes were sent out to locate, study and report structure of the hurricane. All available facilities were employed to track the storm and forecast its developments.

All air stations in the storm's path went into action immediately on receipt of first hurricane warnings. From thereon, procedure outlined in joint Army-Navy hurricane evacuation plan (Ad Order 13-44) was carried out. Planes from stations in danger areas were flown out to refuge and alternate refuge airports west of the storm area. Where evacuation was impractical or unnecessary, hurricane tiedowns were effected.

Line Crews brace themselves against wind in excess of 85 mph, as they check special hurricane tiedowns of aircraft on field.

Secured In Accordance with established naval storm bill procedure, this Catalina went through hurricane at NAS Norfolk undamaged.


WEATHER MAP · 1230 EWT · 14 SEPT. 1944
PASSED N.A.S. QUONSET POINT 2356
N.A.S. NORFOLK REPORTING GUSTS TO 90 M.P.H. AT 1200
0230 EWT 14 SEPTEMBER 1944
0230 EWT 13 SEPTEMBER 1944
0230 EWT 12 SEPTEMBER 1944
HURRICANE TRACK
PRESSURE TRACE QUONSET POINT
1200 14 SEPT.
0000 15 SEPT.
1200 15 SEPT.
1020
1010
1000
990
980
970
960 MBS.
30.30
29.83
29.53
29.24
28.94
28.65
28.35 INCHES
"Eye" of hurricane passed directly over N.A.S. Quonset Point, R. I., between 2356 and 2400, 14 September. Highest average hourly velocity — 72 M.P.H. Strongest gust — 88 M.P.H. Lowest pressure — 958.6 millibars, 28.31 inches.
NANews Chart

EVASIVE ACTION

Antiaircraft in General. The principal mission of antiaircraft fire is to either destroy aircraft in the air, or by their action and presence, prevent them from accomplishing their mission, or reduce their effectiveness. Any weapon capable of firing into the air is a threat to aircraft. However, effective fire is primarily delivered from weapons especially designed for that purpose. They are heavy AA, automatic weapons, or MG.

Heavy AA. A battery is the smallest basic unit of Heavy AA. It consists of from 1 to 8 guns, usually 4, with such fire control instruments as are necessary for independent operation. These instruments may include height-finders, range-finders, radar, directors, and in short, any means whereby data is obtained and converted to firing data for the guns. The firing of these batteries is coordinated with that of other batteries, searchlights, and fighter aircraft, for the defense of an area.

Guns are strongly revetted, almost without exception, and are difficult to knock out unless a direct hit is registered. Defenses are normally set up so that maximum fire can be delivered while the aircraft is on its bomb run, and at any altitude from "on the deck" to maximum ceiling of the aircraft. Fire may be either seen or unseen, depending on the type of fire control instruments used. Fire may be continuously pointed or "tracking" fire, predicted concentration, or barrage fire.

The Antiaircraft Problem. In order that airmen may fully understand and evaluate enemy flak, a basic knowledge of antiaircraft fire is necessary. Regardless of the size of the guns employed, their ranges, methods of fire control, and other differences, there are certain elements that must be known or estimated before accurate fire can be expected.

Let's join the AA Gun Battery Commander and work out his problem with him. First he must have adequate warning that a plane is approaching, and from what direction. Assuming that his radar has not been jammed, his outposts are on the alert, and he knows the approximate bearing and distance away. As soon as his instruments pick up the target, he can determine the plane's position in the sky, in relation to his fire unit, at any particular time. This gives him his "Present Position Data." Then his troubles begin.

He now has to determine, by some means, where that airplane will be some seconds later, and so aim his guns, and cut his fuses, so that the projectiles will arrive at the same spot, at the same time as the airplane. In order to do this he must start assuming. He assumes that the airplane will fly at the same altitude, the same speed, and in the same direction for a given number of seconds. By this assumption he can say that the plane will be a certain point in the sky along a certain course, at a certain time. By any one of several means of computation, he can aim and fire his guns so that the projectiles will reach that point at the same time.

What happens if the plane does not conform to his predictions? No hits. The projectiles arrive as planned, but the plane is somewhere else. However, he does know this; the airplane must conform to these regulations, while it is on its bomb run. The longer the airplane conforms to rectilinear flight, the more aimed shots can be fired at it.

Under normal conditions, his instruments must track the target for about 10 seconds, before the data is smooth enough to give him correct firing data; add to this the time of flight for the projectile to get up to the point in the sky, which will vary from 2 to 30 seconds, depending on the distance from the gun, and it can be seen that the plane must conform, on an average of 25 seconds, before a hit can be obtained, and the hits will continue as long as the plane conforms, or is in range of the gun.

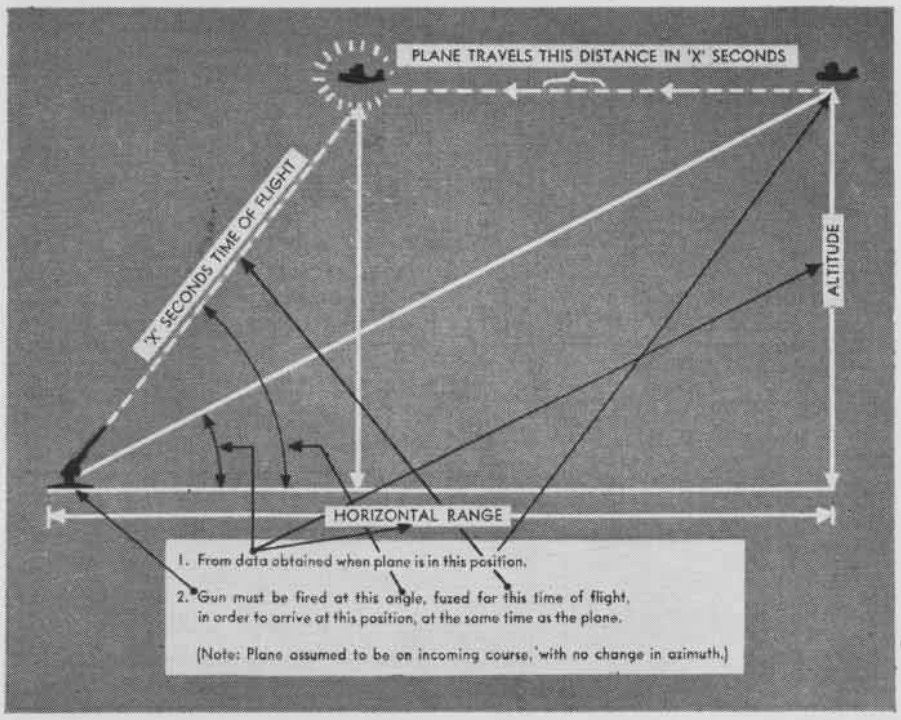
Now, let's leave the gun commander and become the target. Knowing what is needed in order to get a hit puts you in a position to upset the predictions. By using evasive action up until the time you actually start the bomb run, making the bomb run as short as possible, consistent with good bombing, and taking evasive action as soon as "bombs away," you can reduce his effective fire to about 1/3 of your bomb run.

Take these two facts with you:

a. Accurate "tracking fire" is dependent on your aircraft flying rectilinear flight.

b. Fire, either accurate or inaccurate, can be expected if you are flying anywhere within range of antiaircraft guns. There are no "blind spots" in antiaircraft fire.

(From an AAF Training Intelligence Report)



GUNNER FIGURES AIMING POINT AFTER ESTIMATING SPEED, DIRECTION AND ALTITUDE OF PLANE

Corpsmen Join Dumbo Crew

Catalina Saves Survivors of B-25

Adding a specially trained hospital corpsman to the regular crew of each *Catalina* assigned to Dumbo rescue operations, is already paying big dividends in the Pacific. How six members of an Army *Mitchell* bomber, three of them injured, were rescued from open shark-infested waters off Nauru island is one recent illustration.

The *Catalina* was attracted to the downed airmen by smoke flares and by the fact that eight other Army planes were circling the raft. Although swells were heavy, the *Catalina* landed and the holes made in her hull by the impact were plugged with pencils, erasers, rags and anything handy.

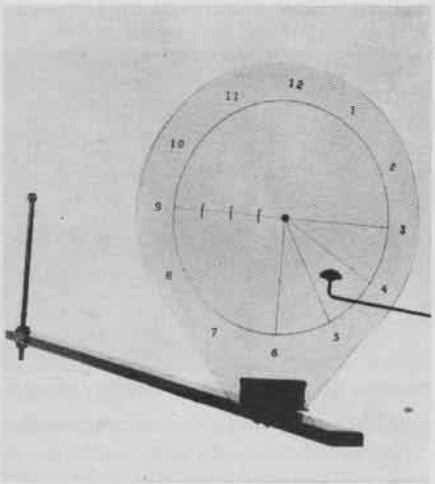
The chief pharmacist's mate assigned to the *Catalina* crew saw one of the castaways was in serious condition and quickly removed a portion of his plane's catwalk to fashion a stretcher. As soon as the uninjured Army men came aboard, he climbed into the raft, gave the most seriously injured man morphine and soon had him aboard.

In climbing aboard the *Catalina*, one of the rescued Army officers patted the boat affectionately and said with great relief: "Good old Navy. We're safe."

TECHNICALLY SPEAKING

Mock-up As Real Teaching Aid

NATTC MEMPHIS—A ring sight mock-up for demonstrating use of ring sights was developed at this station by an enlisted man. Use of this device has already substantially improved scores in that part of primary gunnery requiring use of ring sight. It is believed this mock-up has merit as a teaching aid for indoctrinating students in proper alignment and target positioning for different shots. The large size of this ring sight mock-up permits an entire group to follow an instructor's demonstrations.



LARGE SIZE PERMITS USE WITH ENTIRE CLASS

This shotgun training aid is made in the form of plastic enlarged ring sights to be used in connection with a pointer. Bar of mock-up device is made of channel aluminum 1¼"x½"x36" inverted and bolted together. Front sight is made of ¼" rod with ball soldered on one end, threads on bottom allow for adjustment. The sight is made of lucite 9½" in diameter with tongue to fasten to bar. Ring is 7¾" in diameter. Sight is fastened to bar by angle irons and bolts.

[DESIGNED BY A. C. ANDERSON, CSP (G)]

***BuAer Comment*—This is a pretty good gadget. Takes the thing off the blackboard and puts it in three dimensions.**

Wing Fixture Gains Stowage Space

NAS KANEOHE BAY—Any airplane wing of the basic illustrated design can be held in either of four different positions by a simple universal wing fixture, Dwg No. KB-E-94-C, which has been developed in the engineering division of the A&R department here. The fixture is bolted to wing root and by staggering fixtures slightly wings can be stored on edge to save space.

A two-caster dolly is used in conjunction with this fixture in moving a wing while it is mounted. A special three-caster stand with sling mounting which fits any wing contour is used to support the wing tip, preventing damage to it.

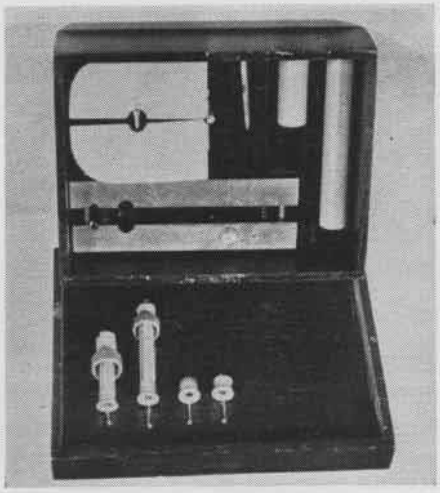
UNIVERSAL FIXTURE BOLTS TO THE WING ROOT

***BuAer Comment*—It is believed that by the use of this stand, repair work can be done more efficiently and less difficulty will be experienced in handling and moving. In addition, a minimum amount of floor space can be utilized for storage.**

Station Discards Rolling System

NAS NEW ORLEANS—Standard rolling fixtures for installing ferrules on aluminum shielded conduit were not producing desired results, so a metalsmith at this station has developed a new type of fixture that works successfully on an entirely different principle. By driving the ferrule collar into a tapered hole, diameter of collar is reduced, while the conduit is increased in diameter to give a tight fit.

Principal parts of the fixture are the reducing die, wood clamping block, wood driving punch, expanding pin and beading. The wood clamping block is in hinged halves. It has a slot for sawing conduit and a hole through which beading pin can be used. The metal reducing die, also in halves, is held together by guide pins and springs.



TAPERED HOLE IN DIE SHRINKS THE FERRULE

1. Wrap conduit with masking tape, insert in wood clamping block and secure in vise. Cut conduit through slot with No. 32 hacksaw blade. Remove from block, peel off the tape and insert in ferrule. Avoid fraying.

2. Place conduit in reducing die and reduce size of ferrule by driving it into tapered hole with wood driving pin.

3. Transfer conduit to other hole in reducing die, insert expanding pin and swedge conduit by tapping pin gently with wood driving punch until rim of ferrule is flat on the fixture.

4. For further security place expanding pin vertically in vise in inverted position with face of ferrule flat on vise jaws, and secure. Place wood clamping block on conduit with beading pin inserted on lower side and tap pin lightly while slowly rotating block around conduit.

This fixture was developed for installing type AN3050-4 ferrules on type NAF1150-4 braided conduit but a similar tool could be made to fit other types of conduit. Other activities can secure detailed data from NAS New Orleans.

[DESIGNED BY S. B. ZANSLER, AM2C]

***BuAer Comment*—This fixture appears to be a good idea for doing ferrule swaging of the small ¼" size for which it is designed. Requests for drawings and information, however, should be directed to NAS New Orleans rather than BuAer.**

Planning Board Reflects Line Work

NAS SEATTLE—Brain center of the new overhaul production line which recently has been set up in A&R at this station is a production planning board on which the progress of any plane along the line can be determined at a glance. Built to scale, the board shows the entire working area with scale models of each plane numbered and spotted as to position. The board is changed daily as planes move around the line through various stages of overhaul.

This *Catalina* overhaul facility serves a vast area of the Pacific, and that fact is emphasized by noting the former "hunting grounds" of some of the PBY's in for repairs. *Black Cat* planes from New Guinea rub shoulders with *Catalinas* just back from patrolling Aleutian waters. Fighters and other smaller craft also are processed in this department.

MODELS ARE MOVED AS PLANE GOES DOWN LINE

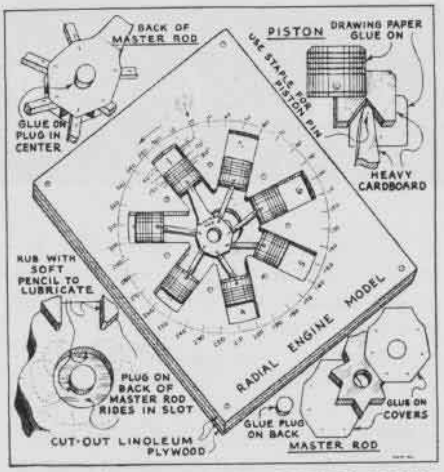
Production has been stepped up materially as a result of the new overhaul production line and new methods. Wings are removed to facilitate repairs and conserve working space. The measure also eliminates the hazard of scaffolding and work stands by bringing wings down to deck level. Catwalks have been manufactured to place around the tower, enabling more people to work on the hull at a time with greater comfort and safety.

[PLANNING BOARD DESIGN BY ENS. R. C. STULL]

▶*BuAer Comment*—Nearly all major stations have a status board which serves same purpose. This planning board could only be used practically at small stations, as a station having several hundred airplanes in process would require a large amount of man-hours merely to keep the models arranged in their respective positions.

Model Shows Engine's Principles

CASU-24—There are times when a simple working model will explain a mechanical motion better than one which tries to show too many things. Realizing this an enlisted man in the training department constructed from odds and ends of waste materials a small "waste basket engine model" to demonstrate operation of a radial engine.



BASIC MECHANICAL MOTION FEATURES SHOWN

Points of operation demonstrated include motion of the master rod, articulating rods and pistons, firing order of a radial engine and need for an odd number of cylinders, relation of the reciprocating motion of piston to the number of degrees of circular crankshaft travel, and elliptical motion of knuckle pins which causes a corresponding variation in the travel of pistons, making a compensated cam necessary in the magneto.

Made of scrap linoleum, cardboard, drawing paper, thin plywood, and paper staples, the model is 8″ x 10″. It is operated by using the top of a pencil for a crankpin and moving it with a circular motion. A few minutes' operation of this model has proved to be all that is required to gain a clear picture of how the major moving parts of the power section operate.

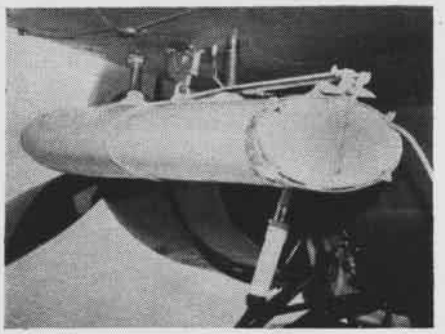
[DESIGNED BY WILLARD E. MOORE, ACMM(AA)]

▶*BuAer Comment*—This appears to be an easily made device which will serve a good purpose in acquainting personnel with some of the "innards" of a radial engine. For the more fortunate who have gone through various AMM schools it will provide a refresher course at the expense of only a small amount of work with waste.

VC94 Simplifies Streaming Target

VC-94—By adapting the conventional Mk 1 Mod 1 tow can to the wing of an FM-2 airplane, this squadron is successfully streaming the Mk-20 high speed aircraft target and completely eliminating difficulty and damage incident to streaming from the deck. The installation requires no modification to the plane, can be installed in three minutes and can be removed in less than a minute. The can is suspended from the droppable gas tank release.

Characteristics of this particular aircraft target make it difficult to stream from the deck. By the old free streaming method, the target tends to hug the deck as the plane takes off and the wear which results from this fault causes the target to tear apart at high speeds.



TORPEDO LANYARD ACTUATES TOW CAN RELEASE

Sway braces were made to steady the can while latched to the gas tank release. These easily are made from 1¼″ O.D. tubing of suitable thickness to permit threading on the forward brace. A nut, lock nut and fiber pad are provided for adjusting rigidity of the tow can after it has been latched and locked to the gas tank release. Both braces are 7½″ long from the upper end down to the top of the fork fitting the tow can.

A lock is inserted in the gas tank release to prevent it from dropping the ton can. It is a piece of flat metal one inch long shaped to fit the slot in the side of the release mechanism and held in place by pins at both ends.

A torpedo lanyard was used to connect slack in gas tank release cable to release cable on the tow can. When release handle is pulled in the cockpit, slack is taken up, pulling the torpedo lanyard and releasing target from the tow can. Targets do not interfere with flaps and have been streamed successfully in an easy turn to the release side.

▶*BuOrd Comment*—The description gives a practical and ingenious arrangement for suspending the tow target container Mk 1-1 from the droppable gas tank release on an FM-2 aircraft. The information should be of real value to fighter squadrons which have the problem of streaming the aircraft target MK-20, since target is not designed for drop take-offs.

Hydraulic Packings Need Watching

Hydraulic packings conforming to Specification AN-HH-P-114 are manufactured under exacting conditions. Compounding, processing and molding are controlled to a fine degree to produce a packing that is flexible from −65°F. to 160°F. and still retain its sealing properties.

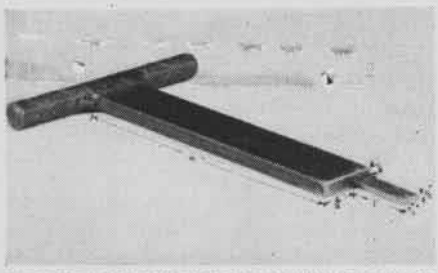
To produce certain physical properties necessary for satisfactory operation, various plasticizers must be added to the packing compound. Under high humidity conditions, the packings will absorb moisture from the atmosphere. While plasticizers used in packing compounds are unaffected by hydraulic fluid, absorbed moisture will react with certain plasticizers to form organic acids. These acids will cause corrosion of the steel used in hydraulic equipment.

Service activities should exercise caution in storage of hydraulic packings to prevent contamination by moisture. In humid climates, packings should be stored in airtight containers if possible, preferably immersed in hydraulic fluid.

Device Cuts Damage While Towing

NAF TRENTON—All tractor drivers are required to insert a "safety T" before towing, to prevent damage to tail wheel assemblies on TBM-1c and TBM-3 airplanes. The "T" was perfected by an aviation chief machinist's mate.

On numerous occasions, damage resulted to the planes through failure to unlock the tail wheel locking control in the cockpit when tow bars were used.



SAFETY 'T' CUTS PLANE DAMAGE WHILE TOWING

Even though the tail wheel may be unlocked at the commencement of towing, sometimes the tail wheel locking pin has been jarred into the locked position. Use of the "T" eliminated damage.

[DESIGNED BY ROBERT ZLOTOFF, ACMM]

▶ ***BuAer Comment*—This device definitely is undesirable and unnecessary for carrier operations. For use at a NAS such as Trenton where scores of TBM planes pass through monthly it undoubtedly serves a very useful purpose. The catch to hold the tail wheel unlocked in the TBM was originally faulty, and a change to fix this up was incorporated. The device should have some attachment to the tow bar to prevent it from being left on the airplane.**

SCREEN NEWS

Know 'em, nail em. Recognition films continue to help qualify applicants in that old game of "spot 'em and pot 'em":

MN-2286am *Recognition of Japanese Airplane* Nell
MA-2286an *Recognition of Japanese Airplane* Sally
MA-2286ao *Recognition of Japanese Airplane* Lily
MA-2286ap *Recognition of the* Warhawk *P-40*
MA-2286aq *Recognition of Japanese Airplane* Oscar
MB-1427bb *Aircraft Recognition*—The Firefly
MB-1432k *Recognition of Airplines—Quizcraft #11*
MN-2532 *Quizcraft #13*
MN-2596ac *Quizcraft #17*

Flight Characteristics. Of special note is the new film on the SB2C-1C:

MN-1327s *Flight Characteristics of Service Aircraft — The SB2C — 1C — 30 Min.*

This picture covers: starting, take-off and landing, engine operation at various altitudes, dives, standard acrobatics, emergency hydraulic-system-failure operation, reasons for superiority over other VSB's.

Engine upkeep. Three new commercial motion pictures on the inspection and maintenance of the R2800 engine now are available:

MC-3925a *Daily and Pre-Flight Inspection Double Wasp R2800*
MC-3925b *Periodic Inspection Double Wasp R2800*
MC-2250 *Double Wasp Magneto and Its Timing R2800*

It can happen here. No modern war can be waged on the carefree assumption that the enemy will politely refrain from the use of poison gas in their plans of conquest. So training in defensive chemical warfare goes on—just in case. Recently shipped to aviation libraries, carriers, and special activities:

MN-3584c *Chemical Warfare — Decontamination Procedure Aboard Ship—16 min.*

This motion picture shows decontamination squads in action aboard a ship theoretically gas-bombed by the so-sorry Japs.

Subjects covered: Spotting of planes with attached tanks, use of detection papers, roping off of gased area, warning to all hands, use of special clothing, mask, gloves, protective ointment; setting up of gear, spraying, scrubbing, inspecting, testing. All through the film, the accent is on safety precautions.

They've got rhythm. When all methods of communication between pilots except hand signalling are out, they'd better "speak" the same language. What happens when one pilot doesn't savvy the other's hand-to-hand conversation is ably demonstrated in:

MN-3467 *Hand Rhythm Signalling in Flight—16 min.*

Chief reason for confusion in manual talking has been lack of standardization of signals. This motion picture undertakes to help bring order out of Babel by explaining the recently established standard method of hand rhythm signalling with Morse code for all naval flying personnel.

The demonstrations begin in the classroom and end up in actual flight with a team of *Hellcats* expertly exchanging hand signals. Both pilots are hep to the rhythm system and swing it together in perfect understanding.

The importance attached to this method of knowing what the other fellow is handtalking about is indicated in a CNO directive stating that "the 'rhythm' method of handtapping signalling . . . will be made standard in the aviation training program."

Who goes there? On the very practical assumption that anybody forced down in strange or hostile territory in the countries neighboring Japan will have more than academic interest in being able to tell a Jap from a Chinese, a recently distributed talking slide film (in color) undertakes to tell the difference—in great detail:

SN-1538j *Theaters of War, Pacific Area —The Jap—His More Honorable Neighbors—24 min.*

This film is a study in recognition—not of planes but of people. Facial features are not the only clues to who goes there. The Chinese, for instance, don't bow in the same way as the Japs and there are differences in speaking tones, shoes, hats, stature.

Other nationalities are also briefly sketched—differences in customs, houses, and appearance of Koreans, Ainus, Formosans, Giliak Indians.

Many a pilot and aircrewman will be glad they saw this film when confronted with unfamiliar faces and the urgent need for making a spot decision on the question: are they or are they not brothers under the skin!

Shipped: The following confidential films have been recently distributed.

MOTION PICTURES:

MN-1006g *Fighter Direction—Communications*
MN-4050a *Airborne Forward Firing Rockets—CV Type Service Unit Training*
MN-4050b *Airborne Forward Firing Rockets—Installation of Mark 5 Zero Length Launcher Kit*
MN-4051 *Airborne Forward Firing Rockets—CV Aircraft Pilot Training*
MN-2104c *Cathode Ray Tube—The Cathode Ray Tube in Airborne Radar*

Where to get 'em. Above films have been distributed to Aviation Film Libraries at:

ComAirPac	*4th MBDAW*
NAC Navy #140	*NAS Seattle*
ASD Navy #3205	*NAS Alameda*
Hedrons 3, 4, 10 11, 12, 16, 17	*NAS San Diego*
FAW 7, 15	*NAS Norfolk*
NAOTC Jacksonville	*NAS Patuxent*
NATCen Pensacola	*NAS Floyd Bennett*
NATCen Corpus Christi	*NAS Quonset*
NATEC Lakehurst	*NAS Atlanta*
MCAS Cherry Point	*NAS Clinton*
MCAS Navy 61	*NAS Moffett*
MarFairWest Coast	*Nas Navy #115*
	Nas Navy #117

Carbon Dioxide Gas Is Found

A west coast naval air station reports that out of one group of 50 aviators' breathing oxygen cylinders, 26 were found to be contaminated with a dangenerously high percentage of CO_2.

The story of how this contamination occurred is related so other aeronautical activities may benefit and avoid hazard to Navy personnel and equipment. Personnel at this west coast station, in apparent violation of existing BuAer orders, repainted eight carbon dioxide cylinders green and stenciled them "Aviators' Breathing Oxygen." These same cylinders, still containing some residual carbon dioxide pressure, were sent to local oxygen supplier for refilling.

Since this oxygen supplier utilized an oxygen refilling procedure employing a multi-place manifold and pressure equalization process, the residual carbon dioxide pressure was in part transferred to all cylinders on manifold at the same time. Consequently all supposed oxygen cylinders, stenciled "Aviators' breathing oxygen" and painted green, contained as much as 32% carbon dioxide. Use of these cylinders by personnel on high altitude flights likely would have meant disaster for plane and crew.

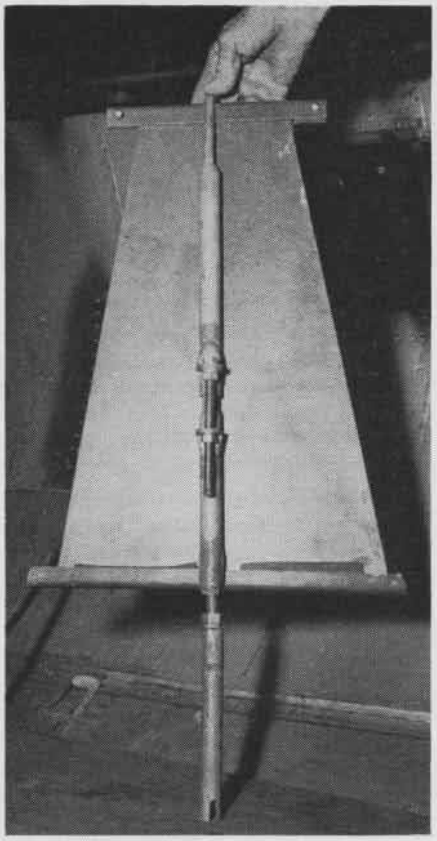
Basic error committed was improper and always potentially dangerous conversion of cylinders for one gas to contain another gas. The rule governing conversion of high pressure gas cylinders in this instance is specifically covered by BuAer manual with this statement: "Oxygen cylinders shall not be used for carbon dioxide or vice-versa."

Tool Installs PBY5 Armor Plating

NAS Corpus Christi—A tool for installing armor plate in the aft part of a PBY5 tower has been designed by an automotive mechanic at this activity under the naval employees' suggestion program.

Installation of structural sections in aircraft is frequently performed under difficult conditions. In addition to working in cramped quarters the mechanic at times needs several extra hands when engaged in assembling.

This device which acts as a positioner and clamp at the same time may be compared to a long wood clamp in appearance. Composed of three parts which telescope into each other, the tool is capable of being quickly adjusted for length and clamped upon the section being handled. The lower section has a screw and nut arrangement for height adjustment. The three sections of the place structure are converted into one when the tool is applied and thus assembling operations are greatly facilitated. The plane section



THREE TELESCOPING PARTS ADJUST TO LENGTH

thus clamped is easily set in place leaving the mechanic free to perform the necessary assembling operations.

With this tool one mechanic can accomplish in 30 minutes an installation of armor plate which formerly required up to three hours' work on the part of two mechanics. A factor of safety is provided by the tool and damage to the ship is minimized by a reduction in accidental dropping of the section being assembled. About four and a half hours a ship are saved by its use.

[Designed by Clarence C. Shannon]

Altitude Limit Indicator Changed

VF(N)-79—This squadron has developed a device of much benefit which possibly may be so to other squadrons. The device is a modification of the altitude limit indicator of the radio altimeter which is being installed in numerous naval aircraft.

As furnished, the indicator consists of three lights. The green upper light indicates the airplane is too high, the middle amber or white light indicates altitude is correct and the lower red light shows the plane is too low. This squadron found dimmers provided for these lights were inadequate; that sufficient dimming to preserve dark adaptation forced the pilot to look directly at the lights and that with very dim lights it was difficult to distinguish between green and white without staring an inordinately long time.

These drawbacks were overcome by constructing a new indicator. All three lights were made red and covered by a cover plate. Over the "too high" light the plate was perforated with a series of small holes forming a landing signal officers "high." Over the middle "correct altitude" light perforations are in a horizontal line. Over the "too low" light is a signal officers "low" signal. Baffles between lights prevent interference and a rheostat is provided for brightness control.

The device has proved successful in operation. Details can be secured from VF(N)79 or from the Night Fighter Training Unit, NAAF, located at Charlestown, R. I.

▶ *BuAer Comment*—**The subject mask is satisfactory for night fighter operation of the AN/APN-1 altimeter. However, it must be kept in mind that it may be desirable to use the altitude limit indicator lights of these altimeters in the daytime and, under such conditions, there will not be sufficient light to give a positive altitude indication.**

BuAer is conducting an investigation on the altimeter indicator lights for night fighter. The Grimes shutter type of indicator light has been supplied and information received by this Bureau indicates these are not entirely satisfactory. Any comments on this device or any other type of "gadget" relative to the problem of altimeter limit indicator lights would be appreciated for analysis by the Bureau.

GUNNERY BY REPLICA

Facilities for training of aviation ordnancemen in the rearming of carrier based combat planes, are provided by the Aircraft Arming Replicas developed and produced by BuAer's Special Devices Division. In order to give ordnancemen realistic training, ordnance equipment and adjacent parts of the replicas are faithful duplicates of the actual airplane. The feed and ejection chutes as well as ammunition boxes, were copied in sheet iron. Both gun installations and charging systems include the actual ordnance items. Ordnancemen can handle guns and install bombs and torpedoes as though they were working with an actual plane. Replicas have been produced for F6F-3, F4U-1, TBF-1, and SB2C-1c. Replacement wings for fighter types are available in both .50-cal. and 20 mm. Device 12P. Replicas are of wood with plywood skins and are given a coating of protective paint.


U.S. NAVY
SB2C-1
BUREAU OF AERONAUTICS
TRAINING DIVISION
SPECIAL DEVICES SECTION

PHOTOGRAPHY

Color Photographs from Fleet are Better

Public Relations reports that better quality color photographs are beginning to arrive in the Navy Department. It is again pointed out that correct exposure, good composition and interesting subject matter are the controlling factors for successful news and pictorial color photographs. In black and white photography a section of a good negative can be enlarged to cut out non-essential details but this does not work out so well in color; therefore a large image where little cropping is necessary is very desirable.

Here Are Photographic Supply Points

In addition to the six regularly established photographic supply points, two new ones have recently been organized; one at ASD Navy 825 and the other ASD Navy 3205. The complete list of photographic supply points follows: Naval Aviation Supply Depot, Philadelphia; Naval Aviation Supply Depot, Norfolk; Aviation Supply Annex, Oakland; Naval Air Station, San Diego; Naval Aviation Supply Depot, Oahu, T. H.; Aviation Supply Depot, South Pacific; Aviation Supply Depot, Navy 825; and Aviation Supply Depot, Navy 3205.

Photographic material as listed in the Standard Photographic Stock List may readily be obtained from any of the above mentioned supply points by routine shipment requests or by requisitions. Instructions for the proper method of ordering photographic material will be found on the inside cover of the Standard Photographic Stock List NavAer 453. It is suggested that these instructions be followed closely.

Glossy Dryer Speed Can Be Increased

It is possible to increase the speed of Pako Glossy Dryer approximately 30% by enlarging diameter of rubber gear drive with ordinary rubber tape. This method may be used on short periods only and for prints dried either glossy or matte. If matte prints are acceptable it is more practical to use the Pako Matte Dryer, which operates 50% faster than the Glossy.

Navy Photo Training Courses Are in Mail

Navy Training Courses, Volumes 1 and 2 (NAVPERS Nos. 10371 and 10372) are now being mailed to all units. This mailing was estimated to provide one copy for each photographic officer and photographer of the Navy, Marine Corps, and Coast Guard. Additional copies to meet those requirements may be had upon request to BuPers, and also as a convenience may be ordered from BuAer along with other photographic publications listed in the NavAer Publications Index.

▶ Tests indicate that Ansco *Hypan* 16 mm. gun camera film cannot be developed to a satisfactory black and white negative. Since sufficient stock of *Universal* film is now available in the supply depots no *Hypan* should be used in combat areas.

BLIMP SQUADRON PROVIDES JUNGLE RESCUE KIT CONTAINING MANY NECESSITIES FOR SURVIVAL

Bag Contains Supplies for Jungle

NAS LAKEHURST—A jungle rescue kit, constructed of a heavy canvas material and in a form similar to that of a parachute bag, has been developed by Blimp Headquarters Squadron Five to assist in rescue operations. The 60-pound kit can be stowed easily aboard an airship and is not too cumbersome for a man to carry. A parachute harness is attached to the outside of the kit so that it can be lowered to the ground by a line. The harness is detachable and can be used for other purposes.

In addition to food and medical supplies, the kit contains mosquito netting, head nets, insect repellents, quinine, machettes, gloves, and other equipment especially needed for survival in the jungle. The kit is equipped to maintain six people about ten days.

▶ ***BuAer Comment*—BuAer will appreciate information and comments as to whether the requirements for jungle rescue kits justify procurement by BuAer.**

Tool Removes Oil Jets With Ease

CASU-1—A completely fool-proof tool for removing the oil restricting jet from supercharger rear cover when complying with Wright R-2600 Engine Bulletin No. 127, has been devised by this unit. It not only saves two or three man-hours but completely avoids damage to the metering jet. These jets were frequently damaged by old methods of removal.

Five parts comprise the removal tool. Largest of these is a piece of cold rolled steel with holes in each end to fit on the generator mounting flange and a bushing hole drilled through it toward the center to line up with the jet. The bushing hole is drilled through at an angle of approximately 67½° and tapped with 28 threads to the inch. There is a bushing, made to fit the hole, a screw driver with a shoulder near the lower end, a wrench to fit the bushing and another wrench of the socket type. This socket wrench applies pressure simultaneously to both bushing and screw driver.

In use, the bushing plate is secured to generator mounting flange, screw driver is inserted through bushing hole in oil jet, bushing is screwed down snugly against shoulder of screw driver and tightened with special wrench and socket wrench is applied to remove jet.

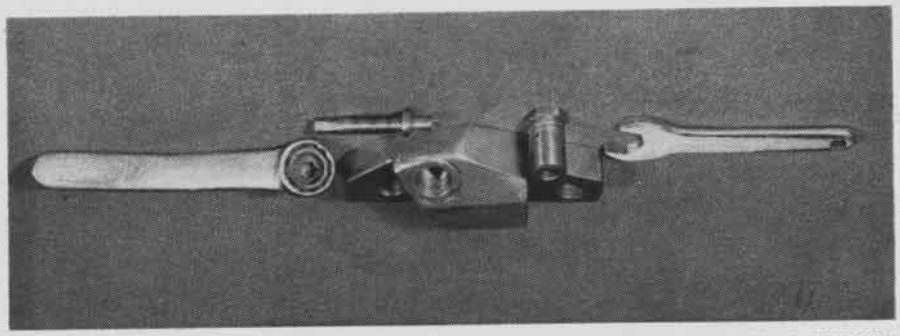
[DESIGNED BY M. A. TUEL, AMM1c]

▶ ***BuAer Comment*—These tools appear to be practical and relatively easy to manufacture. It is believed similar tools would be of service to other activities.**

Fuel Cell Care Prevents Troubles

Self-sealing fuel cells, sometimes cursed by those who have to install or remove them, but permanently loved by those whose safe return to base has been a result of their efficient presence, are subject to many ills. T.O. 4-44, dated 20 March, deals with these ills, their cause, cure and prevention.

Although correspondence from the field indicates a growing use of this T.O., a few RUDM's have been received which indict the writing activities for lack of compliance with precautionary measures contained therein. These measures are designed to insure that



BUSHING AND SCREW DRIVER WORK TOGETHER IN FIXED ALIGNMENT AS OIL JET IS REMOVED

every self-sealing fuel cell is physically fit to fight in every action. Use them.

And while on the subject of T.O.'s notice the colored one, 95-44. After all the trouble, necessary and otherwise, that hose has caused in the past three years in spite of corrective letters, it was decided that a little sugar coat on the medicine might save a life or two, so it was done in colors. If only the part in color gets any attention, it will still show a profit, but there are other points worth checking.

For example, on page two, an obsolescent hose and its treatment are discussed. Proper replacement thereof, and necessary precautions until such replacement is available will save many headaches and not a few ATR's. Engineering officers should get that copy back out of the file and read it this time. If it is lost, AN-H-26 hose used as AN-878 connections and identified by a solid red and white stripe is replacing AN-H-456, a hose used as AN-884 connections. The latter was marked with a broken red & solid white stripe.

If there is no AN-H-26 hose on hand, continue to use the old hose, but select it carefully for lack of surface and end cracking and protect the selected hose with a coat of fuel cell exterior lacquer, Buna-Vinylite Lacquer, but common fuel cell repair cement will do.

Salt and Sand Aid in Snow Removal

From an Army air field at Rome, N. Y., comes a tip on keeping airport runways clear of ice and snow. During the 1943-44 winter at this field it was found that a 25% by volume addition of rock salt thoroughly mixed with sand kept runways clear.

At first sign of accumulating snow, four heavy duty V-plows, with blade adjusted to give a close cut, clear runways. Trucks holding four tons of salt and sand, thoroughly mixed, spread the anti-freeze blanket evenly behind the snow-plows. These trucks move as fast as 30 mph and can quickly protect en tire length of runways against ice formation at outset of the storm.

Dissolving salt in mixture melts remaining thin blanket of snow and keeps falling snow in a mealy condition so that as often as necessary during course of storm plows can clean down to bare pavement without encountering ice or leaving behind areas where a sheet of snow clings to pavement surface.

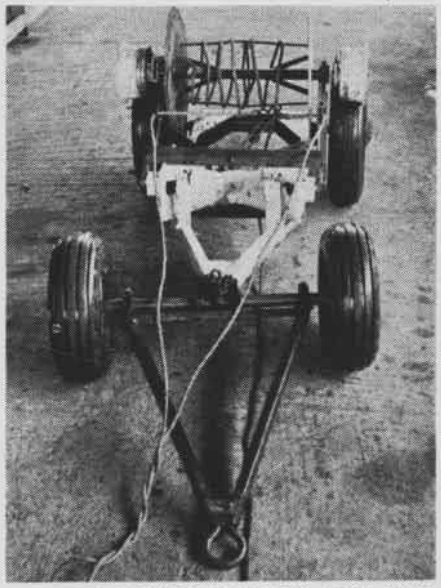
Salt of a single application gives adequate anti-freeze protection unless storm is unusually severe. Service roadways and concrete aprons received the same treatment. After employment of this snow removal technique at the Rome field not a single Army plane was forced to make use of an auxiliary field.

AVIATION ORDNANCE

INQUIRIES SHOULD BE ADDRESSED TO THE CHIEF OF BUREAU OF ORDNANCE

Field Tow Line Pick-up Is Time Saver

The American serviceman, faced with a large number of confusing problems in his daily work, has shown a flair for invention that has resulted in the development of many labor saving devices in fleet-wide use. Two examples of such inventive genius are tow line pick-ups which were designed to take some of the muscle work out of the tiresome routine job recovering tow lines dropped on an airfield following



REEL WITH FRICTION DRIVE HAS LEVEL WIND

gunnery exercises and to reduce considerably the time required for this operation.

One of these devices, designed by Marine Base Defense Aircraft Group 42, makes use of the Bomb Trailer, Mark 2 as a base for the frame of a tow line reel. Power for its operation is obtained from contact of a six-inch roller with a rear tire of the trailer and this power is transmitted to the reel by means of a belt-pulley system

BELT-PULLEY SYSTEM ROLLS UP TARGET LINE

as shown. The roller is normally separated from the rear wheel by ordinary pendulum action. Bringing the roller into contact with the wheel is accomplished by actuating a lever-cable combination. The entire low-line recovering operation requires only two men; one to operate the lever and keep the line evenly wound on the reel, and one to drive the jeep as it pulls the trailer of the tow lines.

Closely resembling the above design, but independently developed in Scouting Squadron 54 by V. C. Blanke, AOM1c, is another retrieving device. The reel in this case is directly driven by two tire contact rollers secured to the extensions of the reel axle. The entire reel assembly is mounted on a locally modified Bomb Trailer, Mark 2 with its after cradle removed and welded in a rotated position, curved surface forward, in front of the remaining cradle. Rear wheels were taken from the Bomb Trailer, Mark 1. A movable guide, controlled by a harness from the rear of the towing vehicle permits even distribution of the tow-line on the reel. Threading the tow-line through a suitable opening in the bottom of the trailer, lined with pipe rollers, prevents cutting or chafing of the line as it is pulled up by the reel.

New Reticle for Night Fighters Developed

A new reticle for Illuminated Sight Mark 8, designed specifically for use in night fighters, has been developed by BuOrd on recommendations of Navy, Marine and R.A.F. night fighter squadrons. Its simple pattern, two 90° arcs opposite each other on the 50 mil circle, and a center "pip," was employed to cut down unnecessary illumination on the reflector of the optical sight, thereby reduce glare. Another reason for the simple "parentheses" reticle pattern is that night fighters get in most of their shots from a position dead astern of their target and therefore have little use for deflection rings as such. The "parentheses" are used to assist the pilot in centering the target in his sight.

RETICLE

The night fighter reticle has the same dimensions as the reticle presently installed in the Illuminated Sight Mark 8. To install night fighter reticle in Mark 8 sight it is necessary to remove reticle mount assembly from sight, remove present reticle and orange-yellow ray filter from mount assembly, and install night reticle (Stock No. 2-R-601) and special flashed opal glass ray filter (Stock No. 2-7-185-75) in mount, and replace reticle mount assembly in the same sight from which it was removed.

The special opal glass ray filter was developed to provide uniform illumination over a wide range of eye movement. It is important to keep the reticle mount in its own gun sight, since they are matched in their manufacture by careful machining to bring the reticle exactly to the focal point of the lens system.

Night fighter reticles will be furnished mounted on a brass ring, as were the standard metal reticles for Gun Sight Mk. 8.

Coil Tester Cuts Down Test Time

NAS San Diego—Approximately 30 man-hours a week are saved at this station through use of an electrical test set for checking Bosch induction vibrator and Eclipse booster coil. This set, designed by an electrician under the Navy's beneficial suggestion program, also makes possible quick and accurate checking by unskilled station personnel.

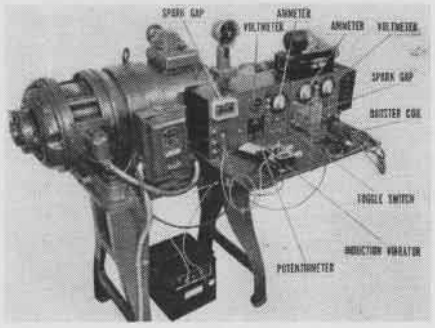
The test set was designed for checking the vibration and coil for proper functioning of condenser, relay, coil and density of spark. All necessary instruments and equipment for making these tests with exception of generator and battery are contained with chassis and panel of set. Current supply for testing booster coil is furnished by Eclipse 28-volt, type 314 generator; a 24-volt battery is used for testing induction coil.

Photograph shows the induction vibrator set up for test on left side and booster coil set up for test on right side of testing set.

Procedure for checking vibrator is: *a.* Remove cover and check relay for proper spacing of points. *b.* Plug in portable leads in Nos. 1, 2, 3 receptacles in left panel and connect other end of leads to the vibrator. *c.* Set potentiometer to the closed position and turn toggle switch to No. 1 position. *d.* Open potentiometer slowly until relay points close. Note voltage reading; if reading is not as it should be, adjust spring on the relay contact (see Bosch Service Instructions). *e.* After adjustment is completed turn toggle switch to No. 2 position and check ammeter reading; if not correct, adjust spring tension on vibrator contacts. *f.* Check spark gap for density and consistency of spark and contact points for excessive arcing to determine condition of condenser.

Procedure for testing booster coil is: *a.* Remove cover and check contact points for alignment. *b.* Remove window plug at end of booster for access to adjusting screw. *c.* Switch on generator current which is regulated to 28.5 volts. *d.* Press momentary switch button and adjust contact screw for proper ampere reading (see TO 88-43). *e.* Check density and consistency of spark for condition of condenser.

[Designed by E. O. Meershaum]



TESTING SET SAVES 30 MAN-HOURS PER WEEK

(Succeeds List of September 1, 1944) *1 October 1944*

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

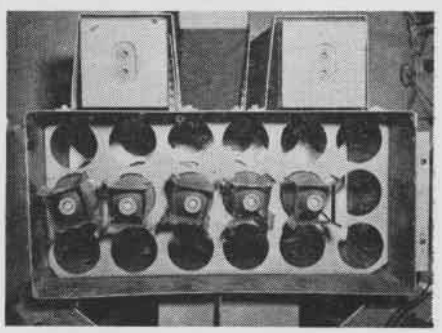
(Contract changes are not included)

Airplane	Bulletin	Date	Change	Date
F6F	65	9-8-44	78	9-5-44
FM-2	16	8-4-44	25	9-4-44
F4U-F3A-FG	95	9-19-44	193	9-9-44
J2F-6	1	2-25-44	8	8-26-44
JRB-1	17	9-19-44	14	8-24-44
JRB-2	16	9-19-44	15	8-24-44
JRB-3	3	8-5-44	3	8-23-44
N2S-3	24	9-18-44	31	7-7-44
N2S-4	15	9-18-44	12	7-7-44
N2S-5	7	9-18-44	11	8-14-44
OY-1	1	8-24-44	2	9-4-44
PV-1	68	9-15-44	154	9-18-44
PV-2	1	8-1-44	3	9-5-44
PV-3	13	3-29-44	12	5-2-44
PBJ-1	26	9-15-44	55	9-16-44
PBM-3D	24	9-12-44	53	9-7-44
PBM-3R	50	9-8-44	139	9-7-44
PBM-3S	30	9-5-44	86	9-7-44
PBM-5	5	9-12-44	5	9-21-44
PBN-1	6	9-1-44	50	7-19-44
PBY-5	58	9-5-44	169	8-10-44
PBY-5A	70	9-5-44	161	8-10-44
PBY-5B	13	8-31-44	36	3-13-44
PB2Y-3	40	7-22-44	147	8-11-44
PB2Y-3R	42	7-22-44	128	8-11-44
PB4Y-1	80	9-19-44	122	9-19-44
PB4Y-2	3	8-31-44	1	8-18-44
PB2B-1	6	9-15-44	3	6-22-44
R4D-5	19	8-18-44	23	9-7-44
R5C-1	16	9-13-44	80	8-28-44
R5D-1	24	9-16-44	82	8-26-44
RY-1	29	9-19-44	22	9-13-44
RY-2	14	9-19-44	9	9-13-44
RY-3	1	8-31-44	0	——
SBD-3	86	8-22-44	155	6-23-44
SBD-4	41	8-22-44	67	6-23-44
SBD-5	58	9-5-44	74	8-12-44
SBD-6	18	9-5-44	14	8-12-44
SB2C-1	74	9-22-44	103	9-1-44
SB2C-1C	66	9-22-44	110	9-1-44
SB2C-1A	13	8-24-44	21	8-30-44
SB2C-3	57	9-22-44	76	9-13-44
SB2C-4	18	9-20-44	18	9-13-44
SBF-1	36	9-20-44	48	9-20-44
SBF-3	24	9-20-44	13	9-20-44
SBF-4	3	9-13-44	0	——
SBW-1	45	9-22-44	59	9-1-44
SBW-3	42	9-22-44	44	9-1-44
SBW-4	3	9-13-44	0	——
SNB-1	19	8-8-44	23	8-24-44
SNB-2	18	9-9-44	16	8-24-44
SNB-2C	8	8-8-44	10	8-28-44
SNJ-5	9	9-14-44	10	8-8-44
SNV-1	21	7-5-44	53	8-24-44
SNV-2	5	7-5-44	6	8-24-44
TBF-TBM	121	9-18-44	206	9-13-44
TDR-1	0	——	7	9-7-44

Rack Will Receive Float Lights

Need for a large number of readily available float lights in anti-submarine warfare led to the design of a simple, sturdy rack for carrying these lights in TBF and TBM airplanes. Accompanying photographs show details and general arrangement of the rack. Square brackets on top of the rack were added for the housing of Mk-6 float lights.

[Designed by Ivan F. Helt, AM/1c]



NEW RACK CARRIES FLOAT LIGHTS IN AVENGERS

PIX QUIZ What Do You Know About Flight Instruments?

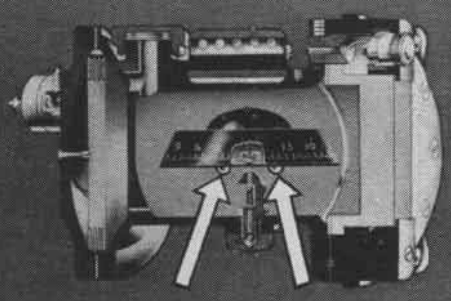
A PILOT who does not know his flight instruments is going to need a wide assortment of rabbit's feet to keep flying. Plenty of pilots owe their lives to instrument "know how." Check yourself on these instrument questions then get answers on page 40.

[QUESTIONS FROM BUAER SPECIAL DEVICES VISUAL QUIZZER FILM NO. 41, FLIGHT INSTRUMENTS]

Write answers here

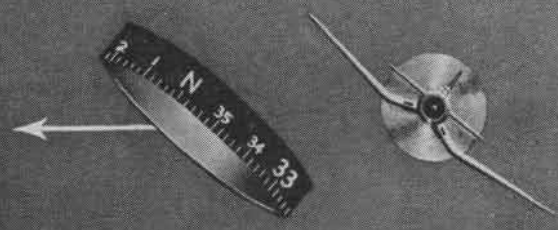
1. ..... 4. .....
2. ..... 5. .....
3. ..... 6. .....

1 Arrows indicate the:



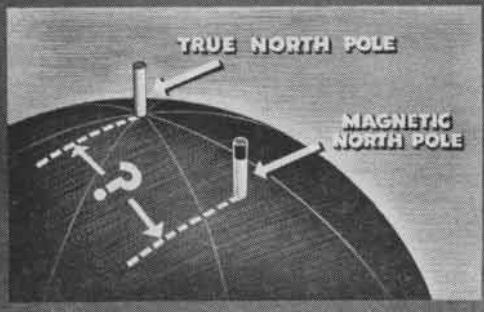
1. Dampers
2. Magnets
3. Gimbals
4. Counterweights

2 Arrow indicates the direction of:



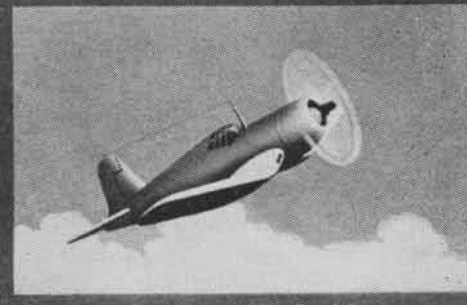
1. Magnetic force
2. Centrifugal force
3. Deviation force
4. Variation force

3 Approximate distance indicated is:



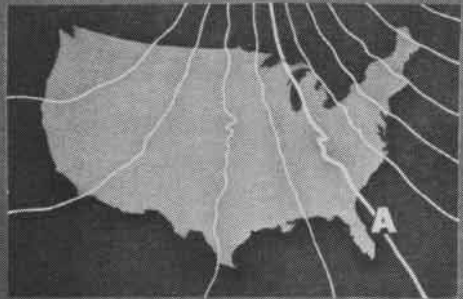
1. 500 mi.
2. 50 mi.
3. 1,000 mi.
4. 750 mi.

4 Plane is on north heading; compass will indicate:



1. 3° turn east
2. 3° turn west
3. No error
4. 6° turn west

5 Line A is the:



1. True meridian
2. Line of bearing
3. Rhumb line
4. Agonic line

6 On this flight, the pilot should set his barometric scale to:

1. 30.58"
2. 22.89"
3. 31.58"
4. 20.58"

CONTENTS

ANSWERS TO QUIZZES

• GRAMPAW QUIZ (on page 8)

1. Make yourself stay in formation and check your altitude by a quick glance at your instruments. Probably effected by Vertigo. Reference: T.N. 61-42.
2. Insist on a thorough inspection before the plane is again flown. Reference: Flight Safety Bulletin No. 5-44.
3. Yes. Reference: Technical Order 42-43.
4. Clear the runway immediately and wait for further instructions. Refference: Army-Navy-CAA Standard Airport Traffic Control Procedure, section 1.2201.
5. (a) Shift to proper tank.
   (b) Use auxiliary fuel pump.
   (c) Retard throttle to one-fourth position. Reference: Flight Safety Bulletin No. 25-44.

• BEST ANSWERS (on page 10)

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

• NAVIGATION (on page 12)

1. 0640, May 16
2. 1940
3. May 16
4. 2340, May 16

• PIX QUIZ (on page 39)

1.2 2.2 3.3 4.3 5.4 6.1

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

LETTERS

SIRS:

Have just had a lot of fun trying to arrive at the same answer you give in your Navigation Problem in the September 15 issue.

At first I thought it was my error, but none of the other fellows could get it, so I thought I'd write.

You give the course of the fictitious ship as 252.5°. This is quite impossible as the departure point and arrival point are approximately the same longitude; thusly, the answer has to be close to 000°.

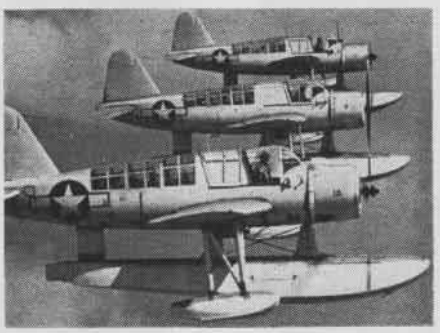
Am enjoying your magazine a lot.

ROBERT LEE S. HYMAN
Ens. A-V(N)
VC-19 FPO NYC

¶ Owing to typographical error, the course given in the answer was listed erroneously as 252.5° instead of 352.5°. The rest of the answers listed for the problem depend upon a given wind velocity of 28 knots from direction of 138°, which was omitted from the original problem. Kudos to Ens. Hyman and also Lt. Henry F. Rohrkemper, USCG, who also wrote.

SIRS:

In response to your SQUADRONS—LET NANEWS HEAR FROM YOU, we submit photograph of a section of this squadron in



formation flight. The three pilots are ensigns returning to base from an ASW bombing exercise.

LIEUTENANT, USNR
VS-39 Atlantic Fleet

SIRS:

In reference to your article in the August 15, 1944, issue of NAVAL AVIATION NEWS outlining combat swimming and water survival, it occurs to me that perhaps a very important factor involved in abandoning ship procedure was omitted. The particular factor, which I believe of great importance when determining which side of the ship to go over, is drift. Regardless of list, I believe that it is much more desirable to go over the side opposite the direction of drift, especially if the ship is drifting rapidly.

Thanks for letting the Army stick in its oar.

LT. COLONEL,
Tampa *Hq., Third Air Force*

¶ The Army makes a good point. In abandoning a drifting ship, men should disregard the list and go over the weather side in order to avoid being run down once they are in the water.

THE CARRIERS' CHICKS

Nature is turned quite backward when the hen
Mother of chicks, does not protect her brood.
Does not spread out her wings as covering hood,
But sends them out to danger; even when

The hawks are hovering, what can her purpose be?
The aircraft carrier, under attack at sea,

Is desperate as a hen, but these small fry,
Her chicks, that take to the embattled air
At first alarm, are hardly helpless there.
Dreaded *Corsairs;* they clear the threatening sky.

—VICK LINDLEY, ARTlc, CASU 22

SIRS:

The following poem was written by a member of the CNATRA staff to stimulate instructor morale, and it is considered that the poem could be of benefit to the naval service if given wide distribution in NAVAL AVIATION NEWS. R.C.B

Naval Air Training Command.
Pensacola.

CITATION

There is no such thing as a single-seat plane,
Out on the far-flung fronts,
For with every pilot, as co-pilots, fly
The men who instructed him once.

The hand on the stick of an F-4-U,
Blasting away at the Japs,
Is not just the hand of a single ace—
It's the hand of a lot of chaps;

The split-second timing that settles the hash
Of another of Tojo's ships
Began in a classroom in Florida,
With a bombing instructor's tips;

And the eye that places the pipper upon
The one right point in the skies
To send a *Zero* screaming down,
Is the eye of a lot of guys

Whose duty keeps them plugging away
Leading nothing but sleeve attacks,
While they pass the word on gunnery
In Corpus or Pensi or Jax.

So the Navy Cross and the DFC
Are never awarded alone
To the fellow who happened to carry the ball,
Out in the battle zone,

And every citation silently names
The anonymous honor roll
Of instructors, back in the Training Commands,
Who steadily take their toll

Of the enemy, by turning kids
Into pilots fit for the Fleet.
So you see, there really is no such thing
As a plane with a single seat.

—LIEUT. M. L. CLOPTON
(from *Instructor's Round Table*)

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WE HOPE THIS PLANE ESCAPED OUR FIRE

Squint hard at this picture, taken from one of our cruisers. Do you recognize the plane?

Our AA crew didn't. They're baptizing it with shellfire, failing to recognize our own aircraft . . . a TBF Avenger.

This is the chance you take, pilots, when you don't identify as you approach Allied vessels.

Yes, AA crews are drilled to recognize, and they try hard. But don't you pay for it . . . if they fail!

Identify
WHEN APPROACHING ALLIED SHIPS!

NAVAL AVIATION NEWS

Free Gunnery Training
Life Raft Signal Flag
Hurricane Bill Works

Nov. 1, 1944
RESTRICTED