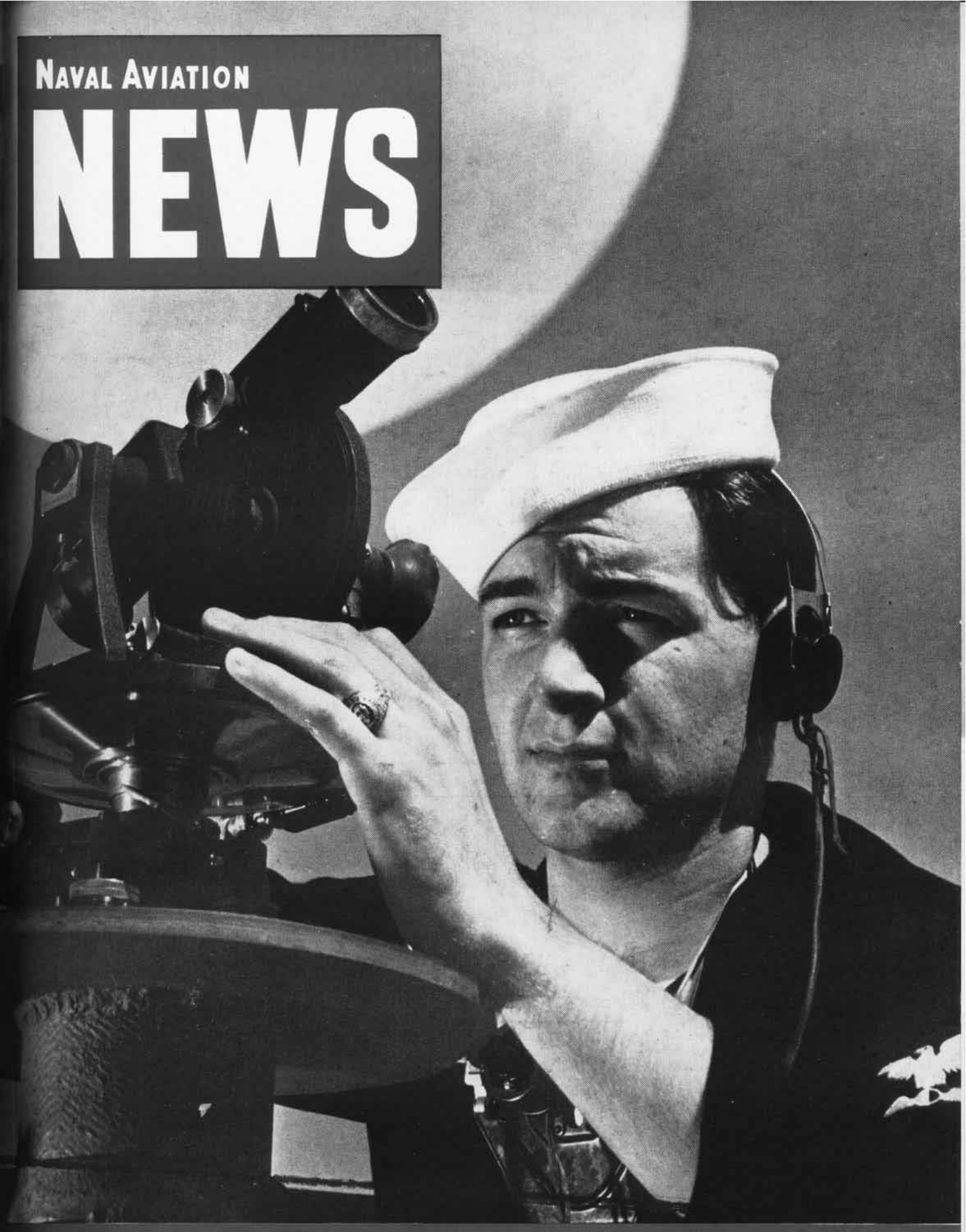
NAVAL AVIATION NEWS



Project 'Cast'
Typhoon Recco
Nazi Trainers

April 1946

RESTRICTED

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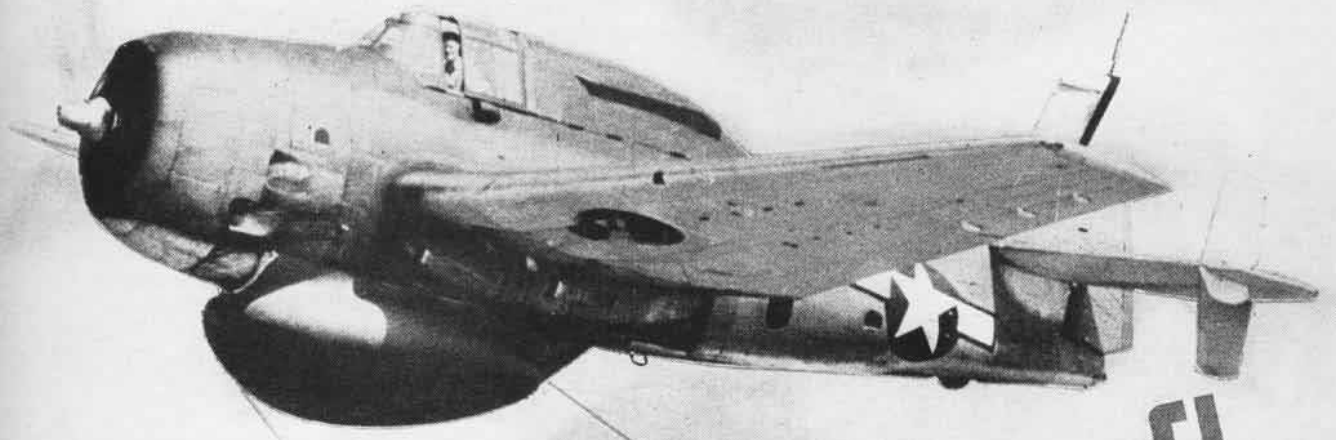
Don't cover up ideas: Let all the Naval Aeronautical organization read about them in Naval Aviation News. Forward news reports every month as directed in ACL 128-45. Include technical developments; maintenance and overhaul data from A&R; safety and survival information from operations and squadrons. Ideas and developments that helped your station will also aid others.



RADAR learns to fly

Scientists' Experimental Models Pass Stiff Air Operation Test in Project Cast Planes

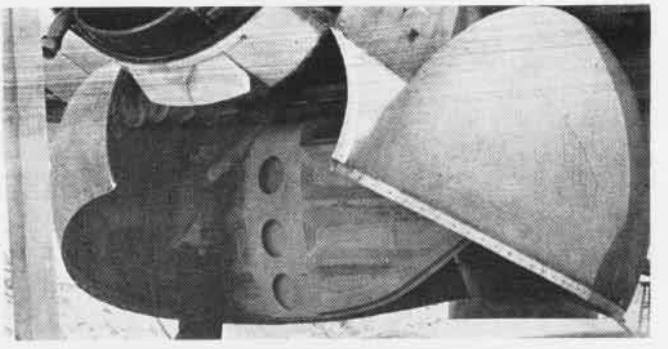
IT WAS A tense moment for *Project Cast*, a small Navy unit based at Bedford Army Airfield near Boston. The only aircraft of its type in existence, carrying the only electronic system of its kind yet built, was just about to take off.

The plane was an XTBM-3, carrying a new high-powered radar, the AN/APS-20. But it looked like no TBM ever seen. The torpedo bay had been replaced by a bizarre, bulbous radome housing the largest radar scanner ever built for use in aircraft. The turret and part of the greenhouse had been modified to provide quarters for a radar operator whose fingers would release the greatest power ever to spurt out from an airborne transmitter. Two extra fins had been added to the empennage.

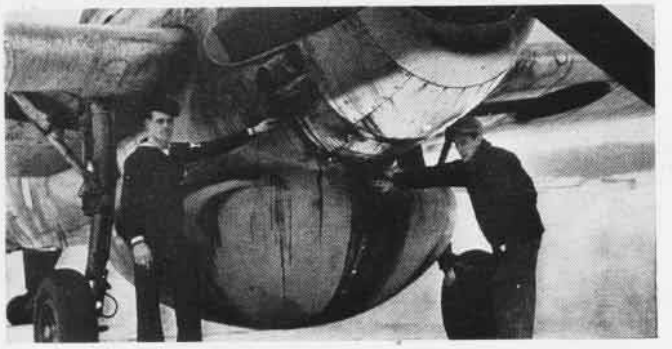
"Looks like a guppy," someone had said.

"It'll never fly," others had predicted.

But the plane took off and flew around New England for more than an hour while the scientist saw in his radar scope a map covering more territory than ever before appeared in an airborne indicator. When the plane landed safely, even skeptics had to admit that the new radar was probably here to stay. Before a year had passed, experimental models of the AN/APS-20 radar reached the Fleet.



OPEN JAWS OF AN/APS-20 RADOME REVEAL BIG ANTENNA SCANNER



BULBOUS 8x3 FT. RADOME MAKES THIS TBM A PILOT'S PROBLEM

'GEORGE' RADAR ON PBM IN THIS PICTURE HELPED LICK U-BOAT

'CAST' HELPED DEVELOP COUNTERMEASURES SYSTEM FOR PB4Y-2

'PROJECT CAST' USED HANGAR AT BEDFORD ARMY FIELD, BOSTON

FOR PILOTS of *Special Projects Unit Cast*—the Navy's flight-testing activity for experimental electronic equipment developed by the Radiation Laboratory and Radio Research Laboratory—tense moments like that first takeoff of the first AN/APS-20 equipped aircraft became routine during the hectic days of World War II when the Fleet called for ever-better radars and laboratory scientists raced against time to turn them out.

Back in the days when submarines first threatened American ships, for example, the Navy appealed to electronic experts for help. By the time the menace was critical, Radiation Laboratory had come up with *George* and *Dog*, two microwave radars whose pencil-like beams were sensitive enough to point out surfaced subs or even their conning towers—in theory. To find whether the new ASG and ASD would operate also in flight, *Project Cast* personnel modified planes to accommodate the radar units, installed them, and flew tests which proved that microwave radar could make the seas unsafe for U-boats. Within a short time after *George* and *Dog* reached the Fleet, the submarine menace was under control.

FLEET CALLS ON CAST TO SOLVE PROBLEMS OF MICROWAVE RADAR

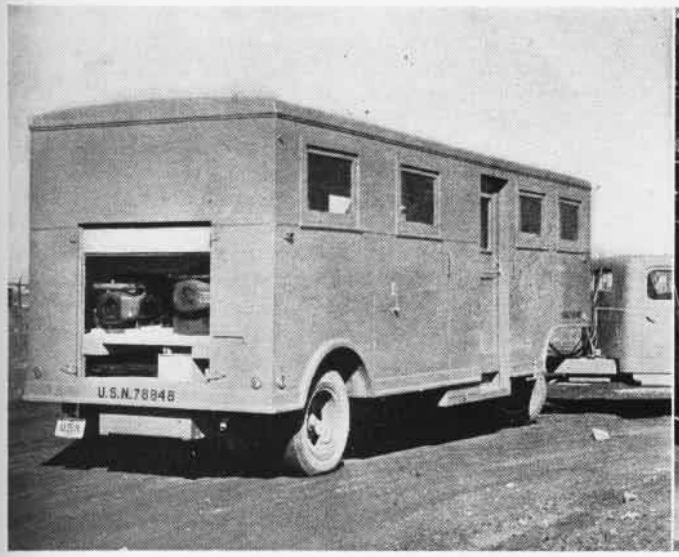
THAT STORY was repeated when the Fleet needed night-fighter radar, blind bombing aids, instrument approach equipment, countermeasures to foil enemy radars, and electronic control systems for pilotless aircraft—virtually every microwave development used in naval aviation. As each call came, *Cast* personnel installed experimental models —often known only by code names such as *Rosebud, Firefly, Butterfly, Dutch Schultz* or *Black Maria*—into specially modified aircraft. Then *Cast* pilots took scientists into the air to find whether the new developments were suitable for battle or a bit too delicate for combat weapons.

To find whether delicate electronic equipments could stand the gaff of combat flying, *Project Cast* pilots had to test them in extremes of weather, in darkness, at strange fields in widely scattered locations. They had to fly every type of naval aircraft from gliders to PB4Y-2's and B-17's. They had to complete tests in the shortest possible time to meet the constant-hurry-up demands of the Fleet. And they often had to fly under the strain of knowing that the equipment installed was the only one in existence, that the scientist aboard was the only man completely familiar with the new device. Nevertheless *Project Cast* achieved an enviable safety record: for more than two years not a single fatality occurred. In 13,000 flying hours covering almost three years of operations, not a single scientist had been scratched.

Project Cast's safety record was made possible by the strenuous efforts of every man from the officer in charge down. Every pilot was sent to Instrument Flight School at NAS ATLANTA; special training was conducted constantly at the *Cast* hangar for pilots and all other flying personnel; frequent Link trainer sessions were required; a well-equipped instrument shop was established; maintenance personnel were rigidly selected and then highly trained to keep aircraft operating smoothly at all times.

One of the most important phases of the safety program was the special attention given to weight and balance of aircraft which had been modified so radically and loaded so heavily that flying characteristics were no longer known. When the original AN/APS-20 equipped aircraft was prepared for flight tests, *Cast's* wartime officer-in-charge recalls, "pilots felt their way slowly as the airplane was loaded, checked, loaded more heavily, and rechecked, until finally all gear was in the plane and operating." Safety was stressed.

PROJECT WEIGHT AND BALANCE OFFICER WITH AN/APS-4 ON SNB



FOR RCM TESTS ON FIELD, 'CAST' RIGGED EFFICIENT TRAILER

INSIDE TRAILER, CREW COMMUNICATES WITH THE TEST AIRCRAFT

AGAIN when the AN/APS-30 series of radars was being flight-tested in a PB4Y-1 called *Snort*, a new nose had to be built and the tail structure modified. When a special countermeasures system was developed for PB4Y-2 *Privateers*, antennas scattered over much of the forward section added drag to the fuselage. In preparing other aircraft for experimental electronic installations, *Cast* personnel removed bomb bays, turrets, gun mounts, substituted new noses, and made many other changes.

Although *Cast* had not been provided with facilities for making extensive modifications, experience proved the work must be done on the spot to avoid long delays. Moreover, equipment installed in the aircraft was so highly classified that, to preserve security, all maintenance up to but not including major overhaul had to be completed locally. The problem was solved by selecting skilled personnel and then encouraging them to use all their ingenuity in operating various shops.

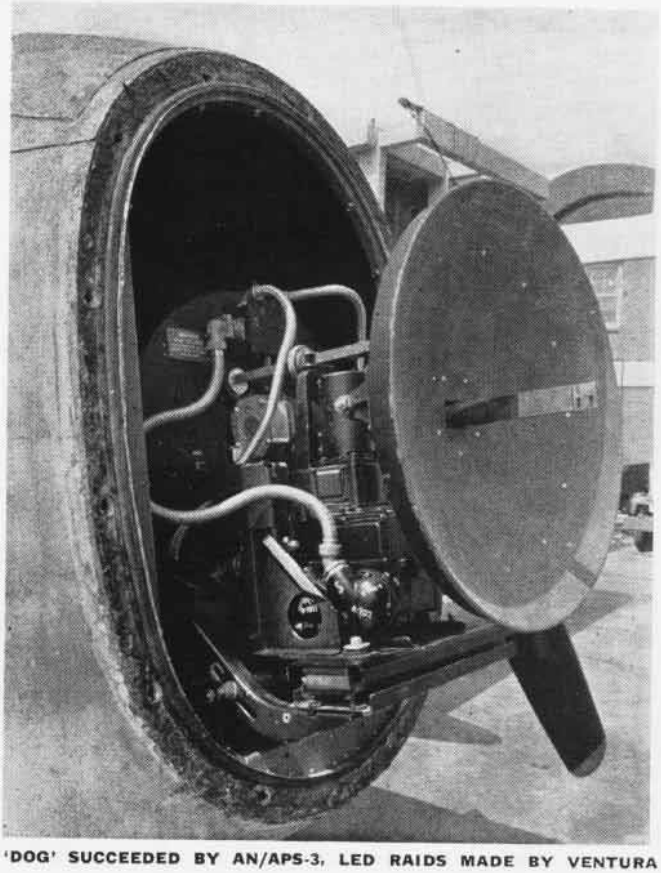
CAST HELPS PLAN RCM GEAR TO MAP AND JAM ENEMY RADAR

BECAUSE of *Cast's* requirement for skilled personnel, the activity's enlisted complement has turned the normal pyramid upside down—instead of having many seamen, a number of rated men and a few highly rated specialists. *Cast* has been staffed by a large number of high technical rates and comparatively few inexperienced men. Specialists in such fields as aircraft, propellers, hydraulics, instruments, bombsights, engines, radio, ordnance and Link training were requested for the unit, and some of the ablest were obtained for *Cast*.

It is one of the paradoxes of World War II that between mid-1944 and early 1946, virtually every experimental microwave radar equipment designed for naval aircraft has been flight-tested in the development stage at an Army airfield by naval personnel who had offices in an Army hangar, drank malts at an Army PX, and sometimes even borrowed Army aircraft.

That is the record of *Project Cast*, based from May 1944 until January 1946 at Bedford Army Air Field in the rolling country north of Boston. When *Cast* outgrew its previous quarters at the East Boston airport and needed a home near the Radiation Laboratory at the Massachusetts Institute of Technology and the Radio Research Laboratory at Harvard University, Army officers at Bedford took in the orphan activity.

The story of *Project Cast* goes back to 1940 when the Office of Scientific Research and Development began to establish laboratories for national defense, one of which was the Radiation Laboratory under contract with M.I.T. Charged with responsibility for developing microwave radar equipment, the Radiation Laboratory soon needed aircraft to test experimental designs. A month before Pearl Harbor, the Navy sent one pilot and a J2F-1 to NAS SQUANTUM to aid the scientists. Since one aircraft was insufficient, the laboratory borrowed planes "from anyone, any place" and finally obtained the loan of a JRB-1 from the Naval Aircraft Factory, based at East Boston with two NAP's as a crew.



'DOG' SUCCEEDED BY AN/APS-3, LED RAIDS MADE BY VENTURA

By the summer of 1942 the Bureau of Aeronautics saw that Radiation Laboratory's fast-expanding work would require extensive flight-test facilities and that the Radio Research Laboratory—established at Harvard earlier that year for development of countermeasures—soon would have designs ready for evaluation in the air. Consequently the Bureau assigned an SNB and additional pilots to NAS Squantum and, as a permanent solution, proposed that a "special project unit" be established in the Boston area to serve as an official flight-testing activity.

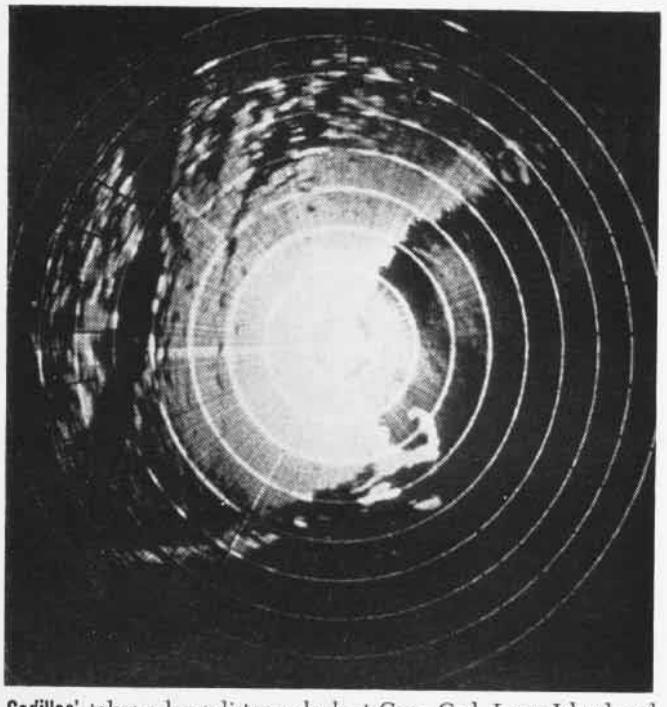
This unit, designated *Special Projects Unit Cast* (other BuAer testing agencies have taken such names as *Afirm, Baker* and *Roger* from the phonetic alphabet), was formally set up by a planning directive dated 24 May 1943 with a complement of 10 officers, 27 enlisted men and 8 aircraft. Activated on 12 June 1943 by the Commanding Officer of NAS Squantum, *Cast* went to work at the East Boston Airport under the administrative jurisdiction of NAS Squantum and with technical responsibility to BuAer.

Those were the days when flight-testing of *Dog* and *George* radar was being speeded, and *Cast* pilots piled up 176 flights, totaling 228 hours, in the first month. Soon another urgent call came to *Cast*, this time to help the Army.

Foreseeing the need for a radar bombsight to permit blind attacks on Germany in the winter ahead, the Army had asked the Navy if any suitable equipment were available. The Navy and Radiation Laboratory combined the best features of *George* (all-around search and a PPI scope) and *Dog* (higher frequency), added a new range unit to provide greater accuracy, and produced the equipment known as H_2X, later nicknamed *Mickey* by Army bombardiers.

Cast pilots speeded flight-tests of H_2X, after which hand-built models were hurriedly installed in 20 B-17's which were flown immediately to Europe to serve as "Pathfinders" in raids against the Reich. The new equipment then was placed in production and later became, as the AN/APS-15, standard equipment in naval patrol bombers, one of the most successful radars of the war.

With *Mickey* demonstrating that radar could serve as an offensive weapon as well as an instrument for search, scientists were spurred to a faster pace in developing new electronic devices for low-altitude blind bombing, toss bombing, night-fighter interceptions and countermeasures.



Cadillac' takes a long distance look at Cape Cod, Long Island and the Hudson River, on far left. Long Island plainly visible on the lower left and hook of Cape Cod and Nantucket Island, lower

Cast's Personnel Drawn from Electronics Aces

As a broad Navy program for countermeasures was established, *Project Cast* assisted in working out a complete RCM system for the new PB4Y-2 and in the development of anti-jamming techniques. *Cast* pilots also borrowed an Army *Black Widow* and flew it to simulate a Japanese airborne radar target in RCM studies.

Still another project was the proof-testing of GCA (ground-controlled approach) equipment that has since become popular among Army and Navy pilots. A *Cast* pilot, Lt. Bruce M. Giffin, USN, made the first completely blind landing in an aircraft "talked down" by ground controllers.

When almost snowed under by the blizzard of laboratory developments, *Cast* was given a larger complement—16 officers, 67 enlisted men, 17 airplanes. As heavy bombers assumed greater importance, facilities at the East Boston airport became inadquate. Then *Project Cast* moved to Bedford on 15 May 1944. Project personnel based at Bedford conducted tests in various parts of the country. In the expanding countermeasures program as many as five units were operating in the field at one time.

In mid-1944 *Cast* began work on its greatest single project—an electronic system which became known as *Cadillac* because early tests were conducted at Mount Cadillac, Me. With Radiation Laboratory scientists at work on designs, *Cast* became the clearing house for all information directly related to aircraft requirements. When BuAer decided to install *Cadillac* in a TBM-3, NAMC made the necessary aircraft modifications and *Cast* made the first flight test at Bedford on 5 August 1944. The original plane, an XTBM-3, is still at *Project Cast* after 348 hours of tests.

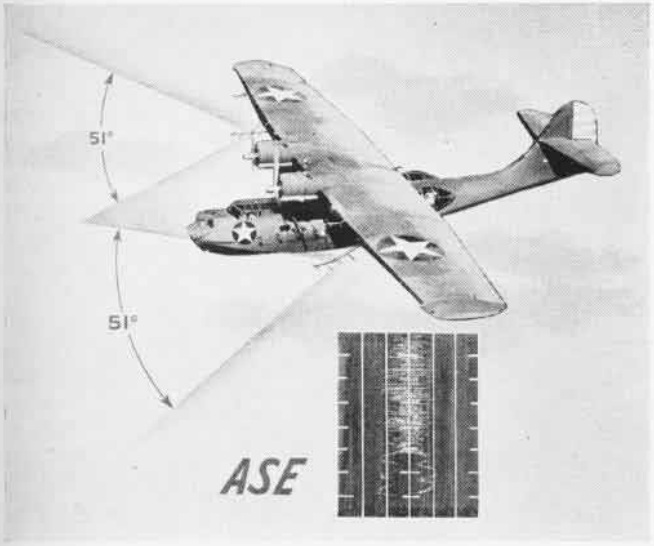
Following the Bedford flights, operating characteristics of the system were tested at the CIC Group Training Center, Brigantine, N. J., from February to April 1945. Again *Cast* personnel, temporarily based at NAS Atlantic City, flew the aircraft. When tactical tests were scheduled aboard the U.S.S. *Ranger* later in 1945, *Cast* pilots flew three TBM-3W's and spare equipment to San Diego, and *Cast* personnel who had worked in the Brigantine tests were transferred to ComFairWestCoast.

Late in the war, when work on *Cadillac* was at its height, *Cast* expanded to a complement of 115 enlisted personnel, including two WAVES; 23 officers, including 18 pilots; and 35 aircraft. Since V-J day the number has tapered off to 45 enlisted men, 9 officers and 13 aircraft.

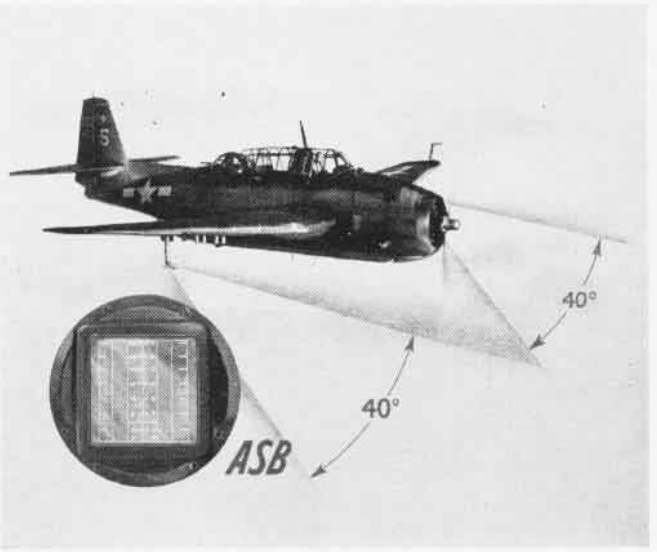
The latest chapter in *Project Cast's* history began late in January when the entire activity moved from Bedford to NAS Squantum. Although the wartime research activities of Radiation Laboratory and Radio Research Laboratory have ended, *Project Cast* is still needed to provide flight-testing facilities for the continuing *Cadillac* program and for other experimental projects. As in the past, *Cast* will maintain close relations with BuAer's Electronics Division (formerly the Radio and Electrical Group of the Engineering Division).

Looking back, *Project Cast* can share in responsibility for the success of almost all of naval aviation's most used microwave electronic devices. Looking ahead, *Project Cast* sees a future devoted chiefly to *Cadillac* refinements and to new electronic control systems for pilotless aircraft. Flying F6F, F7F and SNB aircraft, *Cast* pilots will help scientists study problems involved in the "electronic brains" now being designed to guide offensive and defensive pilotless aircraft in the new era of atomic energy and super-sonic speeds.

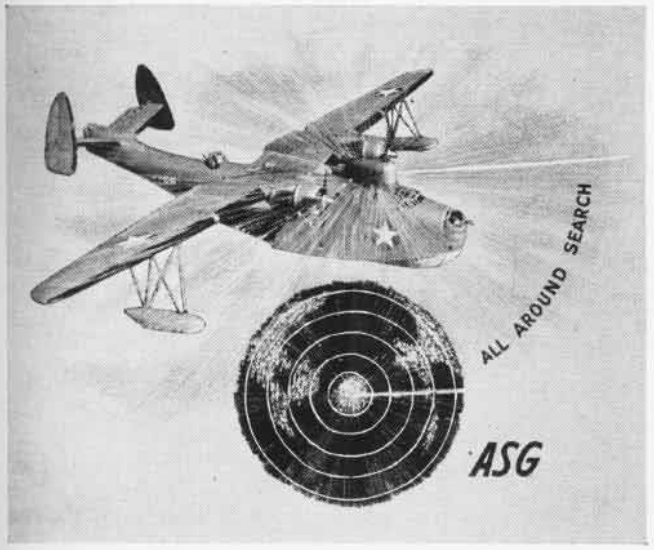
PROJECT *CAST* FLIGHT-TESTED MANY AIRBORNE RADARS DEVELOPED DURING THE WAR



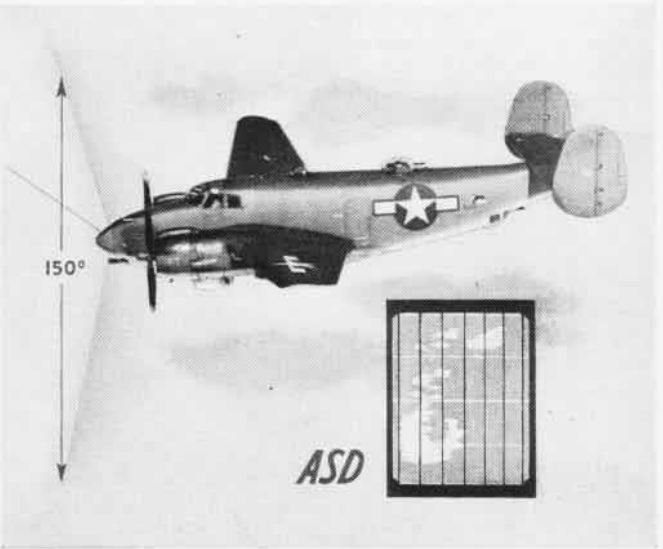
First U.S.-produced radar used in naval aircraft was *Easy*. Widely-used in Aleutians and SoPac, it was heavy, gave azimuth check



To enable carrier aircraft to use radar, NRL designed lightweight *Baker* with higher frequency, smaller antenna than *Easy*-type gear

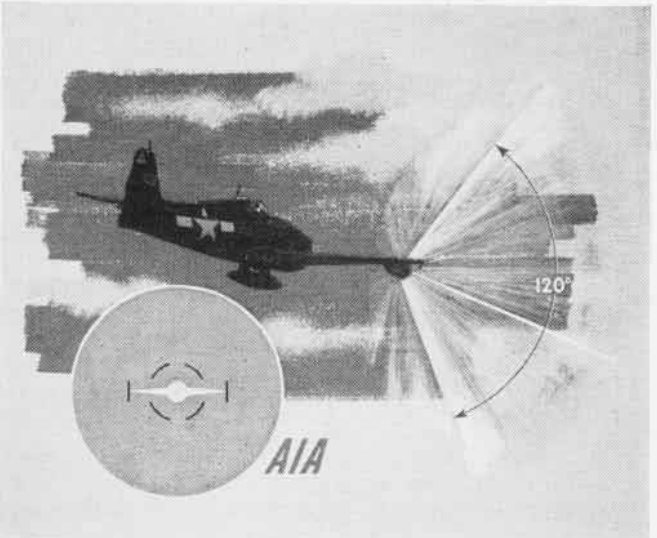


Needing a high-frequency radar to pick out submarine conning towers, Navy procured *George* with all-around search and PPI



Dog radar was valuable for aiming bombs and torpedoes, as well as search and navigation. B-type scope covered conical area ahead

To permit bombing in foul weather, Navy combined *George* and *Dog's* best features to produce *Mickey*. It was Jap ship scourge



First U. S. radar for night-fighters, AIA saw action at Rabaul and Kwajalein, helped VF(N)'s down 91 Japs in 9 weeks at Okinawa

GRAMPAW PETTIBONE

Disorientation on Takeoff

Case 1. Immediately after a night takeoff an R4D disappeared into a rain squall. A few seconds later local residents saw a blinding flash as the plane crashed into the water. The engines sounded as though they were operating normally.

Case 2. An FM took off in a very dark night. Altitude was gained in a normal climb until the plane reached about 400 feet. Then the lights were seen descending in a rather steep spiral. A violent explosion was observed as the aircraft crashed into the ground without any apparent effort to recover from the spiral. There was no evidence of material failure.

Case 3. A TBM flew into the ground approximately one-fourth mile beyond the end of the runway after taking off into a very dark night. At the time of the crash, the plane was in a shallow turn. The one surviving crewman recalls no indication of power plant malfunctioning.

Case 4. Following a night carrier takeoff, a fighter flew into the water. The pilot was recovered. He believes he may have lost orientation while looking for the switch to turn off his recognition lights.

All available evidence indicates that pilot disorientation was the cause of

these accidents. Disorientation during takeoff at night or other periods of reduced visibility continues to account for a large number of fatalities in aviation accidents. Nearly all cases are due to one of the following errors:

(1) Failing to go on instruments immediately upon becoming airborne from runway or carrier.

(2) Operating some switch or auxiliary control and unconsciously applying forward pressure on the elevator control.

(3) Trying to fly part contact and part instruments.

(4) Trying to fly by reference to a single light, the position and plane of which have not been definitely established.

On takeoff when the horizon is obscured by darkness or overcast, go on instruments immediately upon becoming airborne. Don't fool around, hoping that you will fly through the "stuff" before it is necessary to go on instruments. A lot of guys already have proven this a dangerous practice; the fatality files are full of such examples. The instant you leave the ground, go on instruments. Thereafter, *assume* and *maintain* a *safe* rate of *climb through instruments.* Do not make any unnecessary turns and do not operate any auxiliary controls, switches, radio, etc., until certain that you are at least 500 ft. above the terrain or water. Even then, care is necessary to prevent a dangerous attitude. It doesn't take much to change the sensitive balance of a heavily loaded aircraft. Altitude can be lost very qucikly and you don't have much to spare on takeoff.

When suddenly you leave the carrier or field lights and fly smack into that "black stuff", it's easy to let things get away from you if you are not prepared. If it does happen to sneak up on you, don't get panicky or try to fly part contact and part instruments; go completely on instruments immediately and you'll be O.K. Don't try to orient yourself by other lights unless their identities have been definitely established. They may be either on the ground or in the air.

[Flight Safety Bulletin 10-45 should be carefully read by all pilots.]

A Fine Example

After several unsuccessful attempts by the mechanic to spin the prop, the pilot (a Flight Safety Officer) got out of the *Cub* cockpit to show "how it was done". He left the switch on and the throttle open. His technique was so good that the engine caught on the first try and the plane leaped forward. Fortunately, he and the mech managed to side-step the little plane as it sped by them. A mad chase ensued, ending as the *Cub* crashed full tilt into a parked plane.

In writing up his report, the Flight Safety Officer suggested that such accidents could be avoided if chocks were placed under the wheels before starting engine.

Grampaw Pettibone says:

A noteworthy observation, my friend, but how about regulations already in effect? BuAer Manual, Art 11-101, states:

"Under no circumstances shall engines be started without a *competent person at the controls. Wheels will be chocked.*"

HELLCAT PILOTS!

Attention of all F6F pilots is invited to the detailed analysis of accident hazards facing *Hellcat* pilots contained in the January issue of the *Naval Aviation Confidential Bulletin,* No. 1-46, CONAVAER-00-75-500.

PILOTS CAN RELY ON THESE ROCKETS →

THE FIGHTING *war is over but know-how still counts when it comes to the servicing and maintenance of aviation ordnance equipment. Just before a training strike, an aviation ordnanceman aboard the U.S.S.* Midway *gives a final check to a* Corsair's *load of 3.5" rockets. Circuits are checked before rockets are loaded. When the two inboard pigtails are connected, the rocket load on port wing will be ready for firing. Installation shown is an early modification of the Mk 5 aircraft rocket launcher. Later installations have been modified in accordance with* Aircraft Armament Bulletin No. 45. *Maintenance and operational techniques learned in Navy technical schools are kept up to date working with latest ordnance equipment at either Fleet or shore based activities.*

Down and Locked

Just flicking the switch or shoving the lever down does not insure that your landing gear will extend and lock every time. Granted, it should; but it doesn't, as hundreds of pilots each year can testify. Occasionally a part gets out of adjustment due to poor maintenance, wear, or breakage, thus preventing the gear from lowering and locking.

In response to "Landing Gear Dawn" on your landing check-off list, don't just put the cockpit control in the "down" position and forget about it. ALWAYS CHECK to see that WHEELS are DOWN AND LOCKED!

Too Close

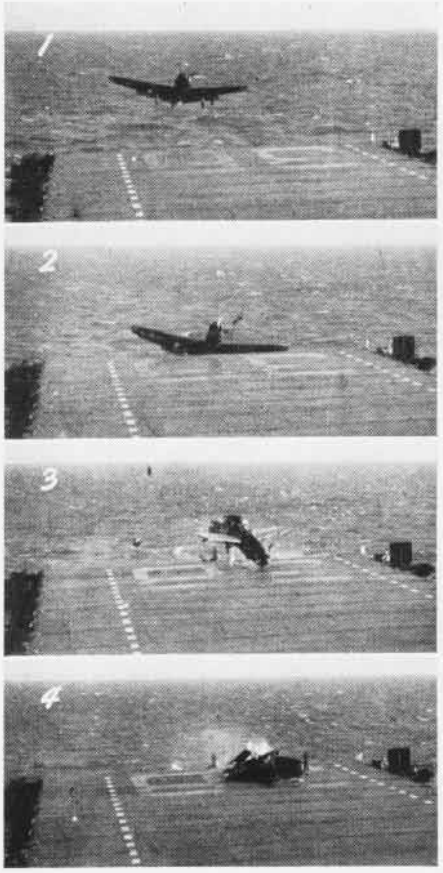
During a night three-plane formation training flight, the #3 plane, piloted by a student, apparently got "sucked in" behind the leader (instructor). The student lost control in the slip stream resulting in a collision and the death of two men. The Investigating Board attributed the underlying cause of the accident to insufficient interval on the part of the student.

It was found that this particular instructor had requested his students to fly a close formation at night. Apparently it was his idea that night formations were to be flown closer than day formations.

● The Board recommended: "That more emphasis be placed on comprehensive briefing of both instructors and students to insure compliance with night syllabi, rules and regulations."

● The Convening Authority said:

"It is evident that this accident was caused primarily by the formation getting too closed up. As a result of experience in the training command, the standard formation distance has recently been increased from fifty to seventy-five feet. Had this distance been observed, with any error being on the side of greater distance rather than less, as was the case here, the likelihood of such an accident would have been materially lessened. . . ."



These striking pictures show what happened when an SB2C pilot got low and slow in the groove and failed to respond properly and promptly to the LSO's signals. A last second burst of throttle pulled the plane almost up on deck where it crashed the ramp in the manner shown.

Believe it or not, the pilot was not injured: another example of the life-saving value of the shoulder harness.

Follow Me

While leading an aircraft to the parking area, "a follow me" jeep experienced engine failure. The driver stopped his vehicle on the runway directly in front of the oncoming airplane and out of the pilot's line of vision. Leaving the jeep, the driver ran toward the plane, holding the emergency stop signal. Upon suddenly coming into view of the signal, the pilot immediately applied brakes, nosing the plane up.

To reduce the likelihood of other similar accidents in this squadron, the Executive Officer promulgated the following instructions:

"1. When intercepting an oncoming aircraft to lead it either in or out, the driver will make a 'U' turn in the nearest and most convenient hardstand. If there is no hardstand available, make the turn 400 feet ahead of the plane and in such a manner that you never lose sight of the pilot. Then allow the aircraft to catch up with the taxi jeep. Never let the jeep get out of the pilot's vision.

"2. Aircraft are not to be led at a speed greater than 20 miles per hour. Any plane that insists upon taxiing faster than 20 miles per hour shall be reported to the operations officer.

"3. All new or inexperienced taxi jeep drivers shall be checked out in all phases of their job by the Operations Officer himself, before taking it over."

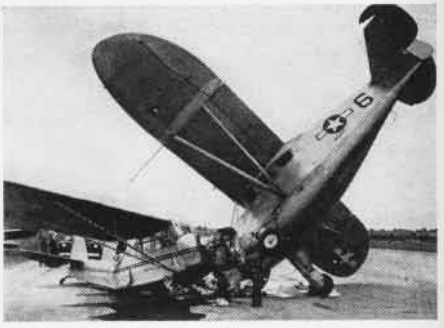
▶ ***Comment:*** **Drivers of automotive equipment, unless specifically indoctrinated as to the limitations of aircraft on the ground, cannot be expected to know these limitations. They do not realize how poor the visibility is from the cockpit, the lack of maneuverability on the ground, or the distance needed to stop an aircraft on the ground. It is the responsibility of the Operations Officers and their assistants to insure that these drivers are instructed.**

All *PILOTS* are cautioned to remember the limitations of the drivers of "follow me" jeeps bearing in mind that all drivers may not yet be indoctrinated with the foregoing instructions.

Flight Safety Bulletin 16-45 contains a comprehensive breakdown of the causes of most taxiing accidents and should be read by *all pilots and plane directors.*

This collision resulted when a pilot failed to check visually the traffic and tower before taxiing onto the runway. It happened like this:

The GH pilot was cleared by tower radio to land. In his turn into the groove, the GH pilot saw the Taylor-



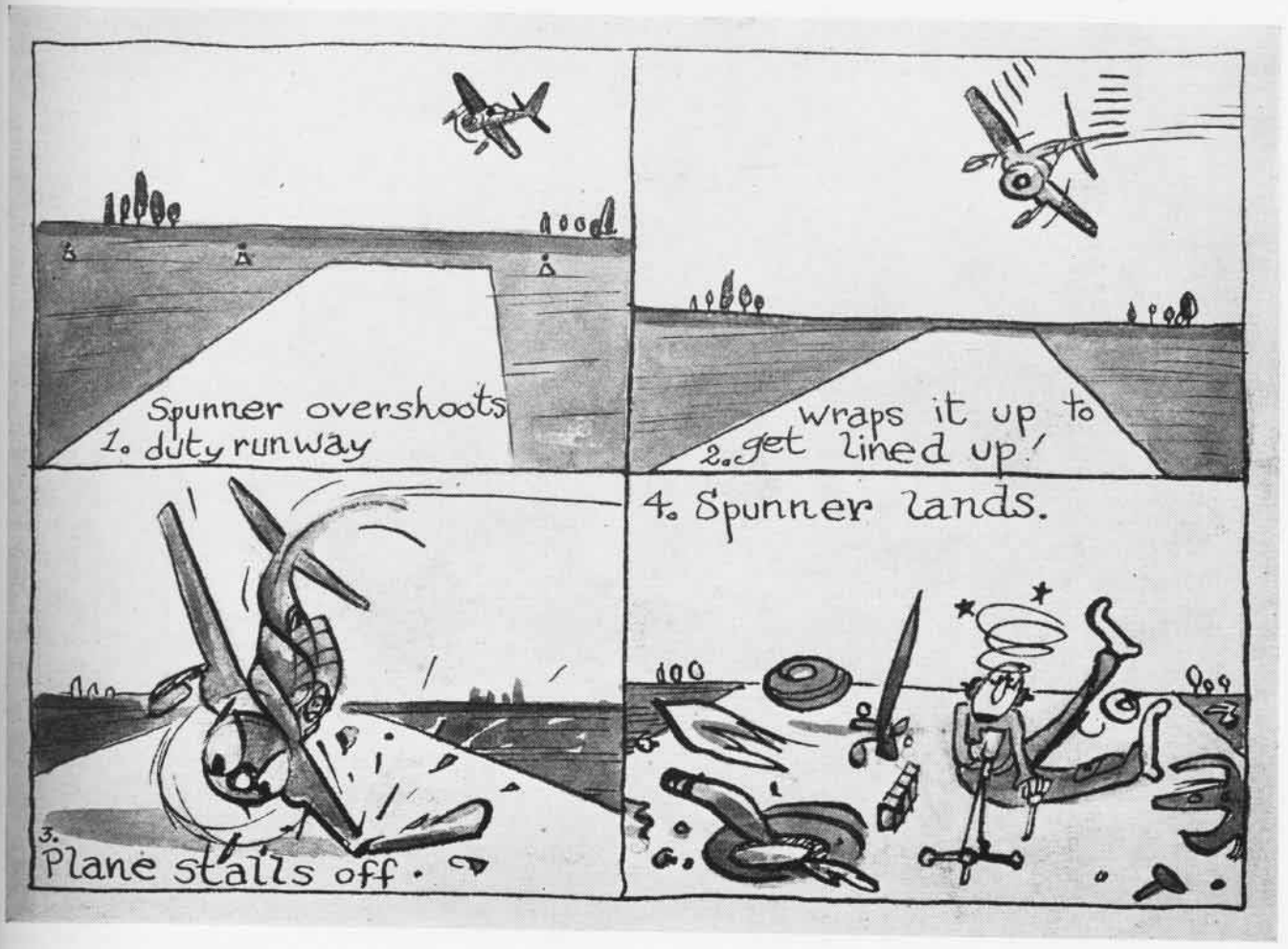
craft "holding" on the taxiway at the upwind end of the runway. The GH then landed.

In the meantime, the Taylorcraft pilot proceeded onto the right side of the runway and began taxiing downwind toward the take-off position. He apparently did not see the approaching GH nor the red light being given him by the tower. The Taylorcraft was not equipped with radio. Neither pilot saw the other aircraft until an instant before the collision when the GH was in the last stage of its landing runout. The Taylorcraft pilot was killed. The cause was assigned as 100% pilot error on the part of the deceased.

GRAMPAW'S SAFETY QUIZ

1. **Ground checking of magnetos should be made with the propeller pitch control set in what position?**
2. **When should alternate air be used?**
3. **In a dive or glide bombing run is it necessary to start a pullout immediately after release?**
4. **Are check-off lists required in all Navy planes?**
5. **Do regulations make the wearing of shoulder harness mandatory?**

(Answers on Page 40)



Lieut. (jg) SPUNNER

Moral: *Steep Turns near the Ground Are Dangerous*

FLIGHT SAFETY

ACCIDENTAL spins don't just happen: pilots who forget what they were taught throughout flight training cause them. Any airplane will stall when airspeed falls below that required for the given attitude of flight.

Most stall-spin accidents occur during landing approaches. To illustrate, let's take the typical case of Lt. (jg) Spunner. On the crosswind leg of his approach to the field, he turned too late and found himself overshooting the runway. Up to this point he had ample flying speed for his attitude of flight. He then tried to line himself up with the runway by means of a 50° banked turn. Here's where he made his mistake, for when he steepened his turn, he increased his "g" factor which, in turn, raised the stalling speed. He then had insufficient airspeed to compensate for this new wing loading, and midway in the turn the airplane fell off into a spin. Cause of this crash was poor judgment and poor technique. The pilot made too violent a turn too slowly. When he found himself overshooting the groove, he should have gone around again.

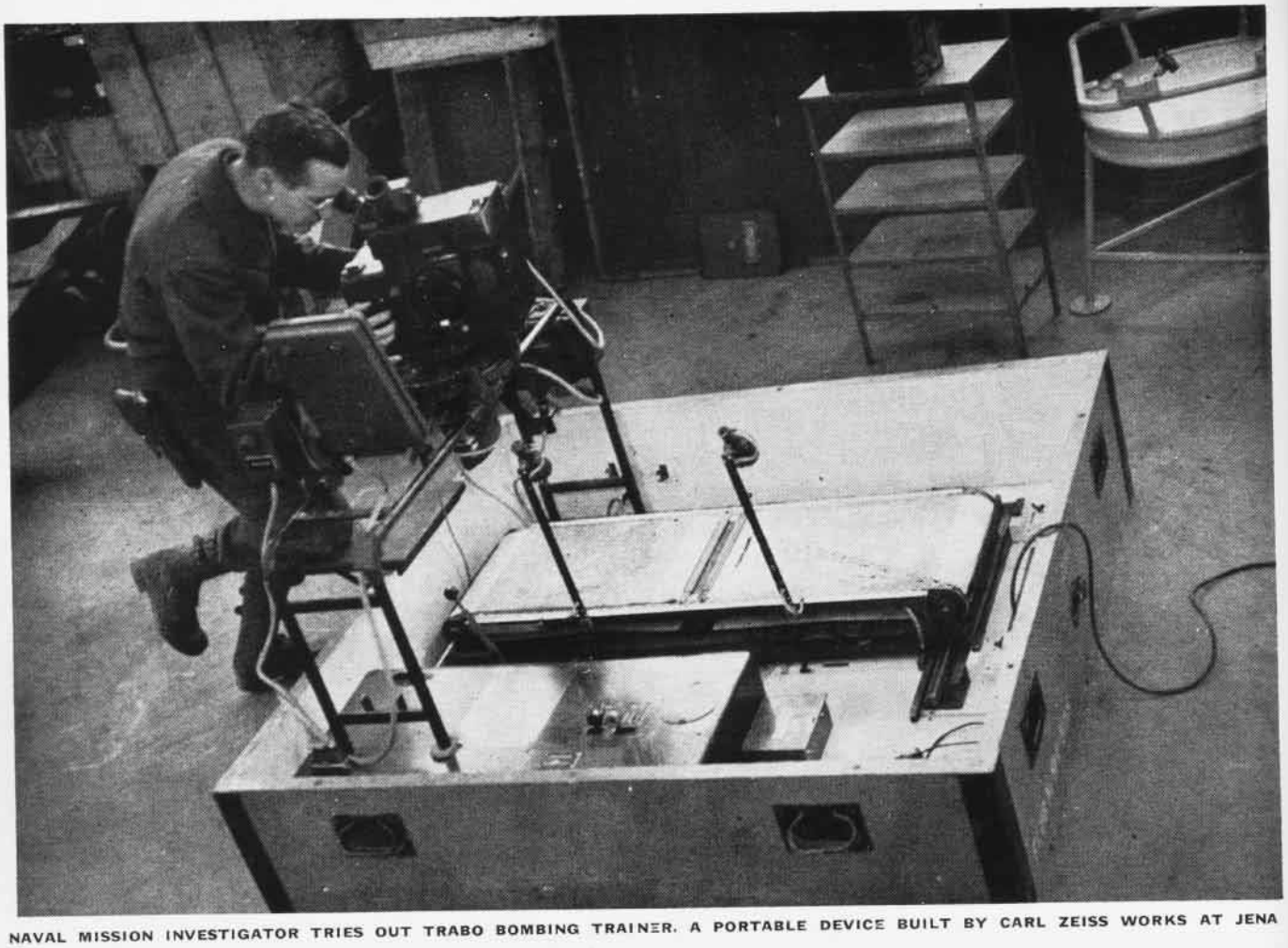
Pilots all know that a plane will stall at a higher air speed when fully loaded with fuel, bombs or ammo, than when it is very lightly loaded, because of the higher wing loading of the heavily loaded airplane. Exactly the same effect can be accomplished by applying acceleration "g" to the aircraft in a banked turn or pullout. The reason for this is clear, but the facts are apparently not understood by all pilots. THE NORMAL STALLING SPEED REFERS ONLY TO UNACCELERATED FLIGHT. When the wings are called on to support more than the gross weight of the plane, as in a banked turn or pullout from a dive, the stalling speed is increased exactly as if the gross weight had been increased. For example, if your plane has a normal stalling speed of 70 knots, the same plane will stall at 140 knots in a 4 "g" or 75° bank turn.

To avoid a spin during landing, carefully plan your approach, keep plenty of flying speed, avoid slipstream, and NEVER MAKE STEEP TURNS. If you overshoot the groove, stop your turn, apply throttle gently and go around again. Corrective action for a stall warning at low altitude must be fast and positive. Remember that applying full throttle aggravates the situation by adding torque at a critical moment.

It is sound practice and good insurance to *get in the habit* of turning early and easing off on the turn as you approach the windline.

Be sure you have enough flying speed to provide for the increased stalling speed created by banks or other maneuvers that impose greater than normal loads on your plane. Overlooking this simple fact, even for a moment, may cost you your life. Don't stall. Don't stall. DON'T STALL!!!!!

An excellent picture embodying these salient points is the *Spins and Stalls* flight safety film, MN-4353 (a).



NAVAL MISSION INVESTIGATOR TRIES OUT TRABO BOMBING TRAINER. A PORTABLE DEVICE BUILT BY CARL ZEISS WORKS AT JENA

NAZI AIR SYNTHETIC TRAINERS

UNITED STATES was ahead of Germany in the use of synthetic devices for training aviation pilots and crewmen, the Nazis apparently failing to grasp the real value of such devices, according to a report by the U.S. Naval Technical Mission in Europe.

"It can be stated that the potentialities of synthetic training were not fully appreciated by the German armed forces and that existing German synthetic training equipment shows in general a lack of understanding of the basis upon which all such devices should be conceived," the report said.

Studies were made of training methods and equipment at Erfurt, Kothen, Halle, Merseburg, Gottingen, Celle and Braunschweig. Manufacturers of training equipment like Zeiss, Leitz and Schneider were visited.

None of the trainers found would be of immediate value to American armed forces since most apply to German-type planes or equipment and the balance are inferior to devices already in use by the Navy, the mission found. Nazi devices in many cases were of good quality, but were not used properly or were too complex to be economical.

Training devices, to be of any worth, must develop the mental agility, physical skill, or as in the case of crew trainers, cooperation between two or more persons. They must have a low man-hour cost of production and not require critical materials. They should afford as much illusion as possible and include distractions and difficulties encountered in combat. Scoring, competition, variety and even amusement are greatly important. The student should know at once how he is doing.

The device should afford a means of charting the progress of the student, of stopping the problem for explanations and of varying the problem as enemy technical advances, tactical changes or counter measures are developed.

Both Germany and the Navy used a spotlight on motion picture trainers so students could tell their aiming point. The German light incorporated a four-element optical system and many accurately machined parts, and required 450 man-hours to produce. The U.S. spotlight, of molded plastic with a single element lens, took two-man hours and does the job just as well.

THE GERMANS had a star recognition training device made by Zeiss which was a miniature planetarium, taking 3000-man hours to build. The Navy's equivalent—a hollow sphere, a large umbrella and an electric light—took 50 hours and no critical materials. A German model for convoy tactics training took the overworked Zeiss plant 10,200 man-hours to build while the Navy's device, turned out by a former pinball machine manufacturer, took 2000 hours, although it incorporated several additional features as well.

Lack of illusion made many German devices worthless, including one to

turn out "pilots" for guided missiles. A small electrically-propelled carriage supported a mast from which was suspended a ball on a string. Climb and dive were simulated by hoisting or lowering the ball, to hit some target hung from a stationary bracket. "The total lack of illusion defeated the purpose of this trainer," the mission said.

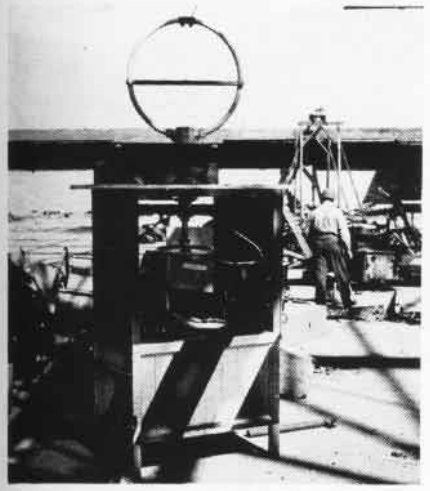
Another device, the *Trabo*, illustrated opposite page, was a portable bombsight trainer which had to be developed when Germany's large and complicated Hydegerat and Schwabach trainers had to be abandoned because of bombings. The *Trabo* used a small aerial photo as a target, moving it a few inches below the modified bombsight. It was portable, but was more a bombsight manipulation trainer than a complete bombing trainer.

The Germans tried to develop a dive bombing trainer, using the conventional Link as the vehicle. The Navy abandoned this particular idea because no synthetic device could approximate the flying problem of dive bombing.

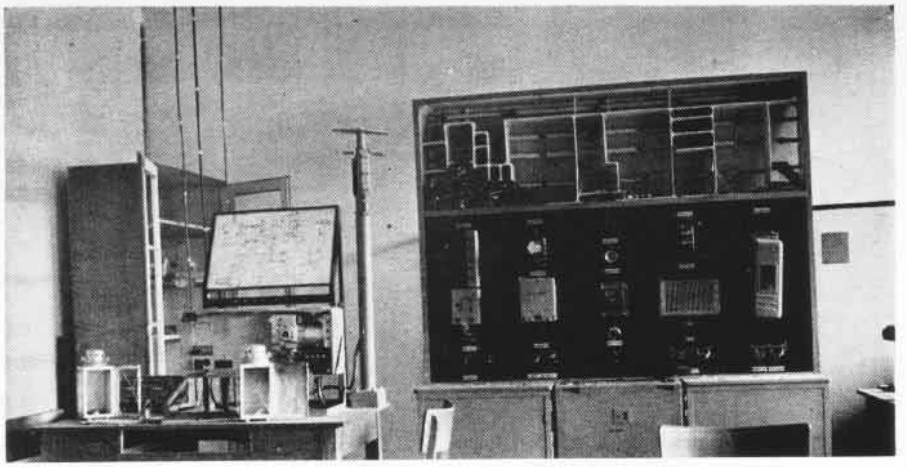
One advantage to a training device is that the student knows at once how he is doing or what score he is making. The Germans had two antiaircraft gunnery and range trainers which were elaborate setups but did not produce the student's score for many hours or even days after he had finished shooting and long after he had forgotten just what he did. Motion pictures had to be developed to assess his score.

The Germans had a free gunnery trainer somewhat like the Navy's 3-A-2. The student manned a dummy gun and "shot" at images projected by movie machines. The German device, in addition to taking up more space, was unable to indicate to the student what he should do to correct his aim, as can be done with the 3-A-2.

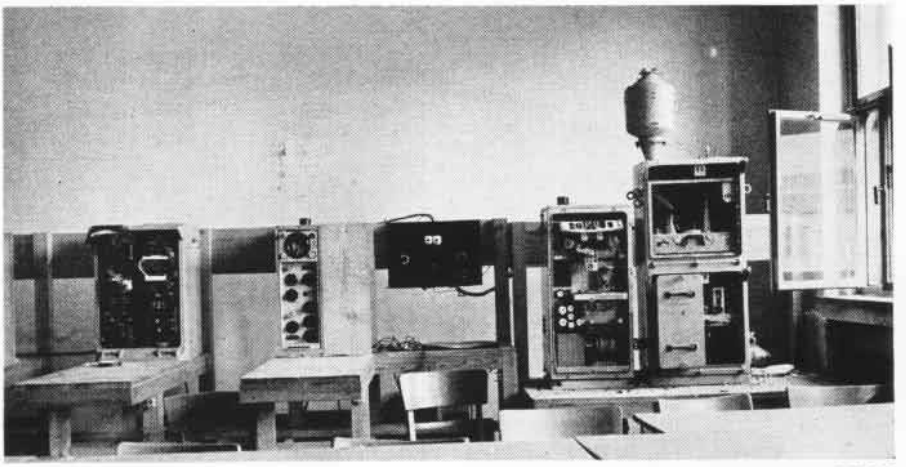
Training devices which require large maintenance crews are not successful unless they afford training that cannot be achieved in any other manner. Keeping the crews together and difficulties of obtaining and training them must be met. One German flak gun crew device required four or five skilled operators and two technicians to analyze four movie films. Most German synthetic devices, however, seemed to be ruggedly constructed from soundly engineered designs, the mission said.



DF TRAINER TO TEACH NAZI RADIOMEN



TEST PANEL, RADAR ANTENNA AND OTHER GEAR IN RADAR SCHOOL AT KOTHEN, GERMANY



CUTAWAY RADAR OPERATIONAL EQUIPMENT USED IN SIGNAL SCHOOL TRAINING AT HALLE

THROUGHOUT the German armed forces, excellent use was made of training aids. In flight schools, oversize aircraft instruments were used to explain their operation and construction. Oversize radios, cutaway bombs, mines and engines were found in abundance. In government-owned factories, schools trained slave labor with cut-away props, engines and carburetors. Actual operating gear, such as the radio and radar installations illustrated with this article, were much used for training.

Radio and instrument repairmen were trained with four-times oversized instruments that they tore down and assembled before working on ordinary equipment. Bombsight repairmen and automatic pilot mechanics got training from bombsights and auto-pilots installed on the Link trainer unit.

The Navy mission declared "it is interesting to note that even at the end of the war development of synthetic training equipment still was being sponsored by the German Air Force and Navy. . . . One of the factors, which had an adverse effect on German developments, was the fact that there was no central agency responsible for design of this type of equipment.

"For example, aerial fixed-gunnery trainers were developed entirely separately from free-gunnery trainers. The mistakes made by one branch of the service frequently were repeated at a later date by another branch."

The mission's investigation of German synthetic training covered a 2000-mile trip through the country and included information from prisoners of war and other intelligence sources, as well as visits to training centers and factories. Another phase of the mission's work investigated trainers for operators of guided missiles such as flak rockets, high angle bombs, glide bombs and air to air bombs. The devices cover a wide range of complexity. Some models were sent back to Special Devices Division, Office of Research and Inventions, for analysis by technicians.

FILMING A WINNER


STEICHEN AND LONG

HAD IT not been for on-the-job gun camera developments, alterations and installations, the Navy's documentary motion picture "Fighting Lady" might never have been filmed. Without them, it most certainly would not have won a 1945 Motion Picture Academy Award or have been voted an Award of Merit by the New York film critics.

The stories of those gun camera developments as they occurred during the filming of the wars' outstanding documentary carrier picture, as related to NAVAL AVIATION NEWS by Lt. Comdr. Dwight Long, USNR, who under supervision of Capt. Edward J. Steichen, directed the actual filming and production of "Fighting Lady", follows:

"Captain Steichen had given me orders, that were broad in scope, to photograph the war. On 14 April 1943 our crew, two enlisted men and myself, reported to the U.S.S. *Yorktown*.

"All F6F's in the *Yorktown's* airgroup were fitted out with gun cameras hooked up to the six .50-caliber guns. After running some tests we found these cameras were mounted at such an angle that when a run was made on a target the horizon was perpendicular, up and down the center of the frame. This necessitated constructing new mounts.

"We found that the very small openings in the leading edge of the wing were small, so a section of the skin had to be removed. After numerous tests altering the camera mount 90° and experimenting with shock rubber mounts, we found a workable base. As a Bureau modification would take too long, we constructed three dozen aboard ship, mounted them in time to record the first *Essex* class carrier strike against Marcus Island in August.

"After processing our Kodachrome at Hawaii, we found our combat scenes too short and too jumpy, for when the six .50-calibers went off they shook the camera all over the place. We made further improvements in the mount back at Barbers Point prior to the Wake Island raid of November 1943. At Barbers Point we learned of an overrun device the Army was using that was hooked up in tandem with the camera and could be adjusted to run the camera three seconds after guns stopped firing.

"At Wheeler Field we borrowed one of these overrun cameras and had it mounted in an F6F just prior to the Wake operation. Three weeks later we had the overrun cameras' film developed and procured our first movie in color of shooting down an enemy.

"Back in the States the scene of the Jap *Nell* blowing up served as a selling point for the purchase of gun cameras with overruns. One hundred of these cameras with overrun units were procured from the Army and flown to Pearl Harbor. Most of the installations in the F6F's of Air Group Five were made aboard the *Yorktown*.

"We rigged gun cameras under the wings of SBD's and hooked them up to a switch that tripped off the camera when the diving flaps were opened. Gun cameras mounted on the .30-caliber stinger gun of the TBF recorded hits on enemy airports and shipping.

"As we lost fighters, we lost our precious overruns. In the Second Battle of the Philippines in one day we lost 46 cameras."

Seventy-five percent of the film "Fighting Lady" was taken aboard the *Yorktown*, 15 percent aboard the *Hornet* and 10% on the *Ticonderoga*.


EVERY PLANE ON FLIGHT DECK WAS RIGGED WITH CAMERA TO RECORD COMBAT

DID YOU KNOW?

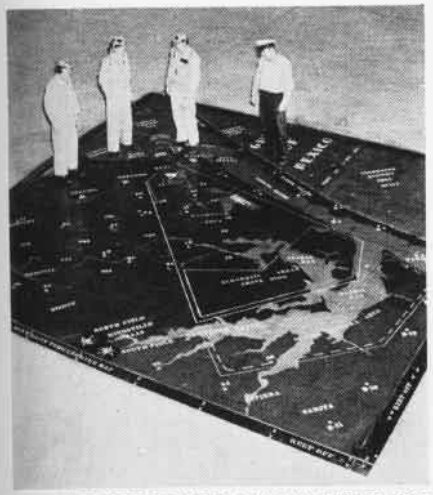
Hangar Deck Map Aids Students

Chart Speeds Up Area Familiarization

NATB CORPUS CHRISTI—Student pilots undergoing training always have experienced difficulty on their first flights in becoming familiar with the squadron operating area. The practice has been to give each student a back seat familiarization flight with an instructor in the front seat to point out all operating areas and auxiliary fields. This flight, with a written course rule examination, has been employed to acquaint students with the operating area. Because too few students have photographic minds, that method has not proved entirely satisfactory.

To cope with the problem, VN14D8-A, a CV intermediate training squadron at NAAS RODD FIELD, constructed a map of the entire NATB area. The map, drawn to a scale of six inches to one mile, took 10 days to complete, and was painted on the hangar deck. It is 20x20 feet and shows the entire Corpus Christi area.

Students are briefed before each flight and correct operating areas are carefully pointed out on the map. The



STUDENTS ARE BRIEFED BEFORE THEIR HOP

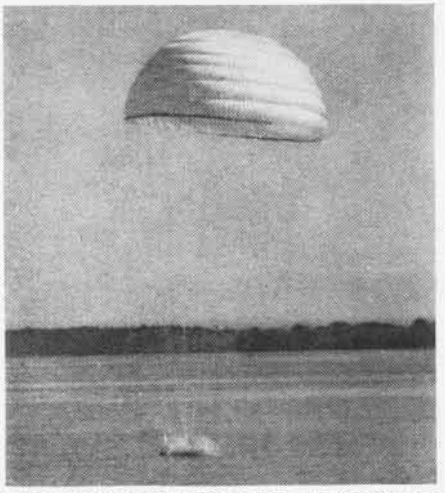
training squadron that designed the area chart has not had a student lost or put on report for being out of his area since the map was painted.

Navy Tests German Parachutes

Ribbon-Type Used by Fighter Pilots

The Navy and Army are conducting tests on the German ribbon-type parachute designed for jet fighter pilots. This 32-foot parachute differs from the conventional chute in that the canopy is constructed of two-inch ribbons spaced a short distance apart in lieu of fabric sewed together to form a solid or continuous surface.

The ribbons are secured along radial seams only which, with spacing between adjacent ribbons, provide free



CHUTE BEING TESTED NEAR JACKSONVILLE

air escapement to reduce or cushion the shock of opening. The chute was developed by the Germans for use from jet-powered or other high-speed airplanes equipped with ejectable seats.

The ribbon parachute is considerably heavier and more bulky than the present standard parachute. Available results of preliminary study indicate that the ribbon parachute opens much slower and descends much more rapidly.

Navy Observers on Arctic Trip

Operation Musk-Ox Tests Survival Gear

Two Naval observers are accompanying *Operation Musk-Ox*, an 80-day experimental military trek by snowmobile across the trackless Northern Canadian wilds, to study how Navy survival gear stands up under sub-zero conditions.

Sponsored by the Canadian Army and Royal Canadian Air Force, the operation got underway in the middle of February from Churchill, Manitoba, with Lt. Cdr. M. C. Shelesnyak (MC) accompanying the ground party and Lt. R. J. Willingham, representing BUAER, with the air supply unit flying *Dakotas*. The party of 42 Canadians and 5 Americans is scheduled to end its 3,000-mile loop trip May 5, returning by the Alcan highway.

Objectives of the trip, so far as the Navy is concerned, are to test cold weather survival gear and clothing, such as life rafts, electrically-heated suits, heavy underwear, sweat suits, quick-donning and continuous-wear exposure suits, signaling equipment, rations, and droppable kits.

The party will look into methods of air supply of military operations, including the possibility of establishing temporary landing strips on barren ground. Before starting the trek, it went through indoctrination training in Arctic life at Churchill, taking several-day trips by snowmobile.

Marines Study Bail-out System

Best Method of Getting Out Is Sought

MCAS CHERRY POINT—Studies of plane escape procedures and hazards provided by various types of aircraft and equipment are being made here under auspices of the Aviation Safety Board on request of BuMed.

Exhaustive tests will be conducted to secure information of average time involved for escape from plane, of diffi-

THIS PILOT HEADS TOO FAR OUT ON WING

culty either from cockpit construction or equipment worn by pilots, most rapid methods, and indicated modifications in clothing and planes.

The research is expected to provide important information preparatory to establishing training and operational procedures for bailing out. All types of aircraft used on the station will be used.

Tests will be given by jacking up various type planes in flying position and taking time tests for escape under basic conditions: normal, cockpit filled with smoke, or the motor revved up.

BEST ANSWERS

Jet Jobs

1. **The present world speed record of 606 m.p.h. was set November 7, 1945 by an officer of the—**
   - ☐ *a*–U. S. Army, flying a Lockheed *Shooting Star*
   - ☐ *b*–British Naval Air Arm, flying a deHavilland *Vampire*
   - ☐ *c*–RAF, flying a Glouster *Meteor*
   - ☐ *d*–U. S. Navy, flying a Ryan *Fireball*

2. **At speeds approaching that of sound (760 m.p.h. at sea level under standard conditions) compressibility may cause a plane to shock stall. Then the pilot—**
   - ☐ *a*–can control it in the same manner as a power-on stall
   - ☐ *b*–can do nothing about it
   - ☐ *c*–will not be aware of the stall
   - ☐ *d*–will blackout

3. **The U. S. Navy's latest jet plane designed for carrier use is the—**
   - ☐ *a*–Ryan *Speedball*
   - ☐ *b*–McDonnell *Phantom*
   - ☐ *c*–Vought *Comet*
   - ☐ *d*–Grumman *Devilcat*

4. **The 19B axial flow propulsion unit which powers the Navy's new fighter operates at 18,000 rpm. and develops 1,700 hp. at 550 m.p.h. Its weight as compared with a reciprocating engine of equal power is about—**
   - ☐ *a*–the same
   - ☐ *b*–half as much
   - ☐ *c*–a third as much
   - ☐ *d*–twice as much

5. **Most of the jet propulsion units used in American planes are manufactured by—**
   - ☐ *a*–Allison and Packard
   - ☐ *b*–G-E and Westinghouse
   - ☐ *c*–General Motors
   - ☐ *d*–Pratt & Whitney

6. **On Nov. 6, 1945 the first jet carrier landing was made by the—**
   - ☐ *a*–British with a *Vampire*
   - ☐ *b*–U. S. Navy with an FD-1
   - ☐ *c*–U. S. Navy with an FR-1
   - ☐ *d*–British with a *Meteor*

(*Ans. on pg. 40*)

"It has something to do with jet propulsion"

Flying Off Snow-covered Field

Canadians Use Grass Area for Landing

Methods used by Trans-Canadian airliners to operate on snow-covered landing fields may be of interest to Naval activities faced with snow conditions.

Fields described in a report by Lt. Comdr. M. C. Shelesnyak, Naval observer on exercise *Muskox*, were Kapakasing and Armstrong, Ontario. The field and runways were handled as follows:

Because of snow all winter long, snow clearance as such was not attempted. . . . Instead, the hard surface runways are not used, but grass strips paralleling them are prepared. The method consists of leveling drifts and packing the snow with a three-unit tandem of heavy steel corrugated drums about 15 feet wide and 3½ feet diameter. Each weighs about one ton and the three are hitched one and two with about three feet overlap. In front of the drums is an adjustable three-rung scraper (actually leveler), since it is not in contact with the ground. A caterpillar tractor is used for power.

The effect is a well-packed, finely-groomed runway, and from a passenger's point, the landings were easily handled. Even rather sudden braking on a fast turn seemed to stick. In this method care must be exercised not to overpack, especially in cold weather (−20° to −30° F.), because this pulverizes the snow.

Also at both fields, the hangars had a canvas duck tarpaulin hung the full height and width of the hangar about five feet behind the hangar doors. This was an effective cold-lock, even with part of the hangar door open.

Marines Open Technical School

Quantico Gives Advanced Air Training

MCAS QUANTICO—The first aviation technical school of its kind to be instituted by Marine Corps aviation has been launched, using the A&R hangar at Brown Field.

Advanced training courses are given in aircraft engineering and maintenance, ordnance, camp construction and maintenance, parachutes, communications and naval supply and accounting. Aviation fundamentals are taught students having no aeronautics background prior to taking those courses.

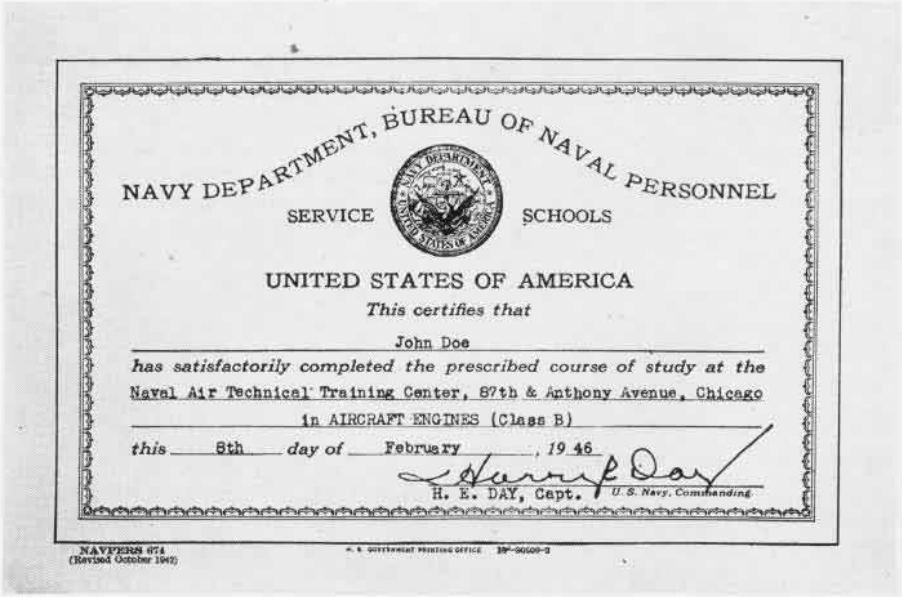
CAA Recognizes Aircraft Engines Diploma as Exam Requirement

Men with diplomas certifying completion of the Aircraft Engines course given by the Naval Air Technical Center, 87th and Anthony Ave., Chicago, now are eligible to take the prescribed CAA examination for a mechanic certificate with engine rating.

Announcement of this policy was made by the Chief of the General Inspection Division, Civil Aeronautics Administration. CAA field representatives will accept the NATECHTRACEN aircraft engines certificate as satisfactory evidence of experience required to take the examination given by CAA.

Men who have completed the course are considered by the CAA to have met the experience requirements of Section 24, 211 of part 24 of the Civil Air Regulations, that outlines qualifications for civil examinations in aircraft engines.

Later it is hoped that like recognition will be given to men holding certificates from the Naval Training School (Aviation Machinist's Mates) when that school is established at Naval Air Technical Training Center, Memphis.



NAVY DEPARTMENT, BUREAU OF NAVAL PERSONNEL

NAVY DEPARTMENT SERVICE SCHOOLS

UNITED STATES OF AMERICA

This certifies that

John Doe

has satisfactorily completed the prescribed course of study at the

Naval Air Technical Training Center, 87th & Anthony Avenue, Chicago

in AIRCRAFT ENGINES (Class B)

this 8th *day of* February, 1946

H. E. DAY, Capt. U.S. Navy, Commanding

NAVPERS 674 (Revised October 1942)

U. S. GOVERNMENT PRINTING OFFICE 16-90509-2

NAVY DIPLOMA QUALIFIES MEN TO TRY FOR A MECH CERTIFICATE WITH ENGINE RATING

New Curtiss Fighter Was Tested

Plane Featured Counter Rotating Prop

Originally designed in 1940 around the Lycoming inline engine, the XF14C was the Navy's first application of the dual counter-rotating propeller. Early in the progress of the design it became apparent that the engine would not be ready, so an alternate version was laid out with the R-3350 engine, that designed to incorporate an improved type of turbo supercharger.

Progress on the XL14C lagged behind due to other pressing problems and to lack of progress in the engine, propeller and supercharger development of the three versions under consideration by the Navy only the XF14C-2 was built and delivered. This plane has been used for power plant installation testing and at present is at NAMC Philadelphia.

Approximate specification figures released on the experimental plane include: weight, 13,400 lbs.; VMAX at sea level, 313 mph; VMAX/Alt 425/34,000; rate of climb at sea level, 2700 feet per minute; rate of climb at critical altitude, 2060 ft. per minute at 32,000.

ARMAMENT INCLUDES FOUR 20 MM CANNON

Training Schools Form League

Athletic Teams to Vie for Trophies

Formation of an athletic league this spring among stations under air training has been perfected for improving morale, better officer-enlisted man relations, and to further physical training.

Membership in the Naval Air Training Athletic Conference is set initially as NATB Corpus Christi and Pensacola, NPFS Ottumwa, NAS Jacksonville, NAS Miami, NAS Hutchinson, NAS Fort Lauderdale, NAS Banana River, NATTC Jacksonville, Memphis and Ward Island. Major sports will be football, baseball, and basketball. Boxing, wrestling tennis and golf will be minor sports, conducted on a tournament basis.

Suitable cups for championship teams will be provided. Five conference games must be played by each team in the football league, whose members will be Banana River, Corpus, Hutchinson, Jacksonville, Memphis, Miami, Ottumwa and Pensacola. Other stations listed above—Ward Island, Jax NATTC and Fort Lauderdale—will play baseball and basketball, in which 12 games will be required to win the title.

WRESTLING TEAMS WILL VIE IN TOURNEYS

Two swimming meets and boxing and wrestling tournaments will be held yearly. The conference is expected to get underway with the coming of baseball season this spring. Games with non-conference teams also will be encouraged.

To carry on the program, officers, especially naval pilots, will be needed to fill coaching jobs with the teams. Plans for the conference were laid at a meeting of Physical and Military Training officers held at Pensacola recently.

Gunfire Spotters to Get Wings

Marines Only Ones Eligible at Present

The Secretary of the Navy has approved establishment of the designation Naval Aviation Observers (Tactical) for officers of the Navy and Marine Corps who perform duties as gunfire spotters, artillery spotters and general liaison and observing duties in connection with amphibious operations.

BuPers announced it does not contemplate designating any naval personnel to that classification at present. Marines will be the only ones so designated. Such observers will wear gold embroidered or bronze gold-plated metal pins with wings. The center will have a silver center device with gold anchors and two crossed guns in gold.

CROSSED GUNS HONOR AERIAL OBSERVERS

Cadets Fly Link Combat Patrols

Men Build Up Confidence On Trainers

NAAS Barin Field—Five Link trainers turning in unison on orders from a flight leader can be observed almost anytime in the Link building at this field, home of VN4D8.

Cadets are familiar with Link trainers and with radio range before they reach Barin Field. There they are given two individual flights to determine their abilities to navigate while flying a Link and then are assigned to Links in flights of five with a leader in charge to carry out air combat patrol or search.

Here's how it works in a typical flight class: Cadets enter the briefing room where they find pre-flight information on a replica of a carrier briefing board. The terminology and communication procedure is that used in CV navigation. After the search or patrol is worked out, cadets receive the order "Man your trainers."

Link trainers, set up in groups of five, have radio communication with each other and with base. The base has a navigation instructor as fighter director. An intercommunication system also exists between the cadet in each Link and its operator. This double communication system teaches the cadet to become switch conscious.

Orders involving new headings, wind changes or information concerning a sighted enemy are sent out by the fighter director at base. Often one member of the flight will sight up the enemy during his search. When an enemy is sighted it becomes the responsibility of the flight leader to pick a rendezvous position from which the strike on the enemy may be made, to give the vector heading for the strike and to return his flight to the carrier.

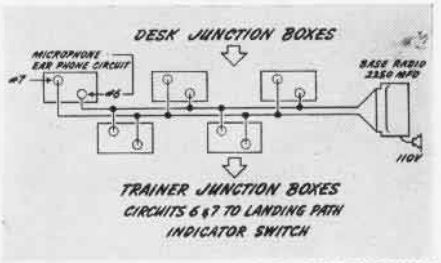
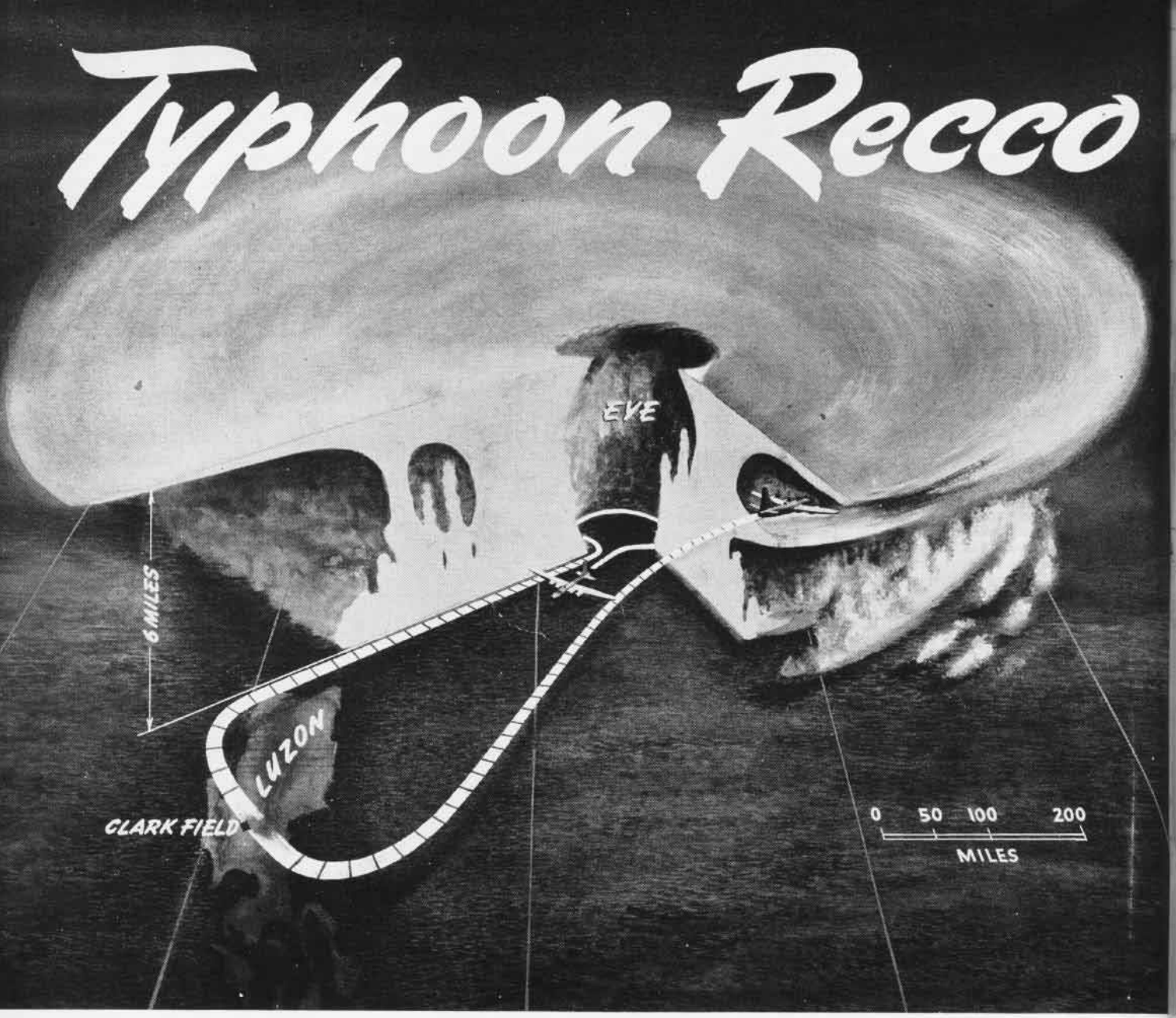


DIAGRAM SHOWS LINK SQUADRON HOOKUP

Other members of the flight can't afford to relax and track the flight leader from place to place. The fighter director may at any time change flight leaders. Since the fighter director has radio communication with the flight at all times, cadets are judged on the coordination of the flight as a whole and on their ability to check their squadron leader at all times. All members of the flight share the leader's responsibility in bringing the squadron safely home.

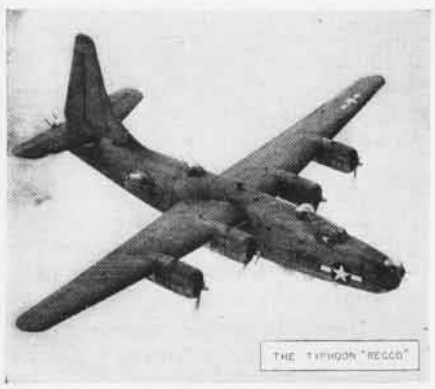
Mark III board work and path of the crab are checked upon completion of the flight. The search is discussed with each cadet, errors are pointed out and suggestions made. Instructors regard the Link trainer air combat patrol as a laboratory period of practical navigation that enables cadets to make important decisions, correct mistakes, practice radio procedure, carry out changes and bring their squadron home.

Typhoon Recco



TWO NAVAL AIRCRAFT FROM CLARK FIELD, LUZON, LOCATE THE CENTER OF A TYPHOON AND DETERMINE ITS SIZE AND INTENSITY

Multi-Engined Navy Planes Fly Into Typhoon Areas, Plot Data As to Their Extent, Severity



PB4Y-2 FAVORITE OF NAVY RECCO PILOTS

"IN A TROPICAL cyclone, frame buildings can be crushed like peanut shells; carriers and cruisers on the chaotic seas of the storm area, their decks lashed by gusts that may reach 200 knots, toss like chips of wood; tidal floods, driven by the strongest winds of the tropics, wash ships ashore and inundate coastal bases; aircraft, whether grounded or in the air, may be carried like straws in a whirlwind or canoes in the maelstrom."

These words are taken straight from the Navy's textbook *Aerology for Pilots*. Giving advice, that book says, "Avoid the entire storm, if at all possible."

Typhoons, as well as hurricanes, are tropical cyclones and are exactly the same violent weather phenomenon. Two different names occur because of differences in geographical location. Both named mean—DANGER, PILOT STAY WELL CLEAR. NO FOOLING.

Astonishingly, there are Navy pilots of Pacific patrol squadrons who can be proud that they did not stay well clear, but that they successfully flew into the black clouds of typhoons, sometimes to the center of the storms. Remarkable data recently made available by aerology shows at least 347 flights were deliberately made into typhoon areas by Navy pilots and trained aerologists.

In 1944 and subsequently, the Army and Navy have cooperated in hurricane observations in the Gulf of Mexico and in the Caribbean. These flights were usually in the outer edges of the storms with no attempts to approach the center deliberately for additional information. The value of the data obtained is shown by a statement of the Chief of the U. S. Weather Bureau. He said that aircraft reconnaissance virtually reduced loss of human life by hurricanes to zero.

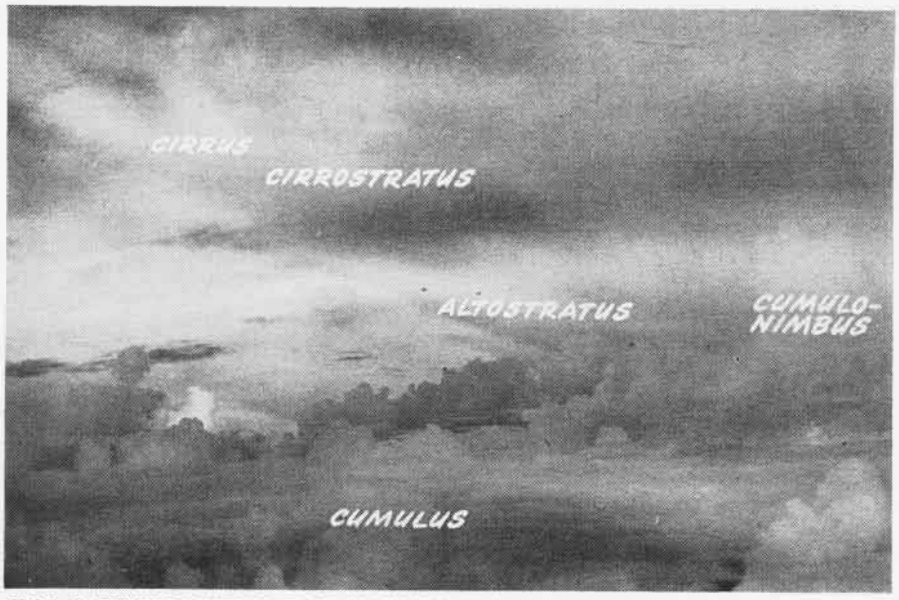
Typhoons were probably the greatest problem faced by naval strategists planning the defeat of Japan. The route to Tokyo curved through the Carolines and Marianas, to the Philippines, and through Okinawa to Japan itself. Unfortunately, this was exactly the path most frequently traversed by typhoons.

Major damages to task forces of our Pacific Fleet in December, 1944 and in June, 1945, proved that the network of weather stations on the widely scattered islands was not adequate for forecasting in typhoon situations. So vast was the Western Pacific that dangerous storms could form and move for hundreds of miles before meteorological instruments could provide significant data for the beginning of computations by the aerologist. It was sometimes reports from a ship already in danger which first informed the analyst that another of these whirling meteorological monsters had been born. Once detected, both ships and ordinary aircraft would then avoid the suspected danger area and the aerologist would be without the data vital to his analyses.

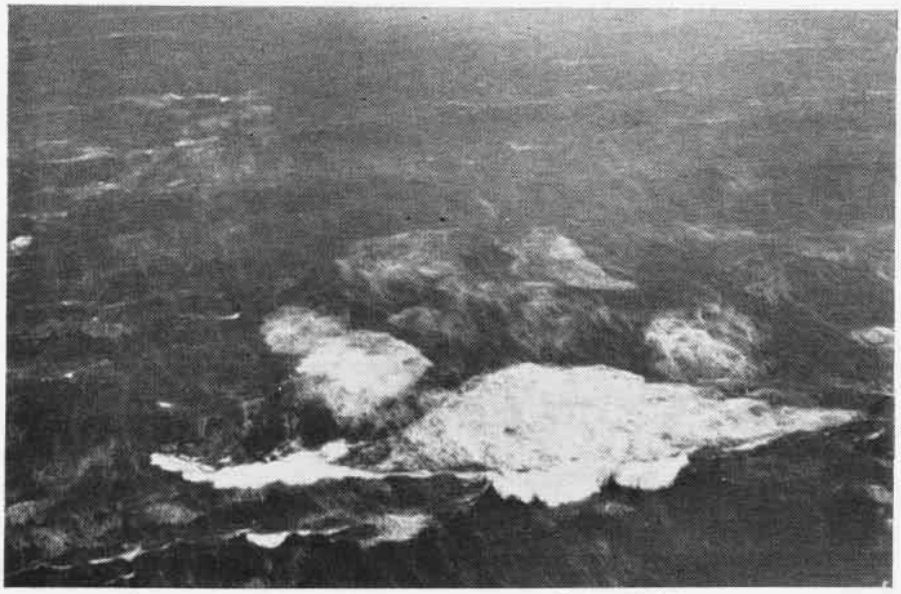
To aerological officers familiar with successes of hurricane reconnaissance it was evident that similar searches should be established in the Pacific. By the latter part of June, through their efforts, three aircraft had been designated as reccos at seven bases.

DAILY searches of the most likely typhoon generating area by aircraft carrying aerological personnel were also begun. Whenever a routine search reported an extensive area of rain and increasing winds, such as might be indicative of an incipient typhoon, the "special reccos" were sent out. The tasks of the special, or typhoon reccos were to locate the center of the storm, determine its size and intensity, and its movement if possible—and to radio that information quickly to the anxious forecasters at the weather centrals.

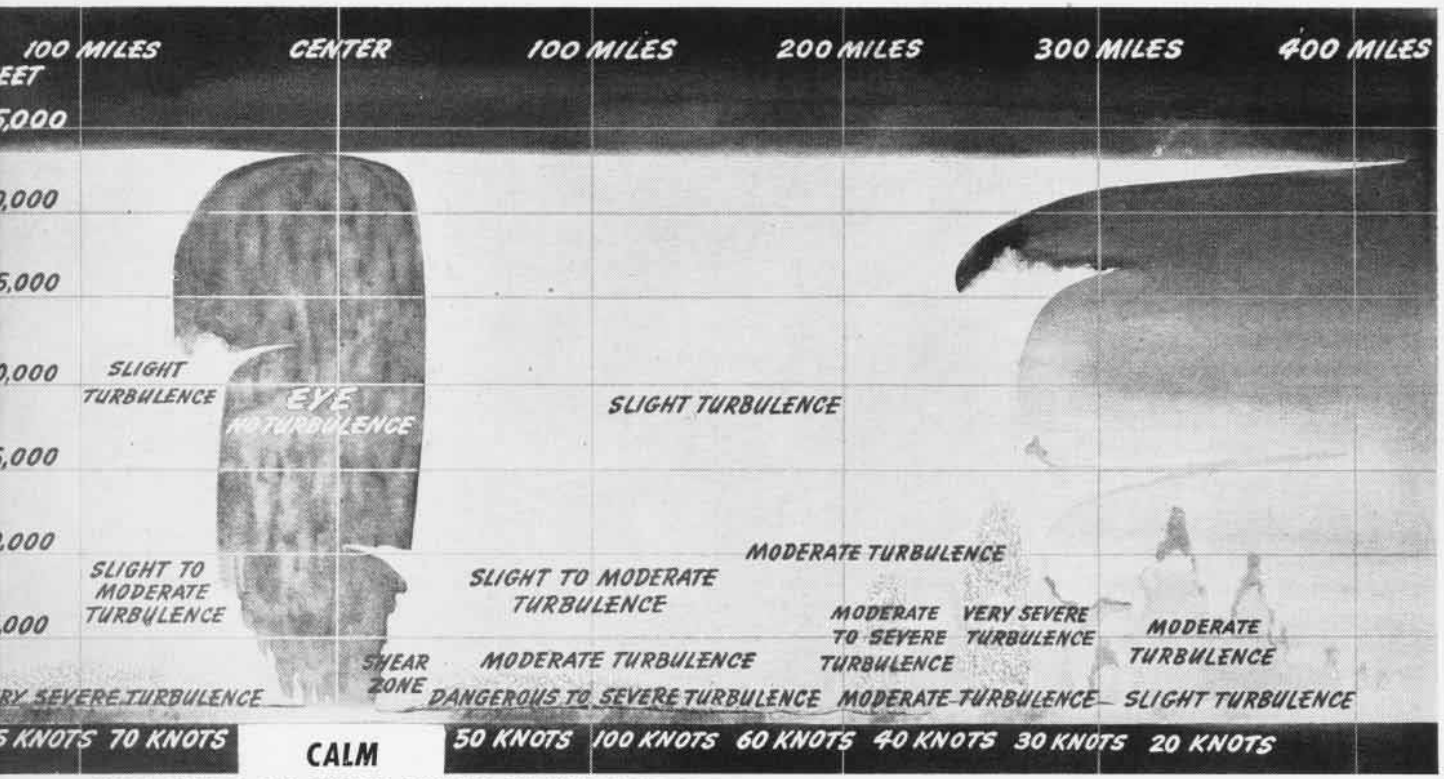
Just how successfully the typhoon recco performed its mission is shown in a report by the Commander Third Amphibious Force in connection with the occupation of Honshu. The ships of that force were affected by nine typhoons during the final operations against Japan, but by means of carefully executed delays and diversions only one pontoon causeway was lost. One typhoon situation involved more than 350 ships and required 23 separate orders for the changing of course. That report concluded dramatically:—"Slow and weather vulnerable convoys can be moved through the typhoon belt, provided sufficient weather information is available. The most valuable weather information has been obtained by special weather reconnaissance aircraft."



EDGE OF TYPHOON VIEWED FROM 10,000' SHOWS CHARACTERISTICS


TREMENDOUS SWELLS 50 FEET HIGH PHOTOGRAPHED FROM 700 FT.


100-KNOT WINDS MAKE SEA WHITE WITH AIR-BORNE STREAMERS



CROSS SECTION OF A TYPICAL TYPHOON SHOWING ZONES OF TURBULENCE: NOTE THE SHEAR ZONE BETWEEN EYE AND BODY OF STORM

Pilots Seek Out Storm's Center To Find Aerological Data Which Can be Used by Ships, Aircraft

THE SUPREME urgency of protecting shipping and shore-based installations from typhoon damages reduced typhoon reconnaissance from a scientific study to a job of tracking the storms, yet many discoveries were made which will be greatly beneficial to both military and commercial aviation in the tropics.

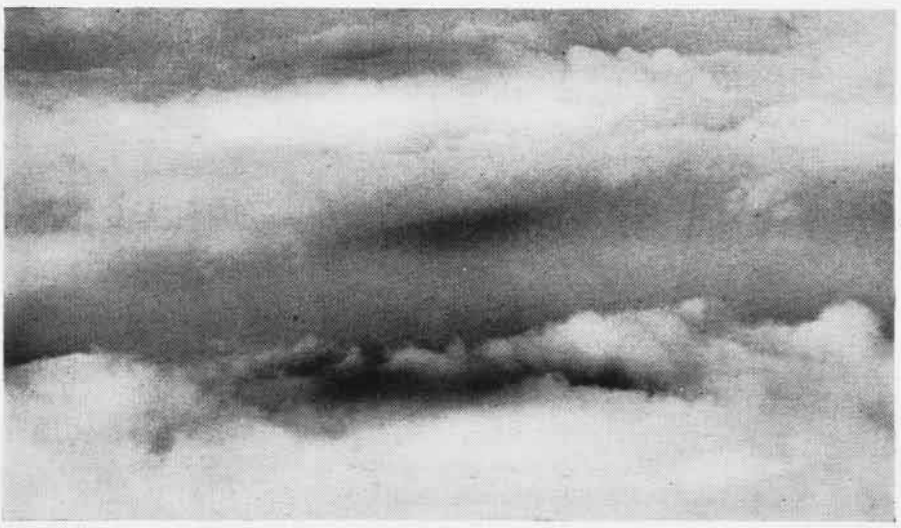
Pilots flying typhoon searches were never obligated to fly into weather considered too dangerous or to exceed the plane's safe operational range. Location of a storm center was accomplished by flying into the heavy rain and increasing winds toward the estimated position of the center until turbulence began to become excessive, then circling counterclockwise with the wind, at a constant surface pressure as determined by the radio altimeter. Sometimes it was practicable to fly sufficiently close to the center to penetrate the calm zone or "eye" to be found within every active typhoon or hurricane. This eye is of a nearly circular pattern and is most frequently 20 to 30 miles in diameter. Its calm is quite deceptive.

In some respects the eye might be much like the hole of a doughnut for it is an area of few or no clouds down through the thick cumulonimbus-like clouds of the typhoon. A pilot entering an eye of a tropical cyclone for the first time is pleasantly surprised, for from as bad flying weather as he ever experienced he immediately breaks out into an area that is frequently CAVU. In the eye the wind is light or calm and the sun sometimes shines brightly on a few fluffy cumulus and a nearly quiet sea. In a fast moving storm, the sea will be rough and confused and the eye have a thick cirrostratus lid.

More than 20 planes from Clark Field have entered and examined the eyes of typhoons.

Although rain has lowered engine temperatures below safe operating limits and caused electrical troubles, and visibilities near zero occur; turbulence, or rough air, presents the greatest danger to typhoon or hurricane flight. Safe flight procedures demanded that turbulence zones in tropical cyclones be charted. The vertical cross-section showing turbulence that is included in this article is based on nearly 100 flights made from the Philippines.

It has been discovered that rough air occurs from three different reasons: *1.* Because of convection, or the boiling action of the air, as occurs in thunderstorms or towering cumulus clouds. 2. Because of eddies produced in the air that moves rapidly over waves that may be 40 to 50 feet high. 3. Because of the shear that exists between the strong storm winds and the calm eye.



OBLIQUE VIEW LOOKING DOWNWARD INTO THE EYE—THE EXACT CENTER OF TYPHOON

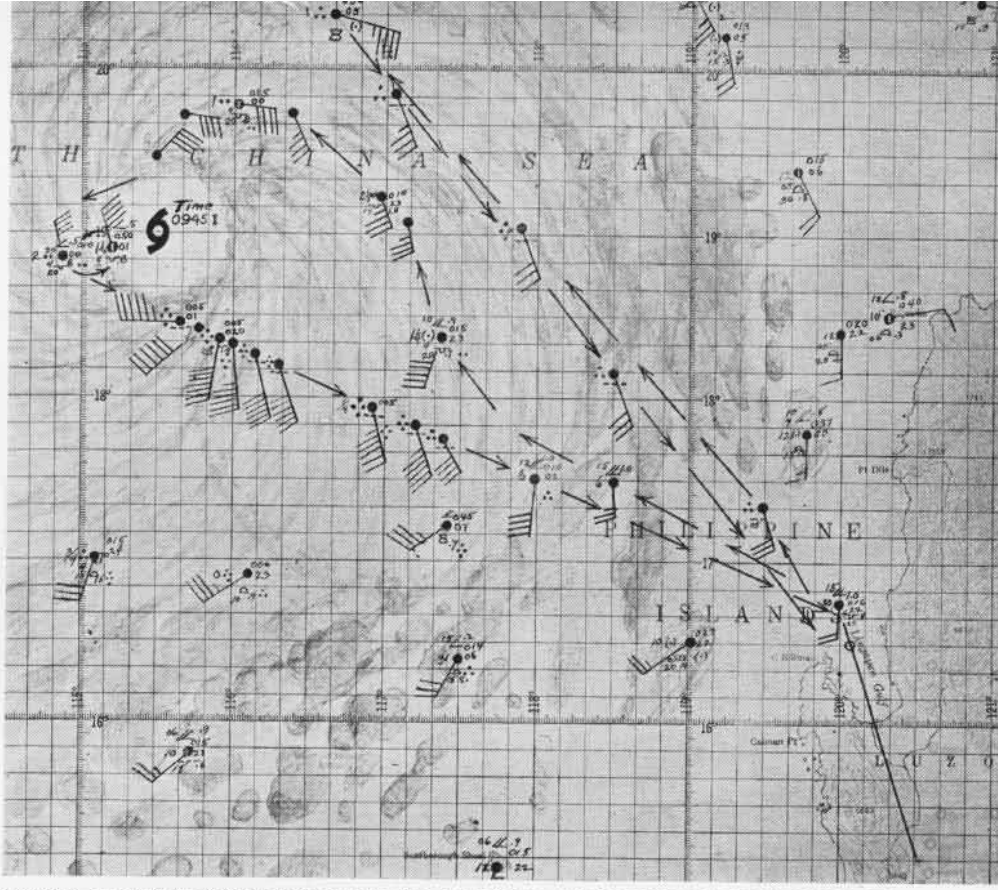
Convective turbulence occurs within the cumulonimbus which make up the outer walls of the typhoon but rapidly becomes less as winds increase in velocity. This type of turbulence is most likely to lift or drop the aircraft. It can be avoided by flying under the storm.

Eddy turbulence which causes the aircraft to abruptly roll, yaw and pitch, becomes severe at low levels when winds exceed 60 knots. Experienced pilots and aerological observers can lessen its effects by climbing.

Turbulence caused by the wind shear at the eye will likely cause a sudden sidewise motion but is not likely to be dangerous.

Just what a typhoon flight is like is shown by the tracks of flights from Clark Field on 7 August 1945. During the first few days in August that storm was tracked as a weak counterclockwise circulation between Guam and the Philippines and on the night of the 6th crossed Luzon. In the morning of the 6th a recco penetrated its eye, just off the west coast of Luzon but winds were not over 50 knots. On the 7th centered over the center of the South China Sea, the storm was severe.

The first typhoon recco had no difficulty reaching the eye and climbed to about 5,000 feet and made the panorama which appears at the bottom of this page. This photograph shows the blue sky over the center of the storm and the cumulonimbus which made up the body of the storm. The recco then descended beneath the storm to return home. Here winds up to 100 knots were observed and the photographs made of sea surface that are included here. Flight was at 400 to 700 feet altitude and turbulence was severe. Control cables were permanently stretched and one elevator tab ceased to work.



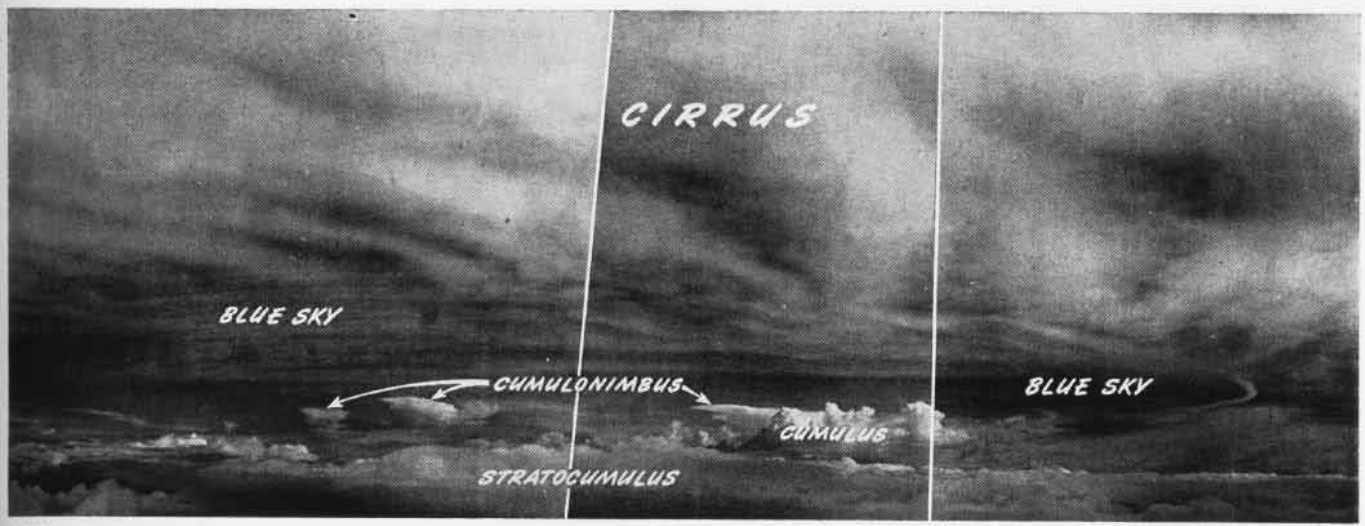
TRACKS OF TWO AIRCRAFT INVESTIGATING A SEVERE TYPHOON IN THE SOUTH CHINA SEA

The two reccos established radio contact in Lingayen Gulf and the second was warned not to enter the storm. The second recco therefore did not venture into or around the storm. Neither the first recco nor its pilot was able to fly for a week after this.

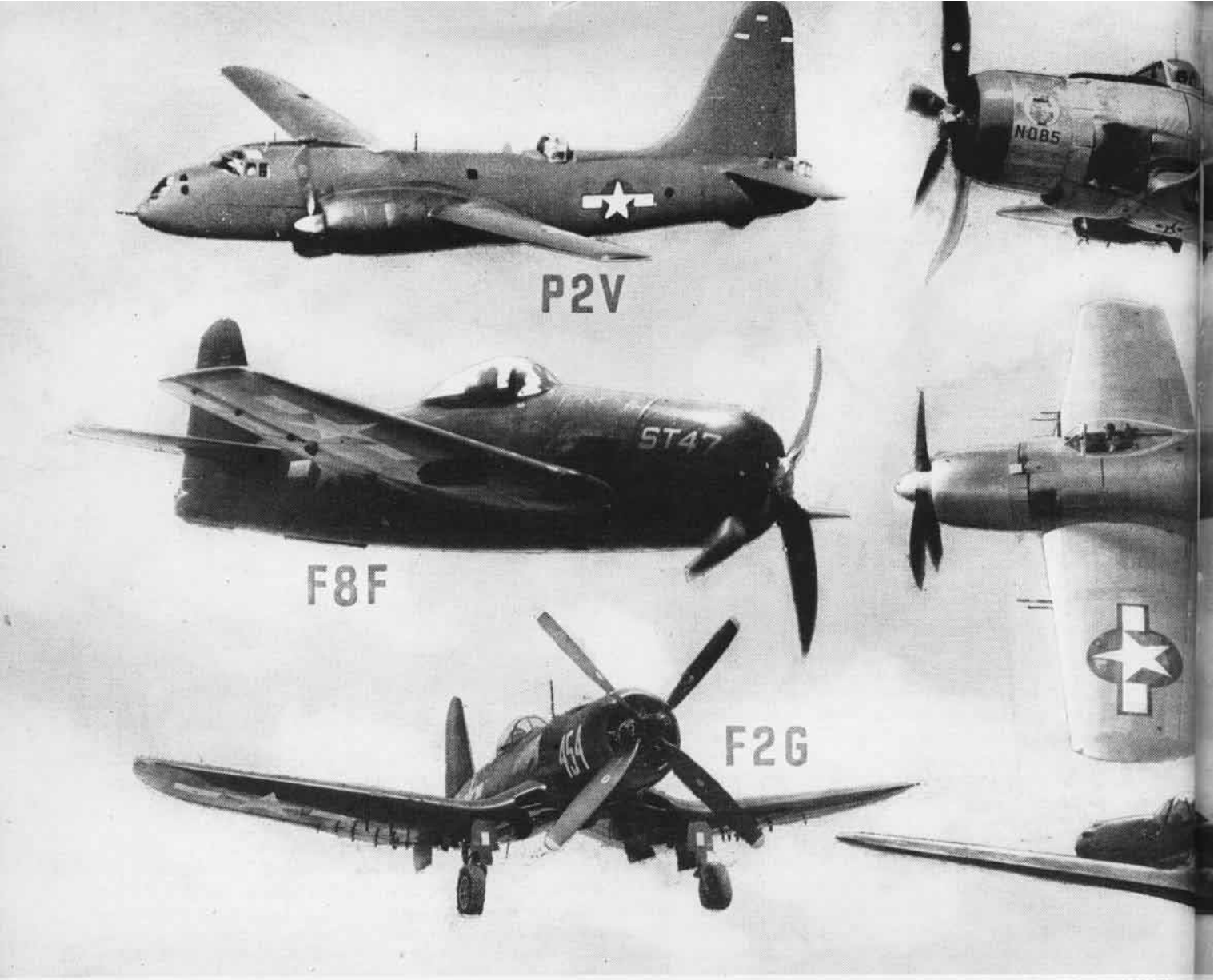
Only one aircraft with its crew is known to have been lost on a typhoon reconnaissance flight. That plane disappeared within a typhoon somewhere south of Formosa. The cause of its disappearance is unknown.

Inexperience and the urgencies of war cost special weather aircraft many narrow escapes and created too many interesting experiences to be recounted in such a short article as this. In one instance a recco with a 145 mph airspeed found that he had made good 15 miles in 30 minutes. He had a 115-knot headwind to fight to reach his home base. After battling a typhoon nearly all day another because lost near nightfall in a solid mass of thunderstorm between Luzon and Formosa. Another sank one small Jap vessel and damaged another upon becoming bored with just a typhoon.

Two weather reconnaissance squadrons, to be known as VPW squadrons, are being organized for western Pacific. Regular Navy search planes will continue to protect Gulf & Caribbean bases.



PANORAMA TAKEN WITHIN EYE OF TYPHOON SHOWN IN CHART ABOVE: AIRCRAFT WAS FLYING AT 5,000 FT. OVER CENTER OF STORM



GREATER SPEED, FIREPOWER AND CLIMB FEATURE NEW TYPES OF PLANES, SOME EXPERIMENTAL, THAT NAVY HAS REVEALED

JRM-1, POWERED BY 2400-HP ENGINES, CAN BETTER 200 MPH

FAMILIAR MARTIN MARINER HAS AN AMPHIBIOUS VERSION, PBM-5A

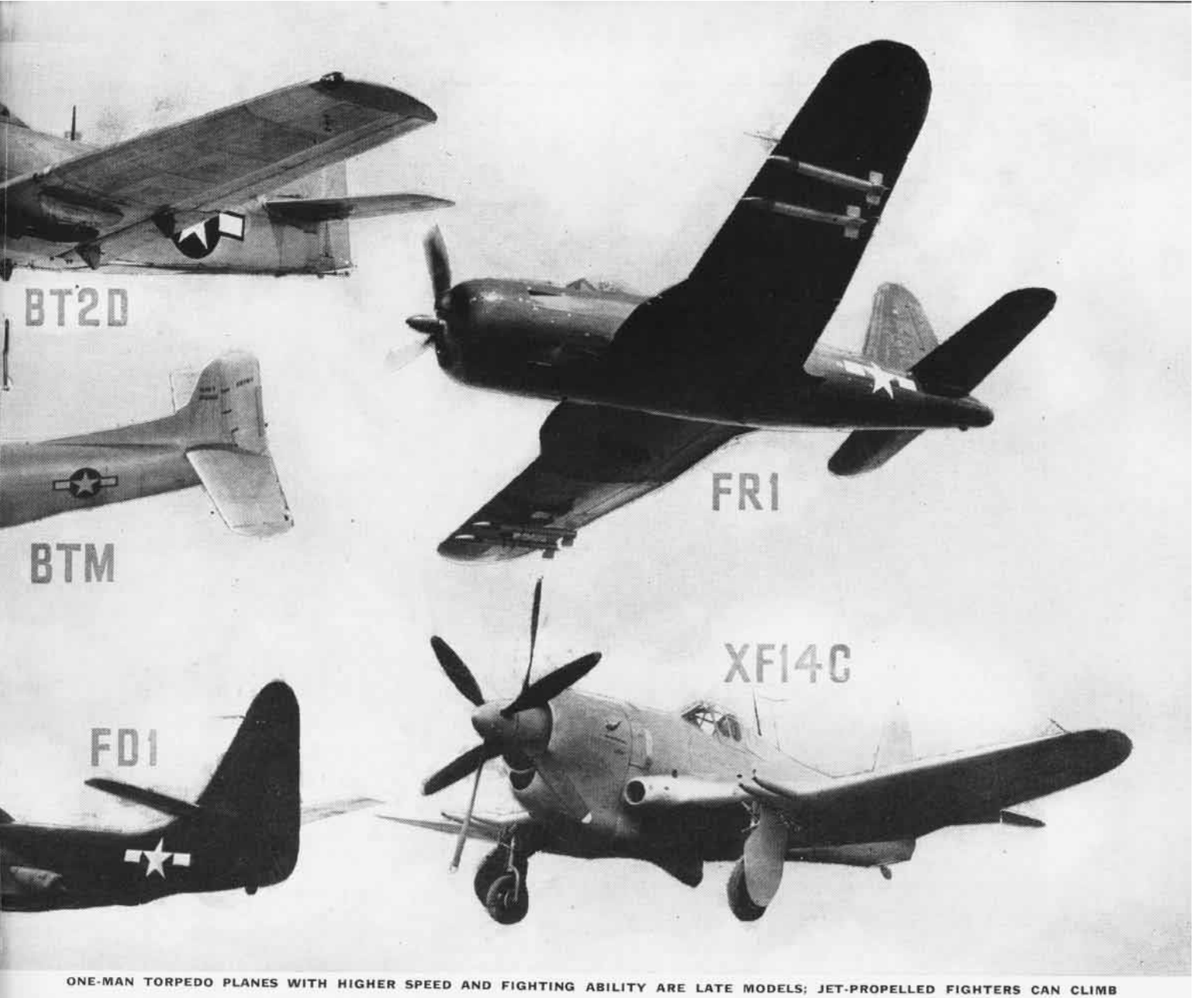
NEW NAVY PLANES

Many Types of Fighters and Bomber Aircraft Were in Works in the War's Closing Weeks

THE MANY new "faces" shown on this page are some of the plane types the Navy was experimenting with or brought out during closing days of the war. Since VJ day, the wraps have been taken off many which may look new.

Some will not be used operationally since present-day trend is on newer and faster aircraft. Others are modifications of war-tried planes, like the F2G-1, a *Corsair* with a 3,000 hp engine in the 450 mph class, and the PBM-5A, the old faithful *Mariner* with wheels. The Navy also is interested in jets. The FR-1 *Fireball* has a conventional prop and jet unit in the tail. The 500-mph. FD-1 has twin jets near the roots of its gull wings and weighs under 10,000 lbs.

One of the most highly-regarded of the new fighters is the F8F *Bearcat*. It weighs 9600 lbs. and climbs about a



ONE-MAN TORPEDO PLANES WITH HIGHER SPEED AND FIGHTING ABILITY ARE LATE MODELS; JET-PROPELLED FIGHTERS CAN CLIMB

mile a minute, as does the FD-1. The Navy is modifying FG-1D *Corsairs* with turbo-superchargers for extreme high altitude study. These planes will be known as FG-3's. The XF8B, the Boeing fighter with counter-rotating props, tops 400 mph and climbs with the F6F-5 despite its 17,500 lbs. Another experimental fighter was the XF14C which also had three-bladed counter-rotating props. It carried four 20 mm guns.

Two single-seat, BT-type planes have been revealed since the war's end, the BT2D and BTM. The Martin *Mauler*, BTM, is a dive-torpedo-bomber with 3,000 hp P&W engine putting it in the 350 mph class and a range of 1700 miles. The BT2D also combines diving ability with long range and ability to pack 6,000 pounds. The tough P2V tops 300 mph with a 3500-mile range carries two torpedoes and six 20 mm's.

A successor to the famous Martin *Mars* was brought out with a single tail and other revisions. The JRM-1 has a 200-foot wingspan, four 2400-hp engines and a 207 mph maximum at sea level. The big plane weighs 75,000 lbs. empty.

In the seaplane class, the Navy has the XOSE-1, made by Edo. Its Ranger 550-hp engine gives it 190 mph top speed. It weighs 2500 lbs. less than the speedier SC-1 *Seahawk*.

BOEING'S HEAVY FIGHTER HAS COUNTER-ROTATING PROPELLERS

XOSE-1, LIGHT SCOUT PLANE FOR BATTLESHIPS AND CRUISERS

AFLOAT AND ASHORE

NAS Ft. Lauderdale—Eleven torpedo bomber flight instructors and assistant instructors who volunteered to help search for 27 pilots and aircrewmen lost on a routine navigation flight established an enviable safety record. Despite their lack of recent experience with carrier landings, they flew off the *Solomons*, making 55 landings and takeoffs without even a blown tire. Navigation performed on the searches covered 30,000 square miles and went out 600 miles to sea. All of the pilots were combat experienced, having averaged about 100 landings and takeoffs with the Fleet but only half had been on a CVE and many months had passed since they had made a carrier landing.

MCAS Cherry Point—Engineers from BuAer and BuDocks have been making a minute survey of the station's landing strips to find out how they have held up under the pounding of increasingly heavy aircraft used during the war. The survey is to determine the general suitability of heavy-traffic Navy air fields for service with the larger-type aircraft. The program will promote safer operating conditions and lower maintenance cost for runways suffering from overload.—*Windsock.*

MCAS El Toro—There are 160 separate buttons and levers to be pushed during flight of an F4U and few pilots or mechanics know what happens when they are pushed. That is why the F4U Maintenance School here has a cut-away model of the *Corsair* showing what happens. Glass replaces metal piping to show circulation of fluids and the paths of electrical currents. A stripped down engine operates at super-slow motion by a small electric motor.—*Flight Jacket.*

NAS Fort Lauderdale—Here's what one seaman-first had to say when the "Inquiring Reporter" asked his opinion of the new uniforms for Navy enlisted men:

"I'm not in favor of the Army-Navy merger and the new uniforms seem to be cut after the Army style, just one more step towards the merger. The sailor hat on the whites sets it off, but definitely. All a guy would need is an "ice cream sign" and he would fit in nicely at an ice cream vendor's convention without even being noticed. That is with the whites on. Give me my dungarees any day."—*Avenger*

MCAS Cherry Point—Cherry Point's Hostess House has opened its doors to Marine enlisted personnel. The newly-completed and fitted house can accommodate 35 guests. Individual rooms have facilities for two to three persons and are all equipped with private baths.

Rates are three dollars for a couple or two dollars for a single occupant per day. A Marine and his wife or a WR and her husband may stay together, but single guests are asked to share rooms due to limited facilities. Guests may stay a maximum of five days.

NAS Alameda—Six hobby-lobby shops have been opened on the station to accommodate the spare time of hobbyists. Cabinet makers can secure Brazilian mahogany, teakwood and plywoods at discounts for wood working. Machinists have the use of 11 lathes, three milling machines, two shapers and a grinder. Sheet metal work also is done at this shop. The lapidary shop is for ring and ornament makers and the archery workshop provides facilities for leather and wood working. A welding shop is available also for hobbyists.—*The Carrier*

NAS Jacksonville—Although many activities here are curtailed, the station utility squadron (VM) has, if anything, increased its operations. Its regular duties include furnishing crash, ambulance, weather, photographic, parachute drop and mail planes, plus air transport for persons on official business trips. It maintains and fuels transient aircraft. During football season it transported the station's team—a great morale builder. VM squadron also has a system of making flight time available to aviator separatees who need the time before they leave.

NAS Jacksonville—Almost all positions open to civilians are being filled by returning servicemen at this station, including some who worked here before going into the service. By the end of 1945, 563 vets had taken jobs on the station, including 162 who were on leave while in the armed forces.—*Air News.*

NAS Corpus Christi—Fire fighters at this station are given a two-weeks training course in latest technique under direction of E. D. Barr, chief fire inspector. Trainees use a 44-foot drill tower with interior stairways and windows to get practice under actual smoke conditions. They use life nets, belts, lines, smoke masks, ladders and other lifesaving equipment. Present complement of the NAS fire department is 70 men, with $70,000 worth of modern equipment.—*The Beam.*

NAS New York—What probably was a record for medals awarded at one time here was set when a VRS-1 pilot, Lt. Edward O. Jensen, was given two Distinguished Service Crosses and eight Air Medals. The awards were based on bombing patrols over the Philippines and reconnaisance flights over Okinawa, Formosa and the China Coast. Jensen already held a Navy Unit Commendation and Air Medal for aerial photography.—*Skyscrapers.*

VB-4—In preparation for going aboard the *Tarawa,* the squadron installed an informal system of getting a little carrier landing practice. At the end of each flight from its station, the squadron made field carrier passes. After making a carrier approach and receiving the cut, each pilot took off and reformed with the squadron for a normal landing.

U.S.S. Kula Gulf—Its services in the Navy's *Magic Carpet* operation terminated, this escort carrier went into drydock for repairs at Terminal Island Naval Shipyard on 29 January. The *Kula Gulf* is scheduled to report to the 16th Fleet for inactive duty.

Quantico—One out of every five men mustered out at Quantico since V-J Day has filed an application for disability claim with the Veterans Administration. According to a check made of Red Cross records by the *Quantico Sentry,* a total of 1331 people have filed disability applications.—*Quantico Sentry*

VPB-152—With the assignment of air/sea rescue duty on Marcus Island, one PV-1 was equipped with a Mk 7 life raft and Gibson Girl mounted on the racks in the aft bomb bay. This installation provided greater accuracy in dropping than could be had by the usual method of dropping emergency equipment from PV's. Turrets and guns have been removed to facilitate a greater fuel economy on mail and passenger flights to Marcus being made twice a week by two PV-1's.

NAS New Orleans—The Public Works sewing room has sewed on as many as 520 discharge emblems in one day. The Wave barracks have been converted to provide needed berthing for separatees and the time clock house remodeled to take care of heavier traffic.

NAS Quonset Point—The new station chapel dedicated recently will be known as the Dixie Kiefer memorial chapel, honoring the late commodore whose death in a plane crash last November 11 took one of Naval Aviation's outstanding heroes. The ex-skipper of the *Ticonderoga* spent some months here as ComFairQuonset.—*Quonset Scout.*

NAS Quonset Point—The research staff of Project Electra recently briefed a group of Army Air Force navigators in the difficult but fine art of polar celestial navigation. Latest charts, tables and instruments developed for use in high northern latitudes have been under celestial navigation trainer tests for some time by Project Electra. The army men "flew" the trainers, ending with a 16-hour fatigue check over the north magnetic pole.—*Quonset Scout.*

NAS Kahului—This Hawaiian air station is helping to solve the housing shortage of the area by converting a wartime barracks into peacetime homes for officers' wives and families. The building now has 16 four-room apartments, each with a living room, dinette, two bedrooms, kitchen and bath. Furniture was obtained from the Naval Supply Department.—*The Flyer.*

Pilots in the Standby and Ready Reserve will receive training in all late model aircraft, including newer operational types adopted.

Ground personnel will have opportunity for refresher training, and advancement while remaining eligible for longevity benefits.

Waves, serving in such jobs as pictured above, will aid in training of reservists if legislation now pending is approved.

WAVES JOIN RESERVES

Training Program Will Require Technicians on Active Duty To Train Aviators in Late Models

AIDING the pilots and ground crewmen they replaced during the war, the Women's Reserve, according to present plans, may carry on in peacetime as a part of the personnel required to operate Air Reserve stations. New legislation has been requested to establish the Women's Reserve on a permanent basis.

Waves assigned to Reserve aviation will serve as tower operators, aerographers, and in many other positions at the following stations—New Orleans, St. Louis, Minneapolis, Squantum, New York, Memphis, Willow Grove, Atlanta, Columbus, Dallas, Livermore, Los Alamitos, Grosse Ile, Olathe, and Glenview.

Until the beginning of the new fiscal year on 1 July, 1946, reserve aviators now on inactive duty may report to the Naval Air Reserve stations nearest their homes to obtain flight time. By July the Naval Air Reserve Training Program will be well under way, providing 100 hours flying time annually for pilots in the Ready Reserve and 50 hours per year for Standby Reserve aviators.

Late model Navy planes used the program's flight refresher training and syllabus flying will maintain pilots, aircrewmen, and ground personnel on a 30-day fleet readiness basis. Reserve air groups, squadrons, and units will be patterned after those of the regular Navy's postwar organization to keep reservists abreast of late developments.

THE RESERVE plan also includes non-pilot billets in all branches. Pilots and ground officers will attend 48 drill periods a year and a two weeks training cruise aboard a CV. Enlisted Marine or Navy men who have been on aviation duty should keep in touch with the nearest air stations as they can attend the drill periods, the training cruises, and will keep their rates, staying eligible for advancement and longevity.

Members of the Standby Reserve will not be required to attend any drill periods, but may qualify for the training cruise by doing so. They will not receive pay for the drills but will be paid during the two weeks training duty. Pay for a drill period amounts to one-thirtieth of monthly pay with additional flight pay for pilots and crewmen.

As planes becomes available, reserve aviators will be able to obtain more time. At present Glenview, Los Alamitos, New York, and Minneapolis report widespread interest and NAS LIVERMORE has contacted over 500 separated Naval Aviators.

Competition and efficiency within units and squadrons will be promoted through the awarding of two Naval Reserve Aviation trophies. One trophy, the Noel Davis Plaque, awarded annually to the most efficient division, is now at NAS LIVERMORE. The Conway trophy, a safety award, was last won by NAS GLENVIEW before the war.

MORE FLIGHT TIME

Reserve pilots are now allowed to fly six hours per month.

Get further information from any of the 15 stations mentioned in this article or any of the following regular stations which will also train reserve pilots—Anacostia, D.C.; Norfolk, Jacksonville, Miami, Seattle, San Diego, and Hutchinson.

CHINA PATROL

In August the war with Japan came to a sudden and spectacular end. It was then the mission of certain aircraft squadrons, among them VT 89, to cover landings and by a "show of force" to ensure that the enemy would be thoroughly discouraged from attempting any resistance. VT-89's personal account of its operations in the Yellow Sea during the early part of this ticklish period 1 Sept. to 13 Sept. is presented here as an interesting side light on this curious phase of the war.

On 1 September Task Force 72, consisting of the *Boxer*, *Antietam* and *Cabot* and their escort destroyers, departed Okinawa heading west toward Shanghai. VT-89 was aboard the *Antietam*, which though not actually battle proved, was in our humble estimation the best ship in the Fleet. Air operations commenced on 2 Sept. when two separate strike groups flew in over Shanghai.

On the early morning flight our 15 VT were the base unit. As we approached the land the ceiling commenced to lower. When we reached the city it was down to 500 ft. with scattered showers, all of which made the flight considerably more interesting, because we were able to fly quite low and really get a good look at the city. We saw two Jap flags flying. For the most part Chinese flags were in evidence indicating that the Chinese forces, either guerrilla or national, were pretty well in control. Five good airfields, three of which had considerable numbers of Japanese planes of various types were observed. We saw a few troops, some truck concentrations and a few AA batteries, but on the whole there appeared to be remarkably little enemy military in evidence. No one fired at us.

Altogether we spent an hour and a half over Shanghai. In the process we created something of a stir. Large numbers of people came out into the streets to watch, and by the time we left Chinese flags were flying from thousands of buildings. At one airfield, which we passed over several times, there was a group of Jap soldiers out in front of their planes, frantically waving white flags.

The next flight that came in managed to get in contact on guard channel (*radio*) with a downed transport pilot located at a field a little south of the city. The report of the incident indicated that he was more than a trifle inebriated. Apparently he talked on the radio for quite a while describing what was going on around him and telling Navy what a wonderful outfit it was. He kept inviting our people to land and help him enjoy his liquor and feminine companions. Apparently he had a limitless supply of both.

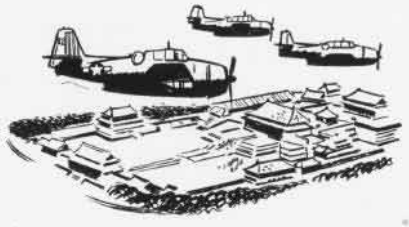
The next day strike groups covered the central and southern coastal areas of Korea. The VT went in over the central area, hitting the coast at the large seaport of Jinsen and proceeding inland to the capital, Keijo, then north and east over the two lesser cities of Kaijo and Kaishu and from there back to base.

On the fourth we flew over Dairen and Port Arthur. The Russians were already there and appeared to have the situation well in hand. They had certainly wasted little time. In 25 days, at the outside, they had come more than 600 miles.

The following day we went to Peiping, the ancient capital of China. We struck the coast at a place called Chinwangtao located just south of where the great wall of China begins. Chinwangtao, which is not a particularly interesting city from the air, was circled once, and then the flight proceeded west along the great wall toward Peiping at a fairly high speed. About a third of the way to Peiping a TBM from the *Boxer* developed engine trouble and made a forced landing. We learned later that its crew had a very interesting time making their way through China to Shanghai. They were equipped with necessary gear and money.

Peiping was everything we had expected and more. We circled the city twice and got a good look at many of its ancient wonders. A massive wall with large corner watch towers and huge gates protected by even larger towers runs all around the city. Our time schedule was a bit rushed so we departed heading southeast.

Eventually we came to Tientsin, population 1,500,000. It is much more modern

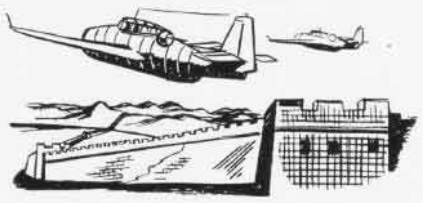


looking than Peiping and has no definite wall or square shape. Through its center runs the Hai Ho river. From Taku we flew out over the mirror-smooth Yellow Sea.

On the eighth American troops landed at Jinsen and moved inland the following day to Keijo, the Korean capital. Our task force covered the operation with air support flights. There appeared to be one usable pier and it barely reached to the water's edge. Launches could just manage to get up to it by sticking their bows in the mud. By the time we left approximately 200 soldiers had managed to struggle ashore. There was no resistance whatsoever. In fact a little knot of what appeared to be the local dignitaries was waiting at the dock with two black automobiles to receive the first landing party.

No Japanese troops were in evidence at Jinsen. A few more visible at Keijo, standing around outside their barracks. The flight that relieved us saw quite a large column of troops coming down a main road from the north into the capital. Presumably they were coming in, in accordance with the surrender terms. About all we saw of a military nature were six small submarines in two drydocks at Jinsen and a considerable number of Jap planes at Keijo and Kimpo airfields.

An amusing incident occurred at Keijo when one of the *Cabot's* F6F's landed to repair his cockpit canopy that had come off its track and stuck part way open. The pilot's flight leader instructed him to land and have it fixed. The field had some U. S. Army planes on it and was supposed to be



in our hands. We saw the *Hellcat* land and taxi toward the hangars. Shortly thereafter over the radio we heard: "Skipper, there is noth'en but Japs all around me" and about that time we saw the plane taxiing like mad out to the take-off spot. The skipper immediately called him and ordered him to go back and get the plane fixed pronto. After a small delay we heard in an extremely subdued tone of voice: "Skipper, do you really mean that?"

Following a sharp repetition of the order, we saw the plane turn around and taxi slowly back to the hangar. Presumably the Japs helped him fix his hood for we heard no more and he took off just before we departed the area and accompanied us back to the Task Force.

On the ninth some of the squadron saw the ceremony accompanying the lowering of the Japanese flag and the raising of our colors over the capital building in Keijo. The following day a strike group of about 120 planes with VT again as the base unit flew into Chefoo and Weihaiwei, on the other side of the Yellow Sea.

The day after that we made a flight over the one-time German base of Tsingtao located on the southeast coast of the Shantung peninsula near its base. To the northwest of the city were three good airfields.

An F4U from the *Boxer* provided the principal excitement on this flight. It developed engine trouble and made a forced landing in some rice paddies northwest of Tsingtao. The pilot was not scratched and, we afterwards learned, had an interesting series of adventures traveling through Chinese Communist territory before he finally got back to our own forces.

We were supposed to have sent another flight over Shanghai on the twelfth, but we entered the edge of a severe storm area and the weather would not permit. Our first Yellow Sea operation ended next day when we dropped hook at Okinawa.

Maintenance

CONSTANT MAINTENANCE IS NECESSARY TO KEEP GUNS IN READINESS: HERE AN AOM REARMS A HELLCAT ABOARD THE HORNET

Quonset Licks Tank Resealing

NAS QUONSET—This station has developed a satisfactory procedure for resealing integral fuel tanks on the R5O airplane that consists of coating interior of the tanks with three coats of Stoner-Mudge S-1711 sealant, using a fill and drain technique.

It appears that this new process will show a marked improvement over previous methods of sealing tanks because of greater resistance of Thiokol type sealant material to aromatic fuels.

The process consists of *1.* Removing previous tank sealing compounds, 2. Etching tank with chromic acid to prepare aluminum surfaces for application of the rubber sealant, and 3. Sealing of tanks, which includes a fill and drain operation, an air purging operation, and finally a curing operation.

A solvent solution of half ethylene-dichloride and half C-141 paint stripping compound was found most satisfactory for removing previous sealants. After soaking with this, the loosened material is removed with cold water under high pressure. Aluminum surfaces then are etched with a hot 3% solution of chromic acid. Tanks then are rinsed and dried as both acid and water are detrimental to sealant.

In coating the tanks, it is absolutely essential that viscosity of the sealant be controlled within a relatively narrow range to get thin uniform coatings free of pin holes, blisters or craters. It also is important that all excess material such as puddles and stalactites be removed after draining.

Since sealant contains 70% solids and 30% solvent, it is necessary to use an air purging treatment prior to curing to remove the major portion of solvents and minimize excessive shrinkage that

QUONSET'S TANK RESEALING PLAN WORKS

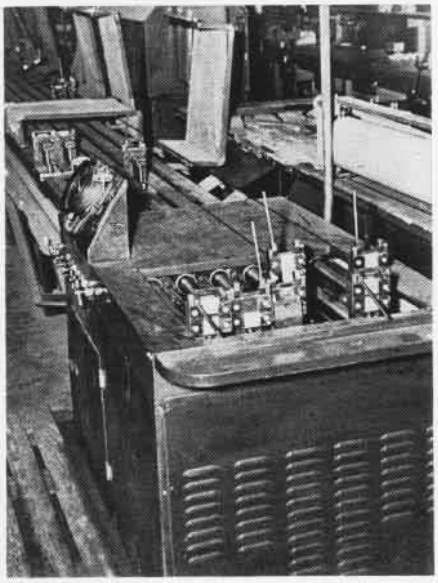
otherwise would occur. Purging is started with room-temperature air and completed with 120° F. air. After the solids content of the sealant has been increased to 90% or better, the sealant material is cured by introducing anhydrous ammonia into tanks and holding for a specific length of time. Curing or polymerization of rubber takes place, resulting in a solid coating of rubber which is practically impervious to fuels.

Before applying the third and final sealant coat an eight to 10 days aging period is allowed. Final installations, such as liquid-ometers and access doors are made with Minnesota Mining Compound, EC-801, which is cured merely by applying heat.

▸ ***BuAer Comment*—Heretofore attempts to reseal fuel tanks with various methods have met with only fair success. This tank resealing process, using Stone-Mudge sealant, has proven very satisfactory to date. A&R Department at NAS Quonset deserves recognition for their success in this final development.**

Test Swaged Fittings On Cables

NAS ALAMEDA—The A&R department has developed a unique cable tester for checking the swaged fittings



TESTER CAN HANDLE SIX CABLES AT ONCE

on aircraft cables. While testing six cables at once, this machine can be adjusted accurately to any stress desired from 300 to 4500 pounds. Raising or lowering lever (see cut) is all that is necessary to clamp or release a cable. One clamp for a cable can be secured to the channel frame for testing any length cable up to 50 feet. The other clamp is hydraulically actuated with a two foot travel.

After starting, the machine puts the desired stress on the cable for exactly three minutes. A no-flow valve accomplishes this by tripping a micro-switch and starting an electric timing device. The live head of the cable tester is returned to position pneumatically for a new test. Notice lower row of valves (at left of cut) for pneumatic cylinders which return live heads to retracted position. Movable screens over bed protect personnel from flying cable if a fitting fails.

▸ ***BuAer Comment*—Tester has twice the capacity of the present standard aviation stock unit, stock number BR18-T-566-8.**

Flap Angle a Problem on SB2C

VB-17—This command has been using the recommended 45° flap setting for SB2C-4E type aircraft in carrier landings and takeoffs. CASU-54 tried unsuccessfully to stop the landing flap at 45°.

The flap locking mechanism has failed in several instances while the plane was in a field carrier approach, allowing the flaps on one wing to retract while on the other wing they remained extended.

Full rudder and aileron were necessary to prevent the plane from falling over on its back. In each case a precarious few seconds were experienced before the necessary altitude and air speed could be attained to enable the pilot to pick up the extended section of the landing flaps.

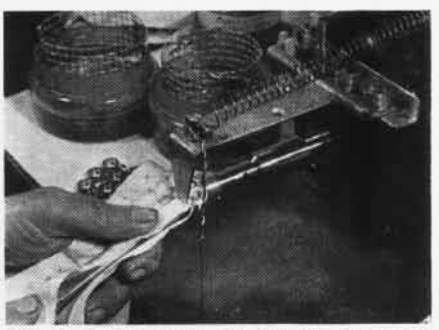
This command is interested in a method of stopping the flaps at 45° so that the flap locking mechanism will not have to be used.

▸ ***BuAer Comment*—Service Change No. 159 is being circulated in the bureau which puts a stop on the control quadrant so that the flap actuating lever cannot be lowered past the 45° position. This has been initiated by Design Coordination Branch and is believed to be much safer than trying to put locks on the flaps.**

Gyro Repair Idea Cuts Fatigue

NAS JACKSONVILLE—Devices to facilitate lapping of gyro ball races were developed by an employee of this activity under the Navy Employees' Suggestion Program.

The most valuable device is an arm operated by treadle action which applies leverage to the lapping tool, elim-



SIMPLE HINGE USED TO APPLY LEVERAGE

inating manual pressure which was very tiresome and caused soreness in the hand, arm, shoulder, and back of the operator. Another tool removes the gyro ball race without stopping the machine.

These devices have speeded up the process over 100%. At the same time, the number of rejections dropped 60%.

[DESIGNED BY FRANK W. DAVIDSON]

Daily Reports Spur A&R Output

Daily reports for A&R shops, instituted at NAS JACKSONVILLE on 1 January 1945, have proved an effective method of production control during the year. Each production shop has a report form which is filled out in rough by the shop supervisor at the close of working hours. This form is submitted to the production superintendent's office prior to 0800 on the following working day. In this office trained personnel consolidate the shop reports on their respective division report forms. These forms are then mimeographed and distributed to all officers and supervisors before the close of working hours.

The daily production reports give the following information: date of report, working day of the month, number of production units in back log, number of production units in process, number of production units completed on previous working day, number completed for the current month, number completed as of the same working day last month, and the number of personnel.

The production reports are studied by all officers and supervisors for unsatisfactory trends in production. Corrective measures are immediately taken by shifting personnel and procuring the necessary shop equipment and aircraft parts.

In addition to their production control function, the reports enable the A&R department to carry on an extensive incentive program. At the end of each month production reports are analyzed for production efficiency. Where a shop has shown an increase in output per person for three consecutive months, the shop supervisor receives a commendatory letter signed by the commanding officer, and the shop receives a production pennant which is displayed in the shop as long as it maintains its productive efficiency.

Marines Practice Deck Landing

MCVG-11—Torpedo Bombing Squadron 464 and Fighter Squadron 217 have participated in simulated carrier deck practice on dry land. A deck was laid out on the parking area near the group hangar.

It was equipped with a mockup island, a mockup arresting wire and a barrier made of bungee cord. All deck personnel were equipped with jerseys and helmets of proper color and were drilled extensively before actually handling the planes on simulated catapult and landings.

It is believed that this program will be of infinite value in eliminating to a great degree the uncertainty and unfamiliarity when the squadron goes aboard the carrier, thus reducing possibility of deck crashes from these causes.

MAINTAINING MARINE CORSAIRS WAS THE JOB OF QUANTICO A&R, NOW DECOMMISSIONED

QUANTICO A&R ENDS OPERATIONS

MCAS QUANTICO—Decommissioning of the A&R Department at Quantico brings to a close an activity that accomplished much in maintaining Marine aircraft during the war and which traced its ancestry back to a few wooden buildings and makeshift methods in World War I days.

Shortly after close of that war Marine aviation on the east coast was established at Brown Field, now the site of present A&R buildings. Facilities were housed in temporary wooden buildings and a wooden seaplane hangar. Repair and overhaul of aircraft consisted of taking planes one at a time as they could be spared by operating squadrons, disassembling them and rebuilding them completely.

Makeshift equipment and hand tools were used, supplemented by a poorly equipped machine shop. Parts were scarce and a great amount of local repair and manufacture was necessary. Test stands were wooden frameworks in a temporary wooden building exposed to the rigors of Quantico winters.

The present A&R was started just before outbreak of World War II and a production line method of reconditioning established. Due to size and physical location of the A&R buildings, it was necessary to institute certain methods and items of equipment not commonly found in other A&R departments. For instance, efficient handling of wing panels of the *Corsair* during reconditioning and prior to installation on planes became paramount. To overcome this obstacle, a wing dolly permitting mounting of the wing by the same hinge pin fittings as exist on the aircraft was built.

This dolly held the wing at any angle. It was mounted on casters and could be moved to any station on the production line. This equipment saved many man-hours. Another item which aided greatly was a jig to drill drag link pins of the landing gear. A process of lead alloy plating of the treads of the landing gear strut metering pin was another innovation that helped the landing gear overhaul shop keep abreast of production line requirements.

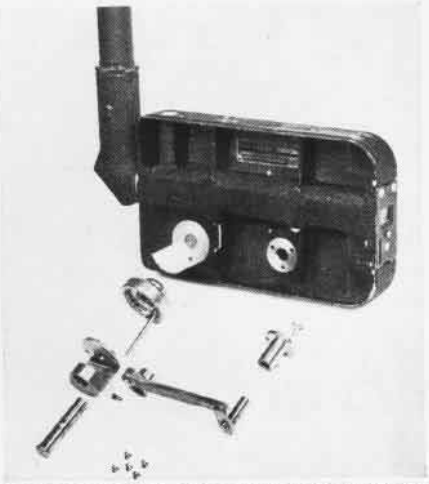
In overhaul of R-2800 engines and accessories, production was maintained by developing many processes and constructing of certain pieces of equipment. One of these was a test jig for the fuel feed valve which permitted operation of this valve under actual operating conditions on the test bench. Another was a conversion of a Stromberg flow bench which allowed mounting three carburetors instead of one. Acquisition of a piston ring inspection device eliminated installation of faulty piston rings which practically stopped test cell rejections because of high oil consumption when in the test cells.

PHOTOGRAPHY

Gun Camera Boresighting Modification

The Photographic Division, U. S. Naval Ordnance Test Station, Inyokern, California, has been making extensive use of forward firing AN-type gun cameras to obtain rocket sighting data. This application, particularly, of the gun camera created a boresighting problem since the cameras seldom stopped with shutter open.

To facilitate the boresighting operation, a modification of the standard gun camera



BORESIGHT TOOL SEES THROUGH SHUTTER

boresight tool was developed which permits the operator to depress a knurled knob and rotate the shutter while viewing through the boresighting tool, until the shutter is properly oriented. (See cut)

The design and construction of this device was developed by R. W. Edwards, PhoM 3/c.

Details on the construction of this modified boresighting tool will be published in a Technical Bulletin. Activities desiring immediate information on this modification may write directly to Chief of Naval Operations, Op-531A, Navy Department, Washington 25, D. C.

Should additional procurement of boresights be required in the future this modification will be incorporated.

Blue Spots on Ansco Film Negatives

Blue spots which appear on Ansco film negatives when stored under tropical conditions may usually be removed by bathing the negatives from 2 to 5 minutes in a regular fixing solution, washing in running water for at least 20 minutes and drying.

To prevent the formation of these blue spots, the negatives must be stored under conditions unfavorable to the growth of fungus. This can be done by keeping the negatives in either a sealed metal container with a quantity of silica gel or calcium chloride or in a heated cabinet in which the temperature is maintained at least 10 degrees F above that of the surrounding air, but never higher than 120°.

Preservation Check-Off Forms

Hedron FAW-8—Units which previously concentrated their activities on operational maintenance are now largely concerned with preservation and storage of aircraft. To insure completeness and accuracy in engine preservation techniques, this command has compiled detailed preservation and de-preservation check-off forms based on the various bulletins and technical orders issued on the subject.

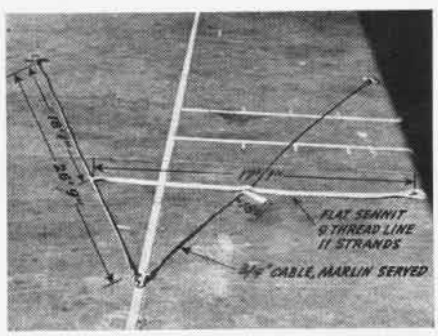
The check-off forms provide a progressive reference for the actual work and lessen the possibility of personnel overlooking any small detail which might impair the entire value of the process. The three mimeographed guides prepared by Hedron 8 cover: *1.* main engine preservation, *2.* main engine de-preservation, *3.* auxiliary power unit preservation.

▸ ***BuAer Comment*** **— The basic idea is sound and should be developed. To avoid omissions and variations from standard phraseology, check-off lists may be submitted to BuAer for comment.**

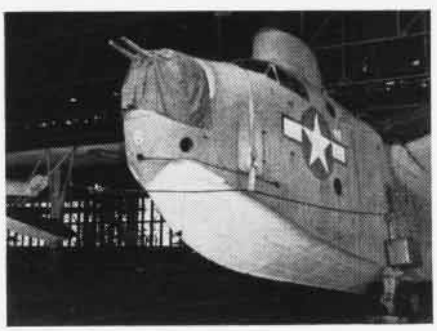
Towing Bridle For PBM Aircraft

FAW-3—A high speed towing bridle for bringing PBM aircraft forced down at sea back to the base has been designed by Hedron FAW-3. The bridle has proved very satisfactory during the past five months, with the USS *Barnegat*, AVP 10, successfully handling a considerable number of PBM towing jobs. The device, used for towing planes in the water only, is easily attached. Speeds up to 20 knots can be attained, and wing lines are not needed.

Two pieces of Marlin Served ¾ inch cable and a Flat Sennet (9 thread line, 11 strands) compose the essential parts of the device. The bridle hook, part of the beaching gear, can be ordered through regular supply channels by requesting the following parts: strut assembly, upper attachment — 162B48184; lock pin assembly—162B4897.



LAYOUT OF PBM HIGH SPEED TOWING GEAR



BRIDLE HOOK IS PART OF BEACHING GEAR

▸ ***BuAer Comment*****—An excellent idea.**

Operation of Heaters in PV-2's

VPB-130—To eliminate trouble experienced by this squadron in controlling cabin heat after heat exchangers were installed in PV-2's without hot wings, the following instructions have proved satisfactory.

Put heater control in cabin heat position. Heat will be indicated on gauge just above heater control handle. *Caution:* Do not let heat get above 200° or cabin will be filled with smoke. Heater control should be about 1/5 open, or far enough open for heat to remain at 180°.

If heat indicator shows heat and no heat is coming from the heater, do the following:

1. Serial numbers up to approximately 3700 — Just forward of main beam in radio compartment, in center of deck, pull up on dial and turn in clockwise direction to 90°. This should put damper valve on full heat position. (Amount of heated air can be controlled by this damper, but not temperature.) If fresh air is desired mixed with heated air, pull air temperature control out. This control is a push-pull unit mounted on radio compartment desk. This will cool the cabin as well as provide fresh air. There is an air temperature control for radar operator's position just aft and beneath "T" of heater duct and an individual damper control at heater.

2. Serial numbers from approximately 37400 up—All planes in this group have individual damper controls at Radar-Navigator, Radio-Pilot, and Co-pilot stations. This control is a wheel mounted on side of each heater and will regulate volume of air coming out of heater. The air temperature control (mixer valve) is mounted on radio compartment desk. By pulling the control out, fresh air will be mixed with heater air from exchanger, and consequently the air from the heater will be cooler. But heat will still register the same on the indicator in radio compartment. There is an air temperature control just aft and beneath "T" of heater duct for radar operator.

▸ ***BuAer Comment*****—This is probably the answer on how to control the greater heat rise generated by the new type exchanger. In service test at Patuxent River, report of 17 December 1945, the heat exchanger P/N 125977 and control of the heat developed got an unsatisfactory report.**

SUPPLY NEWS

FROM ASO AND SUPPLY DIVISION BUAER

Strikes Cut Steel Parts Supply

Some interruption in aeronautical parts production as a result of labor troubles may aggravate the critical and semi-critical nature of parts in the field. For example, PBM-5 exhaust stacks have already become extremely critical, and key supply points have been advised to issue them only on an AOG basis. Supply and maintenance personnel should exercise judgment in issuing steel parts.

Available M and M1 Item Lists

Paragraph 12 of ACL 128-44 directed the publication of lists showing the availability in the supply system of airframe items coded "M" and "M1" (items to be fabricated locally). Such lists have been issued for SB2C (including SBW and SBF), TBM, PBY, and R4D (all models). Lists are in preparation for PB4Y (all models), PBM, F6F, F7F, F4U, and FG.

Lists of "M" and "M1" items available in the supply system for the fighters and PB4Y's should be distributed within 60 days. The PBM list is now being printed and will be distributed shortly. None will be prepared for F8F, because "M" items were never procured, nor for FM, since the *Wildcat* will be out of service this year.

Two copies of each list are sent to each interested activity, one for the A&R department or maintenance groups and one for the Supply department. Additional copies may be obtained by writing the Aviation Supply Office, Attention: Airframe Division.

ACL 128-44 established the system of coding of spares for local manufacture by A&R activities and the procedures to be followed. ACL 82-45 further implemented this program. Study and frequent use of these two circular letters is strongly advised.

Spare Parts for 19XB-2B Engines

The FD-1 airplane recently announced to the public by the Navy will use two 19XB-2B turbo-jet engines, manufactured by Pratt & Whitney. Westinghouse Electric Co., of Essington, Pa., is responsible for engineering control of this engine. The 19XB-2B engine differs basically from the I-16 turbo-jet engine in that the former utilizes the axial (straight line) flow of gases while the latter has a reverse flow. The basic principles of the I-16 jet engine and the 19XB-2B are the same. The latter, however, has a multi-stage compressor.

ASO has placed on contract enough spare parts to support the overhaul program as outlined by BUAER. Complete accessories are being placed on contract and the spares required to overhaul 19XB-2B accessories also will be placed on contract when enough technical information is available. BUAER has established the policy for overhauling the 19XB-2B accessories by naval personnel, but some manufacturers have been slow in furnishing detail drawings and parts lists. Consequently there may be some delay in overhauling accessories, but it is expected that enough complete spare accessories will be available for maintenance and overhaul of the engine until accessory spare parts become available.

Initial production engine delivery is scheduled to begin in April, and the first overhaul is expected to take place at NAS LIVERMORE in the fall of 1946. Basic engine parts have been classified and assigned stock numbers. Accessories and accessory spare parts will be classified when the necessary technical information becomes available. An interchangeability and classification listing will be established and this information released to field activities as soon as practicable. Material inventories will be reported to ASO.

Flight Deck Shoe Replacements

Since flight deck shoes used aboard carriers are sufficiently rugged and strong to outlast a single sole or heel, a replacement quantity of 25,000 pairs of heels and 25,000 pairs of tap soles will be delivered to aeronautical supply points during May for service applications. The soles and heels will be in accordance with NavAer specifications M-702—soles, heels, taps; non-slip tread. The Avon Sole Company, Avon, Massachusetts, is supplying the heels and soles to the Navy under contract N288s-34787. Stock numbers are as follows: Soles (tap, Tri-Vac, non-slip tread)—R37-S-2445, size 7; R37-S-2445-10, size 9; R37-S-2445-20, size 11; R37-S-2445-30, size 13. Heels (whole, Tri-Vac, non-slip tread)—R37-H-671, size 6; R37-H-671-10, size 8; R37-H-671-20, size 10; R37-H-671-30, size 12; R37-H-671-40, size 14.

"We solo in four hops"

Flight Clothing Sales Authorized

By authority of the Secretary of the Navy, BUAER has developed a program for the sale of certain articles of personal property having a sentimental value, to officer and enlisted personnel. ACL 11-46 lists the following items of flight clothing which may be sold at prices as listed.

Gloves, Type A, R37-G-1580 to R37-G-1594, $2.73.
Gloves, Type C, R37-G-1600 to R37-G-1614, $2.35.
Glasses, Sun (green and amber lenses only), R37-G-970, $3.
Trousers, heavy shearling, R37-T-280 to R37-T-298, $50.
Jackets, heavy shearling, R37-J-132 to R37-J-138, $25.
Jackets, life, R37-J-150-75, $9.82.
Boots, winter, R37-B-4210 to R37-B-4216, $13.90.
Helmets, winter (old type), R37-H-760 to R37-H-768, $2.55.
Scarfs, R37-S-48, $0.67.
Frame Assy. Goggle, R37-F-225, $4.58.
Lens, amber, R37-L-216, $2.93.
Jackets, intermediate, R37-J-75 to R37-J-87, $16.
Jackets, summer, R37-J-125 to R37-J-131, $5.25.
Helmets, summer, R37-H-1320 to R37-H-1326, $2.48.
Caps, baseball, R37-C-618-12 to R37-C-618-24, $0.48.
Suits, summer (Byrd Cloth), R37-S-5360 to R37-S-5376-20, $10.
Suits, summer (Nylon), R37-S-5435-48 to R37-S-5437-48, $11.96.
Gloves, summer, R37-G-1460 to R37-G-1468, $1.95.

Airframe Provisioning in Process

The following plane types are undergoing provisioning action currently or will be provisioned soon: SNJ—coding of SNJ-4, -5, -6 airframe spare parts in February; FJ-1—airframe spares provisioning at Englewood, Calif. in February; F7F—final airframe provisioning at Bethpage, N. Y.; in process; P2V—airframe provisioning at Burbank, Calif. in February; R5C—airframe provisioning (tentative in February.

In the event that interim provisioning action, or other change in the schedule, becomes necessary, interested commands will be informed.

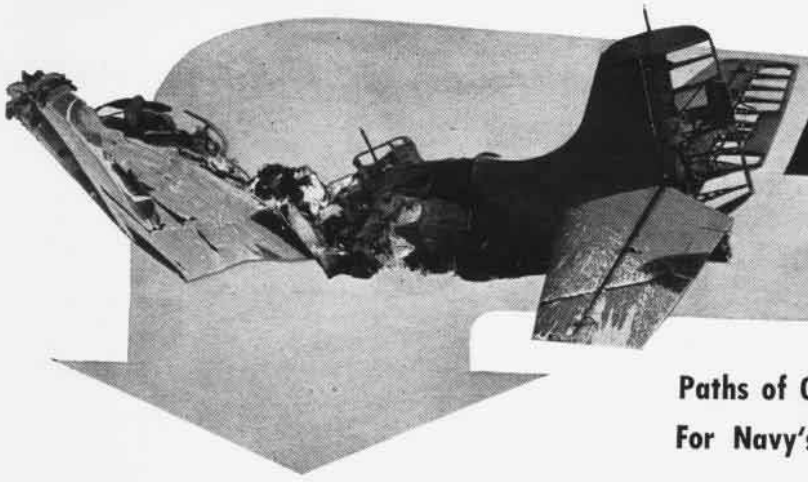
Overhaul Usage Forms Available

Overhaul usage tabulating forms ("L" forms) on airframes material for the major plane types are now available. Hereafter these forms will contain a selected list of items coded "M" and "M1" in accordance with ACL 128-44.

Rocket Selector Switch Change

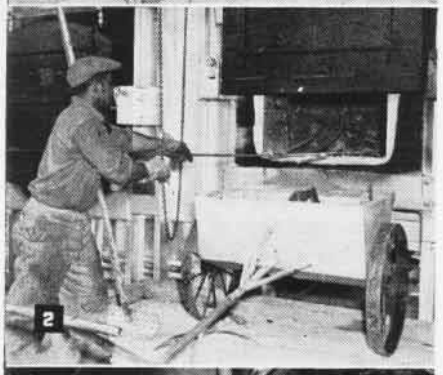
A contract has been let to convert 500 rocket selector switches Mk 1 to station selectors Mk 1-1. This change provides for a new dial and index stops for bomb release circuits and a larger electrical connector for greater current capacity. The new units will be interchangeable between rocket and bomb release circuits.

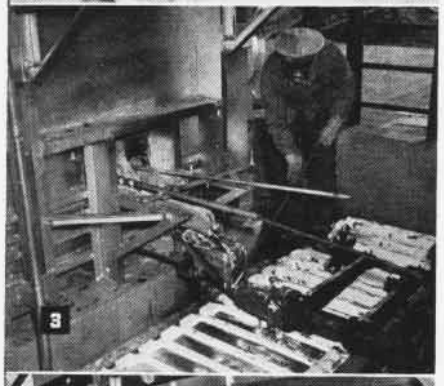
Anticipated production will provide all VBT types and the P2V with station selectors Mk 2-0 beginning in February. A contract has been let with the Federal Electric Company of Chicago for production of 1000 station selectors Mk 2-0. Laboratory tests at the Naval Research Laboratory showed the selector to be satisfactory.

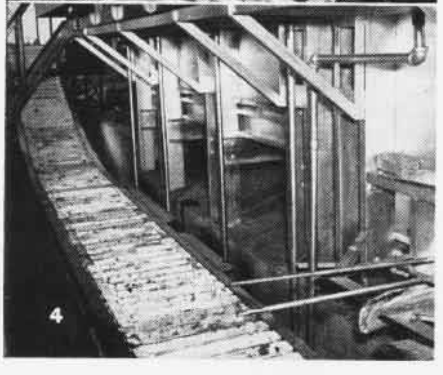


Airplanes to Ingots

Paths of Glory Lead to the Melting Furnace For Navy's Nonflyable, Nonusable Aircraft







IN AN ASSEMBLY line salvage operation at NAS JACKSONVILLE, scrapped over-age nonflyable naval aircraft are fed into a furnace and six hours later pour out as shiny 20-lb. aluminum ingots. In this form wings and fuselages of planes that once carried Navy men into combat and on training missions feed back into commercial channels to become window frames, linoleum stripping, ornamental fixtures and alloys for the steel or chemical industries. Both Bureau of Aeronautics and Bureau of Supplies and Accounts cooperated with the local station in setting up the aluminum salvage program. Jacksonville's modern, oil-heated reverberatory furnace turns out 30,000 lbs. of aluminum ingots in a 24-hour day. A stock pile in excess of three million pounds of scrap now awaits salvage at that station.

POURING BY HAND

Three shifts of six men each operate the $30,000 Jacksonville furnace on an around-the-clock basis. It takes three heats, each requiring about six hours, to produce the daily quota of 30,000 lbs. of ingot aluminum. Fifteen tons of ingots represents about 45,000 lbs. of scrap aluminum, or the wings and fuselages of some 18 naval aircraft. One *Helldiver*, melted down, can be carried away in the form of 127, 20-lb. ingots.

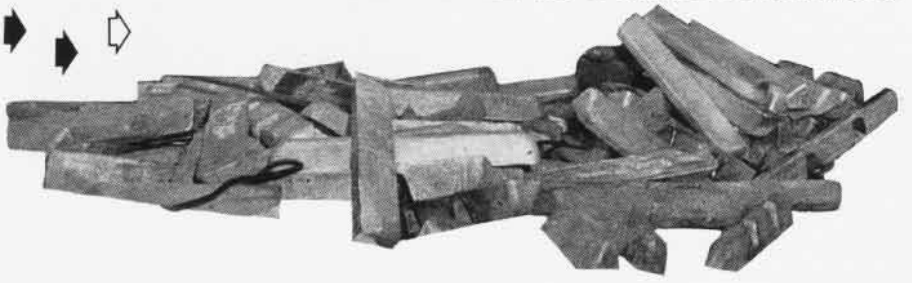
Scrap aluminum is fed into the furnace and kept at a temperature of 1350°F. for six hours. During that time the aluminum sweats out in a viscous condition and flows into the collecting hearth. Pieces of iron and copper in the scrap will not melt under these temperature conditions and must be removed from the furnace by cleaning tools.

The Jacksonville reverberatory furnace has a five-ton capacity melting pot that holds molten aluminum until the drossing process is completed. Before any metal is poured a small sample, the size of a silver dollar, is removed for spectograph analysis. On the basis of this analysis it is possible to pour 10,000 lbs. of ingots of approximately identical quality. While the Navy does not propose to guarantee the quality of ingots of salvage aluminum, the mission of the operation is to produce the best quality ingot commensurate with an economic degree of pre-melt removal of known concentrations of lead, zinc, magnesium and iron. The resultant metal has commercial value.

Melting furnaces at NAS SAN DIEGO and NAS ALAMEDA, now in operation, have approximately the same output as the Jacksonville unit except that they do not have the holding bath and for that reason cannot produce ingots in five ton lots of a given quality.

Smaller melting type furnaces are in operation at NATB CORPUS CHRISTI, NAS NORFOLK and NAS MIAMI. The Corpus operation was started under the supply department there in August 1944. Corpus Christi's melting furnace produced 1,152,539 lbs. of aluminum in ingots up to mid-November 1945.

1. STRIPPED OF SALVAGABLE PARTS, WINGS AND FUSELAGES ARE FED INTO FURNACE
2. DROSS IS REMOVED FROM FURNACE BEFORE POURING; JAX INGOTS ARE 94% PURE
3. MOLTEN ALUMINUM POURS FROM CONTAINER INTO INGOT MOLDS MOUNTED ON BELT
4. ALUMINUM QUICKLY HARDENS ON MOVING BELT; MAN AT LINE END REMOVES INGOTS



Harp Holds Down Radar Return

MAG-53—The ground return from SCR 720 radar gear was so strong and persistent that weak aircraft echoes were obscured completely, this Marine air group found. Considerable experimenting was done with ordinary tinfoil on the lower portion of the radome.

This helped the situation, but still was not the answer. S band harp finally was procured and initial experiments seem to indicate that when the correct pattern of harp is installed on the radome the problem will be solved.

▸ ***BuAer Comment*—Use of harp material, both X and S band, to reduce ground clutter and altitude line has been in effect for some time. The correct pattern for the F7F-3N using SCR 720 radar has not yet been worked out although there is a project at Patuxent for this purpose. Delay has been caused by plane non-availability.**

Fix for Porpoising of Privateer

HEDRON 14-2, FAW-14—Tests run on a PB4Y-2 aircraft which began to show a tendency to porpoise after about 95 hours of operation indicated that the pitching became evident at speeds above 170 knots, and excessive turbulence in airflow over the horizontal stabilizer was noted. Elimination of this turbulence by a very slight bending of the horizontal stabilizer trailing edge completely stopped the porpoising characteristics of the aircraft.

The trailing edge of the stabilizer was found to be uneven and bent in some places to approximately 1/16 inch out of line with the slipstream. This apparently caused excessive turbulence and uneven elevator pressures.

A flat bending tool of the pincer type was manufactured locally for use in aligning the trailing edge. Metal templates were also made to assure the correct amount of bending. Several *Privateers* given this corrective treatment have proved to be perfectly stable at all speeds up to 260 knots. Porpoising, a potentially serious flight hazard especially at the high speeds and low altitudes necessary in masthead bombing and strafing, apparently does not develop in new aircraft until they have been flown long enough to limber up the control cables.

▸ ***BuAer Comment*—Correction of porpoising of PB4Y-2's by using a flat pincer type tool to align the trailing edge of the stabilizer and bend the upper and lower trailing edge at a slight angle is satisfactory to BuAer as a quick and temporary fix *only*. Consolidated-Vultee is now preparing for BuAer approval a service bulletin which gives a permanent fix and covers installation of a beveled micarta strip on the upper and lower trailing edges of the stabilizer. This permanent fix will be issued soon to all fleet activities.**

SCREEN NEWS

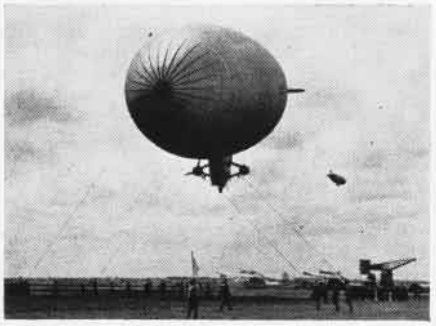
Just Like Hollywood. How did the corpse get to be that way is one of the problems posed in—yes—a training film on teaching methods. Though dramatized into an entertaining package, the picture gives a sound summary, stressing thorough preparation, proper presentation, and check-up and review. Robert Taylor plays the lead in this instructor training film.

MN-5795G
Methods of Teaching (Nonclassified—33 min.)

It's Up to You. This latest Navy V.D. film presents the facts in a clear, common-sense manner. Emphasized are the importance of taking necessary precautions and reporting to the medical officer. The film will replace MN-38 *Sex Hygiene* (Navy Version), prints of which will later be withdrawn from the field.

MN-38B
It's Up to You—V.D. Facts (Nonclassified; 21 min.)

How the Other Half Lives. A film on Lighter Than Air Training is being distributed to LTA activities for training use and to libraries for general interest screenings. Al-



FILM GIVES WORD ON OPERATING BLIMPS

though edited, narrated, and produced by naval personnel, the film is based on photography shot by the Army Signal Corps. The picture surveys feel of free flight, emergency landings, airship inflation, flight in trainers and service airships, convoy protection, and rescue from land and sea.

MN-6135
Lighter Than Air Training (Nonclassified; 16 min.)

Grampaw Again. As usual, Grampaw Pettibone is really griped. This time the verbal tongue-lashing is beamed at the pilots who foul up the join up.

MN-4353B
Flight Safety — Grampaw Pettibone's Gripes: Join Up Collisions (Nonclassified; 5 min.)

Eddy Knew the Angles. There's always a smart boy who can cut the corners, break the rules without drawing extra duty, take a bit of fan-tail liberty, and get in a few puffs while the ammunition is being stowed. And, if he knows the angles, he figures he can't lose.

The only trouble is—it just doesn't work out that way. The angles get scarce. The story of Eddy, a popular chap who started with a few minor infractions and ended up with a court martial and trouble with civilian authorities after his D.D., should be of interest to all hands.

MN-5010B
Conduct Ashore—Too Many Angles (Nonclassified; 48 min.)

More Hits—Less Danger. Shorter bombing runs and greater accuracy are promised for the newly developed toss bombing technique, subject of one of the Navy's newest training film releases. The picture briefs personnel on toss procedure for bombs, rockets, and torpedoes.

MN-6184A
A Report on Toss Bombing (Restricted; 18 min.)

The General Kept His Appointment. Although it's an Army film dealing chiefly with the role of General MacArthur's forces from Corregidor in February of 1942 to the signing of the peace aboard the *Missouri*, "Appointment in Tokyo" should be of interest to naval personnel. Prints have been shipped to all libraries.

MA-1859
Appointment in Tokyo (Nonclassified; 53 min.)

As They See It. Top men in Japan's wartime military, naval, and industrial circles face the camera and explain some of the reasons for their defeat. This documentary-type film is *not* being distributed to aviation film Libraries but will be available from Public Information Officers and Training Aids Libraries on a short-term loan basis.

MN-9139A
Report from Tokyo 1946 (Nonclassified; 19 min.)

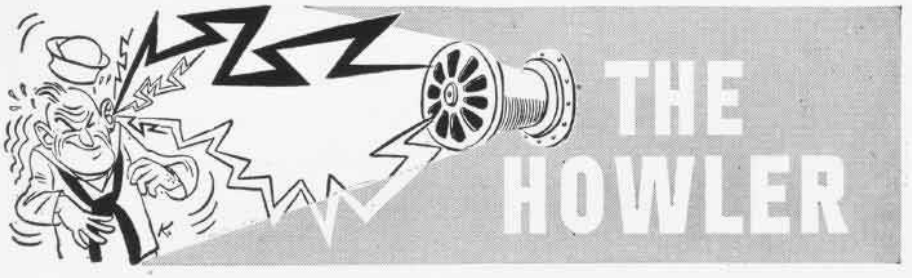
Where to Get 'Em: Central Aviation Film Libraries and Sub-Libraries are listed below:

NAVAL

NAS Navy #115	NATB Corpus Christi
NAS Navy #116	NATB Pensacola
NAS Navy #117	NAAdvTraC Jacksonville
TAL Navy #128	NAT&EC Lakehurst
NAS Navy #720	NAS Alameda
TAL #2 Navy #926	NAS New York
CASU(F) 42 FPO San Francisco	NAS Patuxent
NAS Kodiak	NAS Quonset
NOB Norfolk	NAS San Diego
NAMC Philadelphia	NAB Seattle
NAMTD Memphis	

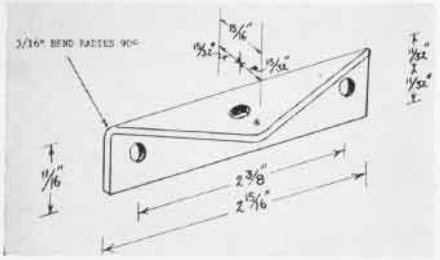
MARINE CORPS

MCAS Navy #61	MCAS El Toro
MCAS Cherry Point	MCAS Parris Island
MCAS Eagle Mt. Lake	MCAS Quantico



Entrance Hatch Locks Corroding. Reports of corrosion of the entrance hatch locks on PBM-5 airplanes have been received by BuAer. Activities operating these planes should keep the entrance hatch lock handles lubricated with Dow Corning compound No. 4 in order to prevent possible salt water corrosion. It is also advisable to post a decal near the locks indicating the proper lubricant to be used.

Fuel Line Bracket Support on J2F-5. Failure of J2F-5 fuel line, P/N 22830-27, extending from engine driven fuel pump to carburetor vapor eliminator has been caused by engine vibration which sheared grommet, P/N AN931/12-17, and allowed fuel line to bear against supporting bracket, P/N 22928.



FIX FOR BRACKET SUPPORTING FUEL LINE

The resultant chafing wore through wall of fuel line.

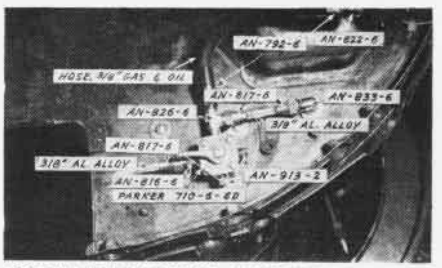
Field activities should inspect for this trouble and incorporate the following fix: Remove bracket, P/N 22928, and grommet, P/N AN931/12-17. Fabricate replacement bracket as indicated in cut. Material is .050 24ST anodized and zinc chromate finish. All holes are 5/32". Install new bracket and secure fuel line, P/N 22830-27, with Adel No. 12 clamp, AN742-D-14C, ASO stock No. R17-C-9478-95.

Parachute Seam Separations. When cleaning or handling parachutes, maintenance personnel must use proper precautions to prevent damage to the canopy material, particularly silk. Excessive tension or rubbing should not be exerted on any part of the silk, as this will cause the threads to slip. Seam separation may result, requiring panel replacement. If the seams are not actually separated, slipped threads may be moved to their proper place by brushing gently with a semi-stiff hair brush. (See November NANEWS for information on parachute cleaning.)

Prevent Brake Fluid Leaks. Reports from the field indicate leakage at brake swivel fittings on F4U-4 landing gear brake hose installations, with complete loss of hydraulic fluid resulting in failure of the brake system and possible loss of aircraft. The principal cause of the "banjo" fitting leakage appears to be either compression of the soft washer or elongation of the bolt. In either case a retightening of the fitting is required to prevent leakage.

Service activities should instruct maintenance personnel to inspect the "banjo" fitting at 30-hour checks for proper tightness of the bolt to insure against further failure of the brakes due to loss of fluid.

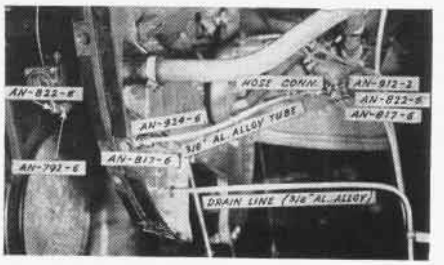
Prevent Ice in Lubricating System. Incorporation of a drain valve in the oil tank sump and oil drain valve, as recommended in Technical Note 84-45, was accomplished on 15 PBM-5 aircraft by Headquarters Squadron, FAW-8. The purpose of this installation is to preclude the possibility of engine failure due to excessive condensation in the oil system with resultant freezing while operating in cold climates. The following standard stock items were used to complete the change, with locations as indicated: (See cuts.) 1 bushing, reducing ¾" MPT x ¼" FPT, AN-912-2; 2 elbows 90° ¼" MPT x ⅜" flared tube, AN-822-6; 5 nuts, flared tube coupling, AN-817-6; 1 fitting bulkhead 90° ⅜" flared tube, both ends, AN-833-6; 1 locknut, bulkhead fitting, AN-924-6; 1 fitting, "T," 2 outlets ⅜" flared tube, 1 outlet ¼" MPT, AN-826-6; 1 connector, ¼" MPT x ⅜" flared tube, AN-816-6; 1 valve, Parker 4-way, all outlets ¼" FPT, PARKER 710-6-6D; 2 plugs, ¼" MPT, AN-913-2; 2 Aeroquip swivel hose couplings, AN-792-6; as required, tubing, aluminum alloy ⅜", hose, gas and oil ⅜" I.D.



INSTALLATION DRAWS MOISTURE FROM OIL

Although the drain valve is the lowest part of the system, single point drainage from that unit is not considered sufficient. The oil outlet is not the lowest point in the sump and therefore ice could form below the outlet, could loosen up during later operation and be drawn into the outlet, thereby starving the engine. Since the moisture originates from condensation inside the system after the engine has been in operation, several things must be remembered to insure trouble free performance. Regardless of the period of operation, if the oil is heated above the outside air temperature, it is possible for moisture to condense inside the oil tank and engine crankcase. The amount of liquid thus precipitated depends first upon the relative humidity of the outside air and second upon the total air volume inside the tank. Crew members can minimize the exposed area by keeping the tanks filled to service capacity at all times.

It is advisable to drain the water from the system after each run up. Draining should not be done until sufficient time has elapsed to insure against further condensation and that all liquid thus developed has drained down to the low points of the system. The ideal time would be when the oil has cooled to 20° C or less, but before such moisture has had sufficient time to freeze.



OIL SUMP OUTLET STOPS ICE FORMATION

To operate the system, unsafety and open oil drain valve to the drain position. Unsafety small Parker valve located on firewall inboard and below oil drain valve. Open to drain position. This valve has the handle pointing inboard when off and vertical when open. The water, being less viscous than the cool oil, should drain off readily, but caution must be observed to prevent undue loss of diluted oil. The amount of water thus expelled, for any single operation, will not exceed one pint.

Emergency Hydraulic System F4U-4. A recent squadron report of a crash landing due to failure of the emergency landing gear CO_2 system gives the following details: While on a night navigation hop, the pilot's attention was called by his division leader to loss of hydraulic pressure. The pilot's tail wheel was hanging partly out of the tail wheel well. Pressure read 50 lbs. The pilot slowed to 90 knots and made an unsuccessful attempt to lower landing gear, thereby losing his 50 lbs. of pressure.

Returning to base immediately, he notified the tower of his plane's condition, attempted to build up pressure by use of the hand pump, slowed to 90 knots, and used his CO_2 bottle which blew his right gear full down and the left gear halfway down. The pilot's visual indicators showed right gear down and locked, but technical observers in the tower did not concur that right gear had locked. Violent rocking of the wings and sharp pull-outs were used without results. The pilot, unable to get his flaps down, landed with the right wheel full down and left wheel half down, causing major damage to the aircraft.

The squadron further reports that investigation by Chance-Vought engineers on several F4U-4 aircraft revealed that when the CO_2 emergency system was used to extend the landing gear, the CO_2 passed defective shuttle valve seals, and entered the hydraulic reservoir, building up sufficient pressure to blow the cap off and allow escape of all the fluid.

BuAer has received several reports indicating failure of the emergency landing gear CO_2 system caused by the "O" ring seal in the shuttle valve becoming unseated and blowing out of its groove into the system. Tests conducted by contractor and service activities indicated that the system functioned normally the first time CO_2 was used, although the packing became unseated. On subsequent operation of CO_2 bottle the packing would be forced into the hydraulic system, resulting in complete failure of emergency system.

As a temporary measure F4U-F3A-FG Aircraft Bulletin 42, 22 August 1945, was issued recommending inspection of the valve after each operation of the landing gear CO_2 system to insure that the "O" ring seals are not injured and are properly seated. The contractor redesigned the shuttle incorporating a cage to prevent the seal from being dislodged. F4U-F3A-FG Aircraft Service Change No. 234, 22 January 1946, provides service kits for replacement of present shuttle. The necessary parts have been manufactured, and kits are being delivered by contractor.

Until the change is incorporated, the reset valve should have 30-hour inspections for the condition of the stem and seals. If corroded stem and defective seals are noted, replace the valves. It is not believed that the new slide type reset valve will have this difficulty.

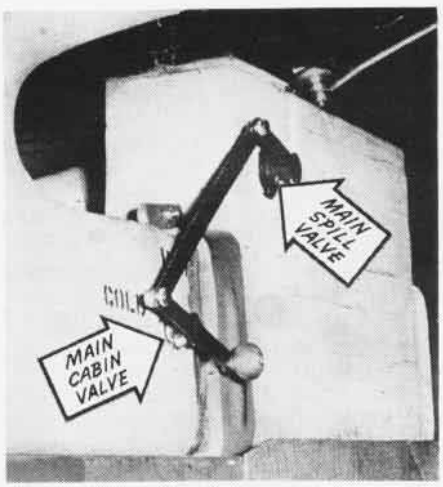
Wing Hinge Pin Sequence Valve. Corrosion is reported occurring on the plunger of the wing hinge pin sequence valve, P/N VS-12802, on F4U-4 aircraft. Maintenance personnel should be instructed in the application of the correct preservative, aluminum soap grease, specification AN-6-4, or Type I soft film corrosion preventive compound, specification AN-C-124. It is recommended that the plunger be inspected at every 30-hour check to eliminate corrosion.

PV-2 Hydraulic System. In a recent accident involving a PV-2 aircraft the hydraulic system had failed and the emergency system was used for a safe landing. The trouble came later when the pilot tried to taxi to the line—brakes failed and the plane climbed up on another parked aircraft. Pilots should be instructed that when the emergency system has been used, fluid for approximately three to five applications of the brakes remains in the brake accumulator. Under these conditions the pilot should request a tow rather than attempt to taxi the aircraft after landing. After several applications of the brakes he may find himself without braking action at a critical moment.

Investigation of this accident showed that the landing gear down line tube assembly in the nacelle slip joint collapsed and caused complete loss of hydraulic fluid when landing gear was extended. Maintenance personnel are warned that over tightening of the gland nut to prevent leaks may cause the sliding tube to bend and result in the collapse of the down line tube. Aircraft Service Change No. 164, paragraph 5 states the correct torque.

Check Valve Installation in R4D-1 Heating System. Activities operating R4D-1 aircraft having a PCA heating system installed are warned to inspect control valves of the system to see that they operate in proper conjunction.

A recent dangerous fire in an R4D-1 was traced to incorrect installation of the spill arm valve which allowed both the main spill valve and the main cabin valve to be closed at the same time, thereby preventing the excess heat from being spilled into the slip stream. It is possible to install the spill valve arm on the valve shaft in two positions, the correct position (see cut) being 180° from the incorrect. With the cabin valve in fully closed position the spill valve control arm will be parallel to the cabin valve control arm only if arm and linkage are correctly installed. A further check for correct installation can be made by rotating the cabin valve control smartly counterclockwise to the fully closed position. The spill valve which should then be in the open position can be checked through the negative scoop located on top of the engine nacelle.



CORRECT INSTALLATION OF HEATER GEAR

It is considered satisfactory to operate aircraft with combination PCA heating system and Douglas (R4D-6) exchanger, provided the control valves operate properly. However, to preclude all possibility of the Douglas exchanger being a fire hazard, tests will be conducted to determine if the temperature built up in the mixing chamber and ducts exceeds specifications of SR-107B.

Tail Wheel Oleos. Activities concerned with F4U-4 tail wheel oleo failures are referred to F4U—F3A—FG Change No. 232, incorporation of which will remedy difficulties.

This change, based on Chance Vought MCR 713 (F4U-1) and MCR 152 (F4U-4), has several advantages over the "bleeder plug" strut previously recommended in MCR 518. Basically the metering characteristics are considerably improved, and filling procedure is simplified. Drop testing revealed that during excessively hard landings, the hydraulic pressure developed within cylinder exerted sufficient hoop tension to cause a permanent yielding of cylinder wall. This condition was remedied by an increase in cylinder wall thickness. The addition of a new revised metering pin, and the increase in oil volume by raising oil level, all in conjunction with increased cylinder wall thickness, have improved metering characteristics. The filling simplification has been accomplished by elimination of the "bleeder plug."

Two hundred kits for use in making this change were shipped to service units in November, 200 in December, and 250 a month thereafter.

PUBLICATIONS

The following Aviation Circular Letters, Technical Notes and Technical Orders have been issued since 1 February 1946. Copies are available on request to Publications Division, Bureau of Aeronautics.

AVIATION CIRCULAR LETTERS

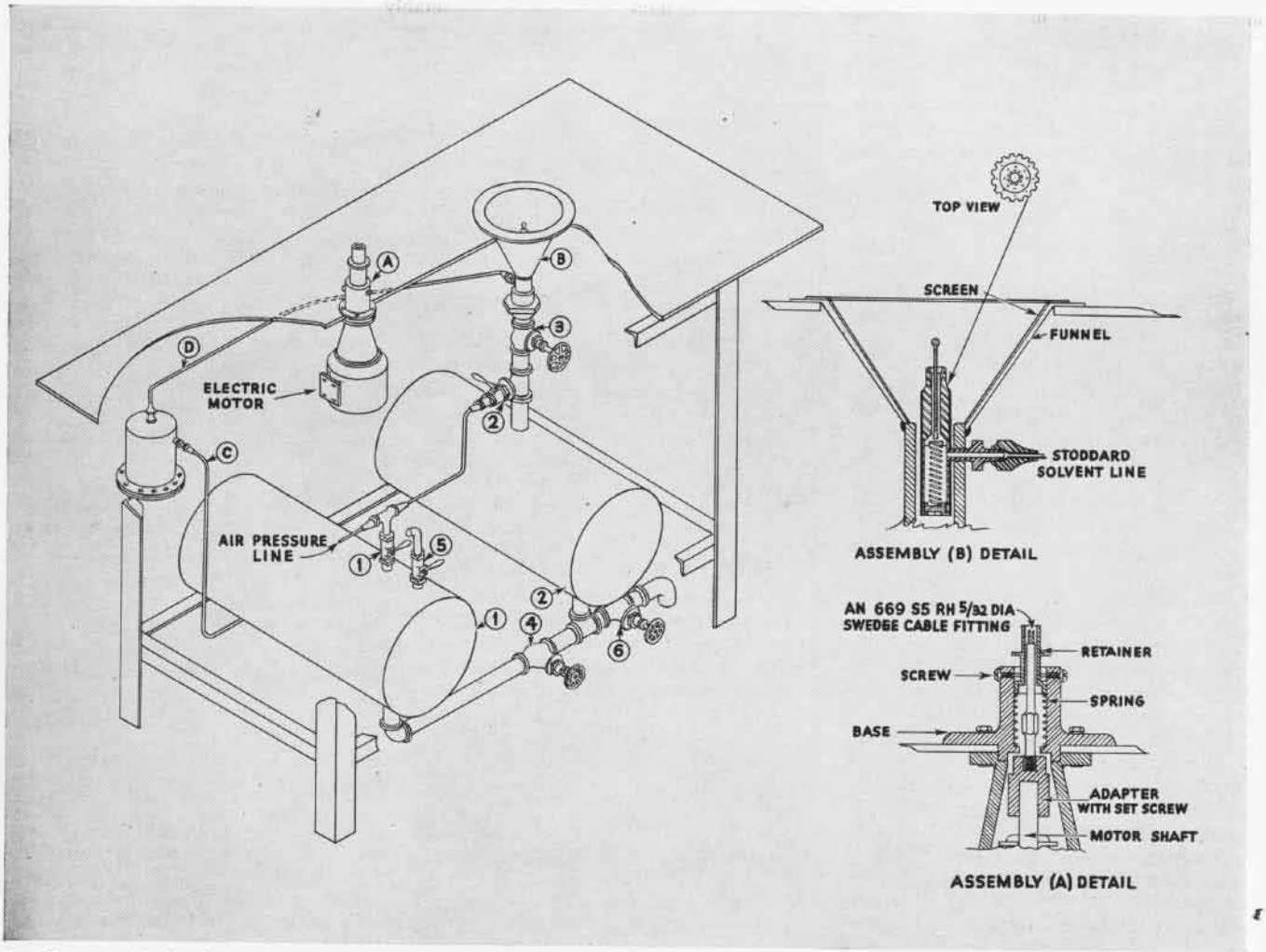
14-46 *Mutilation, Abandonment and Destruction of Government Property.*
15-46 *XPBM-5A and PBM-5A Model Designations; establishment of.*
16-46 *KDC-1 Aircraft Model Designation; Establishment of.*
17-46 *Surplus Property Peculiar to Aircraft Determined to be Scrap or Salvage and Engines Scrapped—Reports of.*
18-46 *Surplus Property Peculiar to Aircraft at Continental United States Naval Air Stations—Disposition of.*
19-46 *Aircraft Engine Log Books—Disposition of.*
20-46 *Defective Aircraft Tires and Tubes—Disposition and Handling of.*
21-46 *XOSE-2 Aircraft Model Designations; Establishment of.*
22-46 *Historical Reports—Preparation and submission of.*
23-46 *Water Injection Equipment on Fighter Type Aircraft—Disposition of.*
24-46 *(Joint Letter Bomb and Torpedo Handling Equipment, Smoke Screen Equipment, Tow Target Equipment, and Machine Gun Accessories—Change in Cognizance of.*
25-46 *Aircraft Tires; Inflation—Pressures for*
26-46 *SNJ-3C, 4C, 5C, and 6C Model Designations; Establishment of.*
27-46 *Aircraft Engines not Scheduled for Overhaul—Investigation of.*
28-46 *Airport Lighting—Army, Navy and Civil Requirements for Obstruction Lighting.*
29-46 *Propeller Overhaul and Salvage Program—Policy for.*
30-46 *Bureau of Aeronautics Section "W" Allowance List of Material and Equipment for Prolonged or Unusual Cold Weather Operations—Establishment of.*
31-46 *Aircraft Tire and Tube Recapping and Repair—Post War Program for.*
32-46 *Weight and Balance Control—Flight Clearance.*

TECHNICAL NOTES

4-46 *Assembly, Rescue—AR-1.*
5-46 *Lubrication Charts.*
6-46 *Information on Adjustment of DC Carbon Pile Voltage Regulators Eclipse Types 111144, 1002, 1260 and 1305.*

TECHNICAL ORDERS

5-46 *Inspection of Engines After Accidents Involving Sudden Stopping of Propellers or Damage to Propellers.*
6-46 *Model FR-1 Airplanes—Restrictions to be Observed in Operation.*
7-46 *Navy Quick-Fit Chest Type Parachute Harness.*



Operation: Stoddard solvent in tank (1); pressure applied through valve (1); solvent forced to filter through line (C); then through line (D) to spray assembly (B); drains to tank (2) to transfer solvent from tank (2) to tank (1); close valve (1); open valve (2); close valve (3); open valve (4); apply pressure; open valve (5) to vent tank (1); open valves (4) and (6) to drain tanks

CLEAN PLUG BARRELS IN NEW DEVICE

Because of difficulty experienced in cleaning the inside of spark plug barrels, removing rust from the end of the connector contact, and removing foreign matter from around the contact and the recess in the bottom of the barrel, NAS San Diego has developed a dual purpose spark plug barrel cleaning machine, a schematic sketch of which is shown above.

According to San Diego's experience, this machine performs a satisfactory cleaning job and expedites the operation of processing large quantities of spark plugs without damaging the mica or ceramic barrel insulation of the plugs.

The power driven unit, which consists of a 5/32" steel wire brush swaged to a shaft that is connected to a direct drive ⅛ hp electric motor, revolves in a fixed tube that telescopes when a spark plug barrel is placed over the tube and pressed downward. This permits the rotating brush to extend outward and make contact only with the surface to be cleaned.

Following the brushing operation, loose dirt and any oil or foreign matter are removed by a Stoddard solvent spray. This is accomplished by placing the spark plug barrel over the vertical nozzle on the air-actuated unit of the machine. When the spark plug is pushed downward, the nozzle valve is unseated and solvent is forced out of the spray nozzle by air pressure from the solvent tank. This effectively dislodges and washes away deposits of foreign matter around the contact and from the insulated walls of the spark plug terminal wells as the solvent escapes down the grooves inside the nozzle body. To obtain a thorough cleaning job the plug should be slightly rotated on the nozzle while sprayed.

After the spark plugs are cleaned and blown out with air, they are baked and tested in the usual manner. San Diego has experienced no trouble caused by absorption of the solvent in either mica or ceramic barrels.

Any authorized spark plug overhaul activity may obtain detailed drawings for construction purposes from NAS San Diego. The schematic drawing above (not made to scale) will give an understanding of the cleaning process in sequence of operations.

▶ ***BuAer Comment.*** **Actually there should be no need for rust removal from the terminal cap if Dow-Corning No. 4 ignition sealing compound is used in spark plug wells, as directed in BuAer General Engine Bulletin No. 21, since this compound excludes all moisture from the spark plug wells. (Supplement No. 1 to GEB No. 21 renders the use of Dow-Corning No. 4 compound mandatory.)**

It is believed that the combination barrel cleaning unit devised by NAS San Diego will expedite and facilitate spark plug barrel cleaning during plug overhaul. BuAer appreciates the interest and initiative of the NAS San Diego A&R personnel responsible for development of this device.

TECHNICALLY SPEAKING

Pilots and other aviation personnel will find technical orders and technical notes issued during the months of December and January listed here in summarized form. Reading these summarizations does not free pilots and other personnel of the responsibility of studying these TO's and TN's in their entirety.

TO 1-46 (*To be read by all pilots*)

Restrictions to be observed in the operation of model F6F-5 series airplanes are carried in this TO. The following are permissible maneuvers when not carrying torpedo, bombs, smoke tanks, rockets or similar items; loop, aileron roll, snap roll, chandelle, Immelman turn, wing-over, vertical turn, inverted flight, inverted spins, normal spins.

When carrying any of the aforementioned items the wing-over, roll, vertical turn and inverted flight are the only ones allowed. *Supersedes, cancels TO 126-44.*

TO 2-46

Directs that an interference filter be installed at first major overhaul of an airplane to minimize radio intereference which is being caused by transmitter-receiver dynamotors. Requires fabrication of a new mounting bracket per the drawing which accompanies this order.

TN 2-46

Provides information covering survival equipment gear and its use in cold climates. Various methods of installation of weather shields on the multi-place life rafts Mk 2, 4, and 7. Also deals with protection of rations, water storage bags, sleeping bags.

TN 3-36

This TN deals with steps being taken to eliminate a possible fire hazard, loss of aircraft, or system malfunctioning due to the failure of the Machined Products Company type B-4 relay, Part No. RB400. These relays are to be replaced in all aircraft except those having a 12-volt electrical system. Approved type relays may be obtained from established supply sources which have been stocked accordingly.

TO 98-45

Directs that before recharging a one-man pararaft CO_2 cylinder, the valve shall be opened and cylinder weighed to determine tare weight of the cylinder and valve. No attempt is to be made to recharge cylinder until tare weight checks with that specified for cylinder and valve. Purpose of this precautionary check is to prevent overcharging of pararaft CO_2 cylinders from which an accumulation of CO_2 snow may not have been fully exhausted.

TO 99-45

This order directs the installation of a special filter designed to reduce radio interference radiated from the low tension ignition leads of aircraft having R-2800 or R-2600 engines. Special instructions for installation of filters together with ASO stock numbers and distribution points are listed.

TO 100-45

Schedules for lubricating oil changes for all Naval Aircraft are established in this order. Exceptions are specifically noted and explained. This TO provides that only Navy Symbol Aviation Lubricating oil procured on contract from approved Naval suppliers shall be used in Naval aircraft. *Supersedes and cancels TO 129-44*

T.O. & T.N. Quiz

ALL NAVAL *and Marine aviators should be able to turn in perfect scores on this quiz if they have completed their required reading in BuAer TO's and TN's for November.*

1. **What is maximum permissible speed for unlimited use of ailerons on F6F-5 aircraft?**
2. **What is average recommended gross weight for this airplane on landing on prepared fields?**
3. **Where is the latest datum on modifications in center of gravity limits for all models of the PBM-3 and PBM-5 series airplanes to be found?**
4. **What are the maximum diving speeds at altitudes up to 10,000 ft. for SB2C-5 type planes? Where can VSB pilots find other up to date restrictions to be observed in the operation of SB2C type aircraft?**
5. **Restrictions on cruising RPM for certain models of R4D type planes have been placed in effect. Where can these restrictions be found?**

(Answers on page 40)

TO 101-45

Provisions for examination, testing and replacement of elastic shock cord, exerciser cord, bungee rings and parachute pack opening elastics are provided in this TO. Explanations of coding colors used to denote age of cord is listed to guide personnel in examination of elastic shock absorber and exerciser cord, to facilitate testing. *Supersedes and cancels TO 4-45 and TN 66-43*

TO 102-45

Specific directions for painting, repainting, cleaning and removing of paint from radomes is provided in this technical order. The order provides that hereafter all radomes will be finished at manufacturing source with a standard light non-specular grey paint and have words "Do Not Paint" stenciled prominently on surface of radome. *Supersedes, cancels Confidential TO E-44*

TO 103-45 (*to be read by all VR pilots*)

This TO restricts the cruising RPM of all model R4D-1, R4D-3, R4D-4, R4D-5, R4D-6 and R4D-7 airplanes equipped with R-1830-90C and -92 engines, geared at a ratio of 16 to 9. These planes shall not be operated continuously in the range of engine speeds between 1300 and 1700 RPM. *Supersedes TO 16-43*

TN 100-45

A method of minimizing the interference that occurs between the guard channel and main channel in AN/ARC-1 equipment by reducing the guard channel excitation is described in this TN. Equipment modified in accordance with this TN should be marked legibly on front panel below nameplate and on chassis near guard channel with letters "TN No. 100-45."

TO 4-45 (*to be read by all VPB pilots*)

Center of gravity limits for all models of the PBM-3 and PBM-5 series airplanes as contained in the Pilot's Handbook for Flight Operating Instructions and the Handbook of Weight and Balance Data, AN 01-1B-40, are modified in this technical order. Airplane characteristics obtained in recent tests conducted at NATC Patuxent River on a Model PBM-5 at a gross weight of 56,000 lbs. are listed in the TO.

TO 3-46 (*to be read by all VSB pilots*)

Restrictions to be observed in the operation of airplanes of the following series: SB2C-1, SB2C-3, SB2C-4, SB2C-5, SBF-1, SBF-3, SBF-4, SBW-3, SBW-4, SBW-5 are set forth in this TO. *Supersedes and cancels TO 101-44 and 35-45*

TN 101-45

A method of eliminating parasitic oscillations that are likely to occur in the cathode circuit of the power and amplifier stage when AN/ARC-1 equipment is operated in the region of 156 megacycles is described in this TN. Directions for the modification and distribution points for supplies needed to complete the modification are contained in the note, TN 101-45.

SERVICE Test
INTERIM REPORT DIGEST

F8F-1 (463 Hours' Test)

Hydraulic Distribution Panel. As previously reported, twisting movement of unloader valve installed on panel caused cracking of hydraulic tubing. Three point securing bracket to hold valve was manufactured locally. This installation has been satisfactory, giving 84 hours of operation without failure. It is recommended as field fix. No recommendations will be made to contractor pending development of newly designed hydraulic system for later model F8F-1 planes.

Hydraulic Actuating Cylinders. New prototype hydraulic cylinders (nitrided pistons, Parker lubrited pistons), furnished by Grumman, have operated satisfactorily with no failures during 75 hours of service test.

Exhaust Systems. Prototype No. 1 has had three additional failures. First occurred after 85 hours of operation on Nos. 3 and 5 cylinders assembly, Grumman P/N 55327, at the cylinder mounting flange spot welded collar of No. 5 cylinder. Failure is attributed to loss of the assembly's tail pipe clamp. Until failure of this assembly none of the tail pipes was dimpled aft of clamps, thus only the 35 in. lb. torque on the clamp bolts was holding them in place. *Recommend* that all tail pipes be dimpled by manufacturer.

Second failure occurred after 208 hours on Nos. 1 and 17 cylinder assembly, Grumman P/N 55325, at the cylinder mounting flange spot welded collars of both cylinders. Cause of this failure also was loss of tail pipe clamp. After loss of tail pipe clamp and failure of mounting flange collars, assembly dropped down allowing expelled exhaust flames to stripe both ignition leads and engine flash shroud, scorching them badly. If unnoticed in flight, very dangerous condition would have developed.

Most recent failure occurred at 217 hours with crack at junction of No. 16 cylinder pipe and the welded reinforcement web.

Prototype No. 2 has had three failures, the first, after 125 hours, on Nos. 3 and 5 cylinder assembly, Grumman P/N 55327. Failure was same as on prototype No. 1 except for loss of tail pipe clamp. Second failure occurred on Nos. 1 and 17 cylinders assembly, Grumman P/N 55325, which is of the slip coupling connection type. This is the first failure of this assembly and is believed caused by improper allowance for expansion in design of reinforcing web at junction of two cylinder pipes. Only the reinforcement web cracked. Assembly had 134 hours of operation at time of failure.

Third failure on prototype No. 2 occurred on manifold Grumman P/N 55330 which cracked at end of reinforcement web on No. 8 cylinder after 162 hours. Failure is believed due to P&W exhaust pipe and stud assembly becoming loose at cylinder flange hold down studs of No. 10 cylinder. Threads in stud holes of this cylinder exhaust port were all found stripped. This installation was made by contractor and amount of torque used in installation of P&W extension is not known. Either the studs or the P&W extension securing nuts were improperly torqued. First failure of this type is believed an isolated case.

Solar Seamed P&W extension No. 16 cracked around the mounting flange after 440 hours. Failure may be due in part to loss of tail pipe clamps which could put undue strain on this extension.

Exhaust Troughs. Troughs, previously reported installed, now have 75 hours of operation without any visible cracks or failures.

Wing Outer Panel. Inspection of wing station 175 showed that all the 3/32" lower skin rivets and several of the upper rivets were loose. To replace rivets both ailerons had to be removed. Both aileron hinge bolts at station 175 were worn on upper and lower sides. Reason for these bolts wearing more than the inboard and outboard hinge bolts is probably the designed weaker construction of station 175 and the use of a "KF" Fafnir type bearing on the hinge horn bracket. It is believed that a pivot point in the normal wing flex is being created at this station during high "G" maneuvers instead of being evenly distributed throughout the wing span. *Recommend* that a self-aligning type of bearing be installed at wing station 175.

Ammunition Box. After lip of bell mouth, P/N 56841, port outboard 50 cal. gun, is about ⅛ inch forward of the after lip of the ammunition box. In feeding to the port outboard gun the base of a 50 cal. cartridge binds on the after lip of the bell mouth, causing very frequent gun feed stoppages. *Recommend* that alignment of ammunition box, bell mouth and gun cartridge guide be insured by proper size opening and alignment of outboard feed chute assembly, P/N 56814-1.

Generator. A negative lead on generator, model 1298-1A, worked loose after 459 hours at generator terminal block. Vibration caused arcing which melted negative terminal post, causing a short to frame and unsoldering lead going to field from brush terminal post. The loose field lead caused erratic operation upon striking the cover plate. This failure, due to absence of a lock washer on negative terminal, ended the LHH brush life test on the generator after 155 hours of flight with total wear of .1622 of an inch. *Recommend* that units having brush wear trouble investigate generator blast cooling systems to insure a minimum of 75 cubic feet per minute to the generator, a total of six inches of water pressure.

FR-1 (293 Hours' Tests)

Wheel Well Doors. Port wheel well door was badly torn and folded back along the leading edge. Damage is due to heavy air loads on door when it comes partially open during high speed flight. *Recommend* that positive up lock be installed on leading edge of wheel doors.

Service Changes. The following Ryan Service Changes were complied with: 24. canopy, track trolley stop; 25. fuel system, vent line check valves; 26. cowl supports, spring assembly; 28. bushing, arresting gear upper retracting link; 29. thermal relief valve in hydraulic system; 33. power factor correction condenser; 34. gun receptacle dust caps; 36. tube oil breather 38. nose gear drag strut beam assembly; 39. nose gear fork replacement.

Fuel Selector. Fuel selector valve operator switch, BZ-3RW22T, type W, located in the nose wheel well did not operate with the main fuel selective valve cam. Investigation showed that when the circuit was completed the cam was in the opposite position. Connecting wire Q25-20 on the switch was connected incorrectly at the factory. Wire was changed to the third terminal of the switch so that the circuit was completed with the cam in the right position, the flat surface on the switch.

Gun Camera Shock Mounts. Upper and lower shock mounts, R42-I-414-960 AN-8008-F1, failed after 240 hours. These insulator vibrators, believed to be too small, were replaced with the next larger size.

Jet Unit. A new I-16-C6 jet unit was installed. On initial turn up the lubricating oil smelled of gasoline. Oil was changed and engine turned up again with same result.

As no test facilities were available for JP accessories, the governor, fuel starter pump, and fuel pump were changed, and unit operated satisfactorily.

Blower Control Lever. Lever would not stay in high blower position. There is no positive lock or detent on this lever. *Recommend* that one be incorporated on the blower control.

Starter Relay Junction Box. Cable (continuation of circuit cable K17-2) from receptacle, AN 3102-20-2S, in the starter relay junction box to starter relay switch terminal is too long and is rubbing against the relay junction box cover, causing chafing. This circuit is from the main bus and supplies power for the starting motor. It is not fused, and more care should be taken on inspection for protection of the cabling. *Recommend* that the starter relay switch be moved in a horizontal instead of vertical position. This would facilitate routing the cable direct to the switch terminal and eliminating excess cable and chafing.

Voltage Regulator. Test pin jacks on P/N 3GB1A18A, do not have lock washers and have become loose from vibration. Lock washers were provided to generator voltage test pin jacks to prevent backing out due to vibration.

Steel Locking Clamps. Clamps used in this

aircraft are not approved by BuAer and are unsatisfactory for aeronautical use. Rubber inserts become loose and fall out. The clamps become loose and open up, permitting the wires to drop out. *Recommend* that AN 742 clamps be used throughout the aircraft to provide a positive method of securing cables.

Nose Wheel Receptacles. Connecting wires are soaked with oil. *Recommend* either that entire cabling in this compartment be run through oil proof cables and junction boxes or that all electric wiring be relocated outside this compartment. NavAer 182 installation specification, "Soldering and water proofing of electrical connectors," should be complied with.

Gun Heater Receptacles. Receptacles on port and starboard wings are left open with no protection from dirt and water. *Recommend* that covers be provided.

F2G-1 (190 Hours' Test)

Spark Pl LS-86 type plugs have been operated for 112 hours satisfactorily.

Propeller Governor. At 95 hours the propeller governor control rod support located 5" from propeller control carried away. Failure was attributed to use of elastic stopnuts. New unit was manufactured and replaced in 6 man-hours using castle-nuts with cotter pins, and no further trouble is anticipated.

Vacuum Pump. Single vacuum pump drive (gear box), P/N 77918, failed while attached to R-4360-4 engine, because of oil starvation. Allen plugs in oil supply passage on vacuum pump drive mounting pad and in oil supply line serving the accessory drive adapter, P/N 97918, had not been removed. *Recommend* that contractor annotate all future R-4360 type engines to emphasize need for removing the Allen plugs before installation of gear boxes.

Exhaust Stacks. After 98 hours of engine operation, exhaust, stacks P/N R-88-G-60313-8 and R82-G-60319-7 serving cylinders A-5, C-5 and A-7 failed. Cause is under investigation.

After 160 hours of operation, exhaust stacks serving B-7 cylinder, P/N G60313-7, and B-4 cylinder, P/N G60314-7, broke. The fractured exhaust stack caused the two magneto leads to A-7 cylinder to be burned completely through. Rubber intake hose connections were scorched where not covered by metal shielding. It is believed that metal shielding prevented the rubber intake hose from burning through, averting probable engine fire and subsequent engine failure. Vellumoid gasket, P/N PW99338, on A-7 cylinder intake rocker box developed a leak and had to be replaced. Leak was caused by exhaust flames from broken exhaust stack on B-7 cylinder, P/N 60313-7.

After 25 hours of operation on the engine the exhaust stack serving B-7 cylinder, P/N 60317-7 failed. Also at same time the exhaust stack serving A-5 cylinder, P/N 60319-7, failed after 130 hours of operation.

Exhaust stack serving B-4 cylinder, P/N 60314-7, failed again during this interim after an additional 35 hours.

Intake Pipe Flange. The following intake pipe flange to cylinder gaskets, P/N PW 72224, on cylinders A-3, B-3, D-3 had to be replaced because of leaks. Cause of failure is not known.

Brake Discs. A complete set of brake discs, P/N GY275709 and GY350040, had to be replaced after 115 hours and 131 taxi miles. Left brake is satisfactory.

Cable Chafing. Friction tape is used throughout the electrical cabling installation for anti-chafing purpose under clamps used to support the flexible conduit, to fill up the space in the AN-3057 adapters, at several points in the electronics systems cabling, and to support cables and cable groups to fuel and hydraulic lines. *Recommend* that suitable rubberized chafing material be substituted for the friction tape.

XBT2D-1 (Preliminary Inspection)

This is a single engine, single place dive bomber-torpedo plane designed for use aboard an aircraft carrier. The plane is above average in accessibility.

Arresting Gear. Installation appears unsatisfactory due to flimsy construction of the centering device and lateral stop mechanism on the tail hook. Tail hook should be redesigned or reinforced at centering device before airplane goes into production.

Tail Hook Up-Lock. *Recommend* that hook used for locking the tail hook in up position (station 436) be recessed. In present location hook is liable to be damaged.

Engine Mount. Mount is sturdy and well constructed, but the conventional steel tube mount would provide increased accessibility to accessory section. Steel tube mount is most practical for maintenance. BuAer comments concerning overhaul practice for the metal sheet type engine mount are requested.

Hydraulic Pump. Hand pump required 586 strokes and 3½ minutes to fold wings from spread position. *Recommend* that an emergency electric hydraulic pump replace the present hand hydraulic pump and that reserve hydraulic oil quantity be increased. A separate emergency hydraulic oil reservoir would minimize loss of hydraulic fluid in case of failure of main tank.

Hydraulic Reservoir. Stand pipes are used to reserve a fluid supply of 0.4 gallon for emergency extension of main landing gear. An emergency control valve directs fluid from hydraulic reservoir to hand pump. Fluid under pressure from hand pump is transmitted to shuttle valves at main landing gear actuating cylinders through a separate set of lines independent of normal hydraulic system. Emergency pressure is not directed to tail wheel gear. Arrangement is considered inadequate, as any failure in main hydraulic tank will cause failure of both normal and emergency systems. *Recommend* that a compressed air or CO_2 bottle be installed for emergency system or that an emergency electric hydraulic pump with separate reservoir be employed.

Pitot Tube. Tube, P/N F.S.S.C. 88-T-2875, is installed near leading edge of right wing just outboard of mk 51 bomb rack installation. *Recommend* relocation since pitot tube in present position will obstruct servicing 20mm wing guns and rearming mk 51 wing bomb rack.

Fuel Tank. Single fuel tank with no reserve provisions is considered unsatisfactory. A stand pipe reserve or fuel counter connected to the fuel line leading to the engine, similar to that installed in the P-80, should be provided. *Recommend* also that fuel transfers system similar to that in F4U-4 be installed.

Link Ejection Chutes. Ejected links passing through link ejection chute "hang up" on the skin of the lower wing surface, causing a link jam gun stoppage. *Recommend* that link ejection chutes, both port and starboard, be lengthened so that chute is flush with skin of lower wing surface.

AVIATION ORDNANCE

INQUIRIES SHOULD BE ADDRESSED TO THE CHIEF OF BUREAU OF ORDNANCE

Transfer of Cognizance Made to BuAer

Transfer of cognizance of certain items of material from the Bureau of Ordnance to the Bureau of Aeronautics has been made in accordance with the joint circular letter to All Ships, Stations, and Units Concerned with Naval Aircraft (Bureau of Ordnance Circular Letter No. NAVORD OCL V1-46 Aviation Circular Letter No. 24-46) dated 13 February 1946.

Ordnance Reports of Defective Ammo

Bureau of Ordnance Circular Letter AV 1-46, first of a series of digests of reports of unsatisfactory or defective aircraft ammunition received by the Bureau has been issued. Purpose of this digest is to acquaint all aviation activities with these reports and by brief comment to advise regarding corrective or preventive action.

BuOrd Circular Letters XV3-45 and V9-45, covering reports of unsatisfactory or defective aviation ordnance material (other than ammunition), also have been issued.

Detailed reports on defective ordnance are of utmost importance to this Bureau in "improving the product" and developing satisfactory maintenance techniques. Prompt submission of such reports therefore is requested. The fact that defects already have been publicized should not deter activities from submitting additional reports on the same subject, as the Bureau desires to be informed whether malfunctions resulting from defective material are isolated cases or are a common occurence.

Furthermore, important details may have been omitted from reports previously submitted, and facts supplied in additional reports may alter the analysis that was made.

Signal (Distress Day and Night) MK 13

The signal, Mk 13 Mod 0, is a combination distress signal for use under day or night distress conditions, or both. Because of its small size it can be carried conveniently in pockets of live-vests, flight suits or life rafts. It is particularly adapted for use by aircraft pilots downed at sea.

This signal is similar in appearance and operation to the Signal Distress, Smoke, Hand, AN Mk 1 Mod 1. Whereas the Signal AN Mark 1 Mod 1 is a smoke signal for use only under daytime distress conditions, the Signal Mk 13 Mod 0 contains the same orange smoke canister in addition to a pyrotechnic flare pellet for use under night distress conditions.

The signal consists of a metal cylindrical outer case 5⅝ inches long and 1⅝ inches in diameter. Weight of the signal is 6.4 ounces. Both ends of the metal tube are closed by a soldered cap to which is attached a pull ring for insertion of the index finger. Upon removal of the soldered closing cap, a brass wire attached to the bottom thereof is pulled through a small cup coated with a friction igniting composition.

This action results in igniting the pyrotechnic flare or the smoke composition depending on which pull ring is removed. The burning time of the smoke of flare is about 18 seconds. The soldered caps on both ends of the signal are covered with a paper cap in order to prevent the possibility of an accidental pull on the pull rings. These paper caps should be removed sometime before actual use, in order that the pull ring will be readily accessible when desired.

The signal body carries an illustrated decalcomania which shows in detail the method of operation. The flare end of the tube (for night use) can be identified by a series of embossed projections extending around the case approximately ¼" below the closure.

After one end has been used, the signal can immediately be doused in the water in order to cool the metal parts. The signal can then be retained for use of the opposite end when required. Each section of the signal is well waterproofed and insulated against transfer of heat from one section to the other.

Succeeds List of 1 February 1946 — *1 March 1946*

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

Aircraft	Bulletin	Date	Change	Date
F6F	133	1-9-46	96	12-20-45
F4U-F3A-FG	272	2-12-46	240	2-15-46
F7F	29	1-16-46	32	1-4-46
F8F	9	2-12-46	10	2-14-46
FR	11	11-7-45	12	1-25-46
GH-NH	13	12-13-45	22	6-15-45
PV	179	1-31-46	190	2-15-46
PBM	166	2-11-46	181	12-29-45
PBY	142	2-15-46	187	10-19-45
PB2Y	74	10-19-45	156	8-9-45
PB4Y	224	2-15-46	192	2-7-46
R5C	72	1-28-46	157	12-18-45
R4D	55	1-28-46	48	10-3-45
R5D	86	2-11-46	141	2-18-46
RY	88	1-21-46	35	2-7-46
SB2C-SBF-SBW	232	1-24-46	159	2-12-46
SC	99	1-30-46	48	12-20-45
TBF-TBM	220	1-25-46	247	12-5-45
TBY	23	2-18-46	6	10-26-45

For complete list of Aircraft Service Changes and Bulletins, see Naval Aeronautics Publications Index NAVAER 00-500 and supplement 00-500A.

Modification of .50 cal. Cover Latch

Recently a modification of the cover latch to expedite raising the cover of .50 caliber Browning aircraft machine guns in crowded TBM-type turrets has been brought to the attention of the Bureau of Ordnance. Gunners have been experiencing difficulty in turning the latch and lifting the cover as sufficient pressure could not be had, due to using the right arm across the body and gun.

COVER LATCH HANDLE IS MOVED INBOARD

By moving the handle of the cover latch from the outboard to the inboard side of the gun and brazing a 4½" piece of ½" tubing to the cover latch, enough leverage is obtained to easily open the cover latch without undue exertion. The tubing is notched in the after end after being preshaped to obtain a better finger hold.

Interested activities can perform this modification if they so desire with locally procured materials. This modification was suggested by an aircrewman of VTB-6.

Mk 13 Distress Signal Due in the Fall

On the basis of information previously disseminated, several requests for the Mk 13 Mod 0 distress signal (day and night) have been received. It is estimated at this time that the Mk 13 Mod 0 distress signal will not be available for issue until October or November 1946.

BuOrd Has No Shotguns to Sell Now

Bureau of Ordnance has not sold any surplus shotguns, and does not have any procedure established at present for sale of them. In the event this Bureau should have shotguns for sale in the future, notification will be by official correspondence.

Succeeds List dated February 1946

LATEST BULLETINS ENGINE, AUXILIARY POWER PLANT, ACCESSORY, PROPELLER Dated 1 March 1946

ENGINE	BULLETIN	DATE	SUBJECT	EXPLANATION
PRATT & WHITNEY				
R-985	176 Rev. 2	1-23-46	*Piston Ring Arrangement*	To give the proper piston ring arrangements on P&W engines to insure correct installation in service
R-1340	194 Rev 2	1-23-46	*Piston Ring Arrangment*	To give the proper piston ring arrangements on P&W engines to insure correct installation in service
R-1830	326 Rev. 2	1-23-46	*Piston Ring Arrangement*	To give the proper piston ring arrangements on P&W engines to insure correct installation in service
	448	1-23-46	*Impeller Shaft Front Oil Seal Ring Liner Assembly Drift*	To give instructions for reworking PWA-2140 to insure proper alignment of the oil holes of the front oil seal ring liner with the oil holes of the blower case of applicable engines
	450	1-24-46	*Spark Advance Operating Unit Interference*	To give instructions for reworking the spark advance operating unit to prevent interference between the spark advance operating unit and the latest type ignition harness used on R-2000-9 engines
R-2000	54 Rev. 2	1-23-46	*Piston Ring Arrangement*	To give the proper piston ring arrangements on P&W engines to insure correct installation in service
	135	1-23-46	*Impeller Shaft Front Oil Seal Ring Liner Assembly Drift*	To give instructions for reworking PWA-2140 to insure proper alignment of the oil holes of the front oil seal ring liner with the oil holes of the blower case of applicable engines
	137	1-24-46	*Spark Advance Operating Unit Interference*	To give instructions for reworking the spark advance operating unit to prevent interference between the spark advance operating unit and the latest type ignition harness used on R-2000-9 engines
R-2800	78 Rev. 2	1-23-46	*Piston Ring Arrangement*	To give the proper piston ring arrangements on P&W engines to insure correct installation in service
R-2800	177 Rev. 2	1-22-46	*Intercylinder Oil Drain Hose—Shields and Clamps*	To incorporate new improved rocker drain manifold suction pipe clamps
	270	1-23-46	*Impeller Shaft Front Oil Seal Ring Liner Assembly Drift*	To give instructions for reworking PWA-2140 to insure proper alignment of the oil holes of the front oil seal ring liner with the oil holes of the blower case of applicable engines
	272	1-24-46	*Spark Advance Operating Unit Interference*	To give instructions for reworking the spark advance operating unit to prevent interference between the spark advance operating unit and the latest type ignition harness used on R-2000-9 engines
R-4360	17	12-29-45	*Throttle Balance Assembly, Stromberg PR-160 Carburetor—Instructions for the Usage of*	To advise activities in the field when the throttle balance assembly should be removed.
WRIGHT				
R-1820	334 Rev. 1	1-25-46	*Exhaust Valves—Inspection and Reconditioning of*	To provide recent instructions on the inspection and reconditioning of stellite and nichrome faced exhaust valves
	400	1-7-46	*Dowel Pins, Water Injection Control Unit—Installation of*	To eliminate the possibility of error during assembly of subject unit after overhaul of incorporating dowel pins in the different sections of the unit
R-2600	97 Rev. 1	1-25-46	*Exhaust Valves—Inspection and Reconditioning of*	To provide recent instructions on the inspection and reconditioning of stellite and nichrome faced exhaust valves
GENERAL ENGINE BULLETINS				
	7 Supp. 1	12-22-46	*Torque Limits for Tightening Nuts, Screws, Cap Screws, Studs, Bolts and Spark Plugs Used on Aircraft Engines*	To provide a new higher cylinder holddown capscrew torque for all R-1820 and R-2600 engine models
	8 Rev. 2	1-23-46	*Reclamation of Worn or Broken Engine and Accessory Parts*	To prescribe procedures for the reclamation of parts which are worn or broken beyond the point where repair by customary overhaul methods is impossible and to thereby avert stock shortages, or if shortages occur to permit early re-use of parts rejected on the overhaul production line
	12B	2-8-46	*Classification of Service Aircraft Engines*	To reclassify aircraft engines in order that naval aeronautical activities may have adequate information to determine the engine which is operated, overhauled, excess to the Navy Aeronautical Organization, to be salvaged or scrapped.
POWER PLANT ACCESSORY BULLETIN				
	0-46	2-8-46	*General, A-4*	To list effective and cancelled Power Plant Accessory Bulletins
HAMILTON STANDARD PROPELLER				
	38	1-18-46	*Service Publications Index—Hamilton Standard—Approval of*	Index to be used in connection with overhaul and maintenance or propeller on naval aircraft
	39	1-21-46	*Hamilton Standard Propeller Bulletin No. 102—Approval of*	To approve Hamilton Standard Propeller Bulletin No. 102
	40	1-23-46	*Torsional Vibration Absorber for Blade Drawing, 6353A—Installation of*	To permit the removal of the 1900-2050 RPM operating restriction on PB4Y-2/RY-3 aircraft R-1830-94 engines.

Bomb Rack on Rocket Launcher

CASU 66—An ordnance installation developed by this command makes it possible to attach Mk 47 miniature bomb racks to fighter planes by using launcher rails for SCAR rockets, attached to Mk 5 zero length launchers.

Weight of the installation is 50 pounds. A well-insulated electrical lead with suitable plug is connected to the bomb rack. The other end with a suitable plug is passed through the case ejection chute and connected with a gun solenoid lead to stick switch.

The installation was tested by Tactical Development Unit, Fleet Air West Coast, and found satisfactory. At no time were any unusual flight characteristics noticed or any vibration or buffeting experienced. The rack, though having a side motion, exhibited no tendency to tear loose at any time but after a period of many hours may loosen the rocket rail installation. Planes should be checked for this daily by the plane captain to be sure they are in operating condition.

BOMB RELEASE GEAR HOOKS ON SCAR RACK

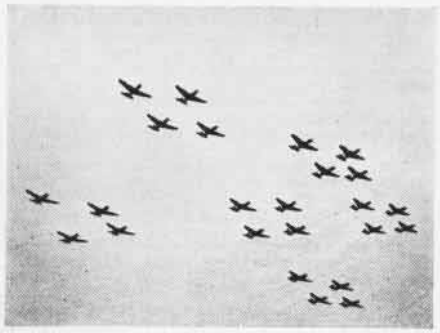
▶ ***BuAer Comment*—The only plane without bomb racks is the F8F. However, this plane has Mk 9 rocket launchers and adapting the Mk 47 to the Mk 9 should be tested if there is a requirement for it.**

LETTERS

SIRS:

If by chance you happened to pass the VB-11 line on 24 November, you would have been astounded by the fact that there were no planes on the line. The explanation is simple. They all were up on a formation hop—the deed involves more difficulty than the explanation.

Only by energetic efforts of our engineering department and the help of the CASU unit was this hop accomplished.



Overhauls and checks were completed in a minimum of time by the maximum of effort. Changes that ordinarily require 24 hours were done in 8 hours.

It is certainly an enviable record to scramble 24 SB2C's with 24 planes available. We are proud and thankful to both CASU and VB engineering for making this feat possible.

We seem to have neglected the pilots entirely. Well, the pilots carried on the policy by flying a very fine formation to the complete satisfaction of both the squadron skipper and air group commander.

D. H. STEGNER

VB-11, PACIFIC

SIRS:

In regard to the flight program being set up for discharged naval reserve aviators to maintain their flying proficiency in time of peace, will it be possible for discharged coast guard aviators to participate in said program?

If this is possible, will former Coast Guard aviators be able to transfer to the Naval Reserve with the same rank which they held in the Coast Guard, or will they continue retaining their present rank as an inactive in the Coast Guard reserve?

ROBERT K. O'CONNOR,
ENSIGN, U.S.C.G.R.

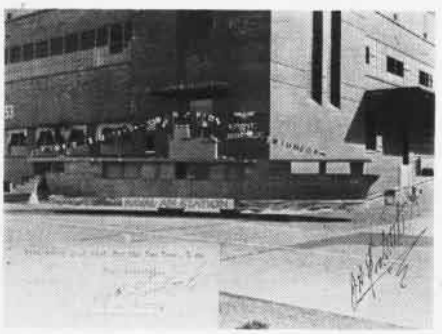
CGAS, ST. PETERSBURG, FLA.

¶ At this time there is no arrangement whereby separated aviators of the Coast Guard reserve can participate in the current voluntary flying being carried on under the Naval Air Reserve Program. Because of their interest, however, the matter is being taken up with the Commandant of the Coast Guard. Commanding Officers of Naval Reserve Air Stations will be notified of any decisions on the questions above and interested parties can find out from them. For a list of such stations, see Reserve Program article on page 23.

SIRS:

Pictured here is the model of the famous aircraft carrier *Hornet* which now reposes in front of a supply department warehouse as part of the "Inactivated Fleet."

During its heyday it was the float entry of the department in the Navy Day parade and later made a successful bond selling tour. It is modeled after the carrier from which General Doolittle launched his historic raid on Tokyo in early days of the war. As seen by the picture, General Doolittle put his stamp of approval on the jeep-powered *Baby Hornet*, which was designed and built by W. W. Powers of the Public Works Department.



PUBLIC INFORMATION OFFICER
NAS NORFOLK

SIRS:

The *Ranger*, upon completion of her overhaul period at the Navy Yard, Philadelphia on 14 January 1946, headed south for her new duty station via the Navy Base at Norfolk, Virginia. She arrived at NAS PENSACOLA on 22 January 1946 and reported to the Commander Naval Air Bases for carrier qualification duty as relief for the U.S.S. *Guadalcanal*.

Following a week of intensive preparation and numerous drills, she got underway early on the morning of 30 January for her first cruise with eight aircraft, SNJ-5C's and 30 pilots. Despite the fact that this was the first operation after a period of four months and that many trained men had been lost through demobilization everything proceeded smoothly and by mid-afternoon of 31 January the *Ranger* was back in port with all of her pilots qualified for carrier operations with 10 landings apiece to their credit.

Total landings on the *Ranger* to date are now 80,959.

D. P. JOHNSON,
CAPTAIN, USN
U.S.S. *Ranger*

The Cover: An Aerographer at NAS ALAMEDA prepares to make a balloon sounding to determine temperature, pressure and wind velocity for aerography's hourly report. The AerM3/c is K. M. Wright, later transferred to a Navy V-12 unit.

CONTENTS

ANSWERS TO QUIZZES

● BEST ANSWERS (p. 14)

1.C, 2.B, 3.B, 4.C, 5.B, 6.C.

● GRAMPAW'S SAFETY QUIZ (p. 8)

1. Low pitch for two position and variable pitch propellers, and take-off RPM for constant speed propellers. Ref: T.O. 39-41.
2. Whenever there is any possibility of icing. Ref: Flight Safety Bulletin 10-44.
3. Yes. In order to eliminate the risk of the bomb falling through the propeller. Ref: Flight Safety Bulletin 1-46.
4. Yes. Ref: BuAer Manual, Art. 6-110.
5. Yes. Ref: T.O. 42-43 and Art. 6-111 in BuAer Manual.

● T.O. & T.N. Quiz (p. 34)

1. 270 knots 2. 15,000 lbs. 3. TO 4-46 4. 350 knots I.A.S., TO 3-46 5. TO 103-45

● PIX QUIZ (Inside back cover)

1.6 2.6 3.3 4.5 5.2 6.2

● RECOGNITION QUIZ (Back cover)

1. Sunderland 2. A-26 3. BT2D 4. F8F 5. TB-7 6. PV-2 7. Vampire 8. SB2C 9. Meteor

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Test Yourself on Aircraft Power Plants

1 _____ 4 _____

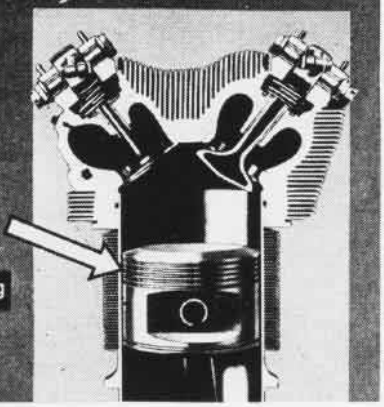
2 _____ 5 _____

3 _____ 6 _____

1

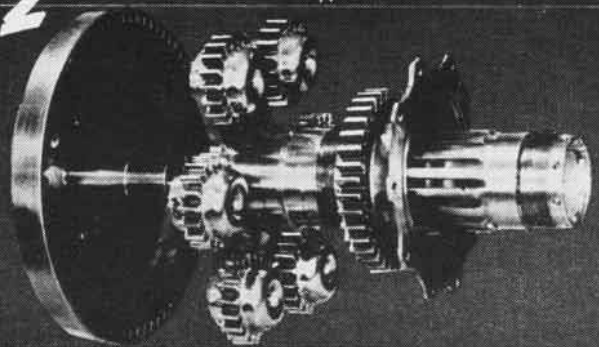
These rings facilitate:

1. Exhaust removal
2. Oil circulation
3. Piston installation
4. Gas expansion
5. Piston expansion
6. Conduction cooling



2

Here is a type of:

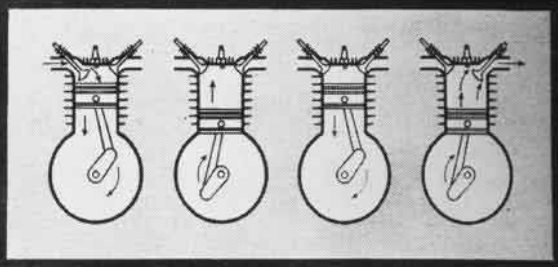


1. Gun control
2. Pitch control
3. Camshaft
4. Supercharger
5. Feathering control
6. Propeller reduction gear

3

Power-stroke principle illustrated here is:

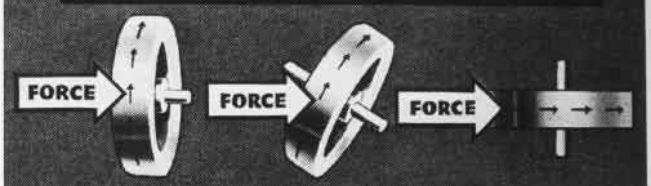
1. Multi-cycle
2. Variable-cycle
3. Four-stroke-cycle
4. Alternating-cycle
5. Double-cycle
6. Single-cycle



4

This illustrates the principle of:

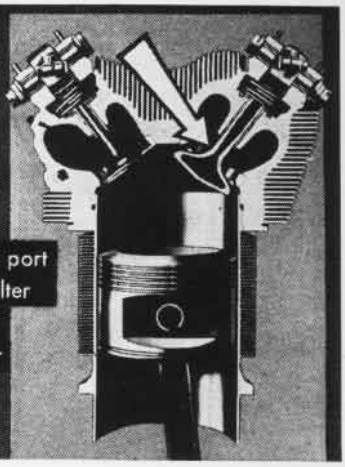
1. Transition
2. Deviation
3. Torque
4. Thrust
5. Precession
6. Hysteresis



5

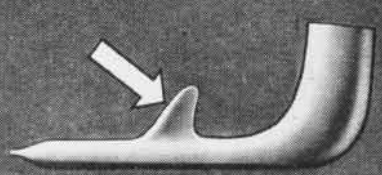
This type of valve is usually used in the:

1. Oil filter
2. Exhaust port
3. Intake port
4. Fuel filter
5. Mixture control
6. Expansion chamber



6

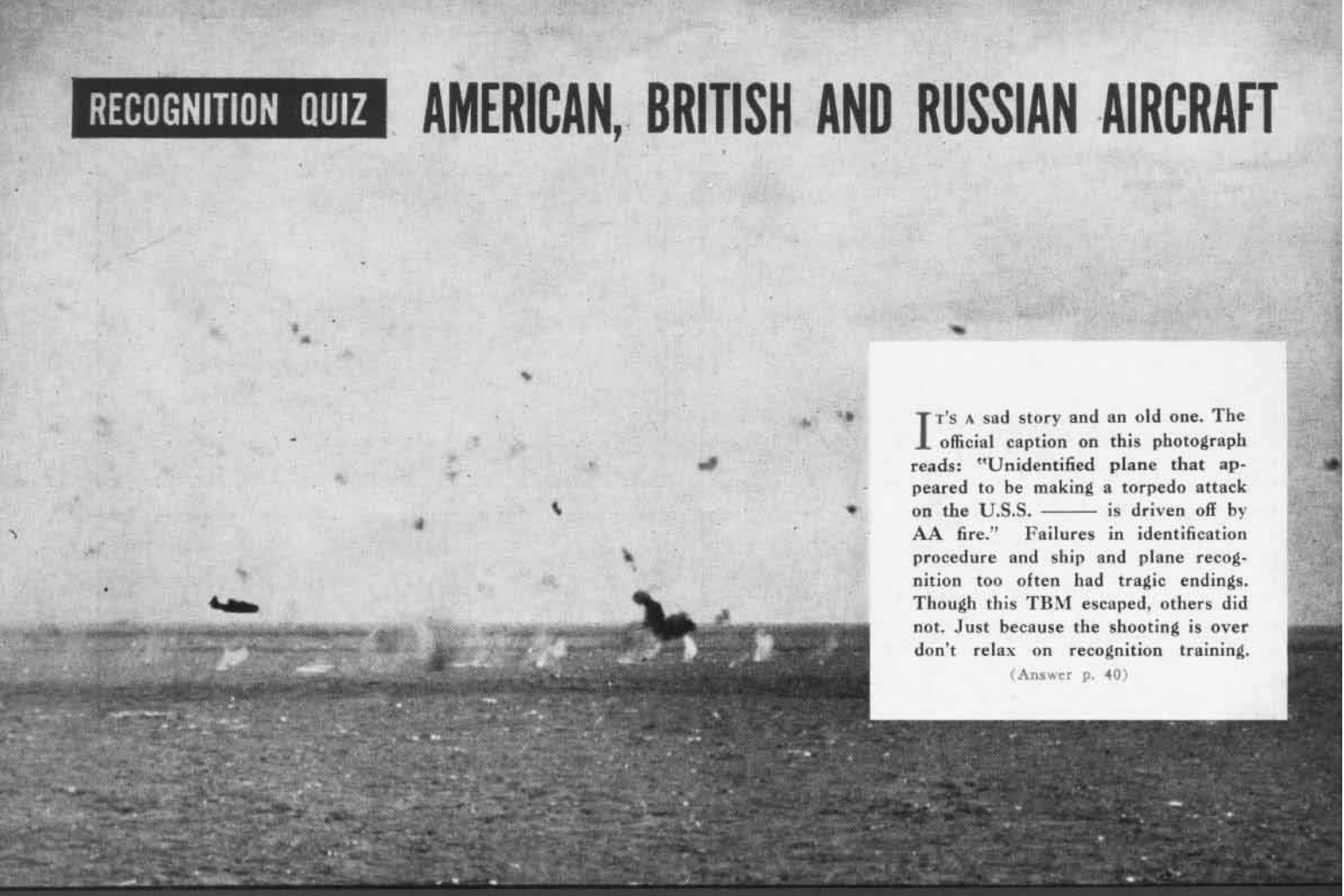
Arrow indicates the:



1. Pressure tube
2. Moisture trap
3. Heater
4. Valve
5. Static tube
6. Air scoop

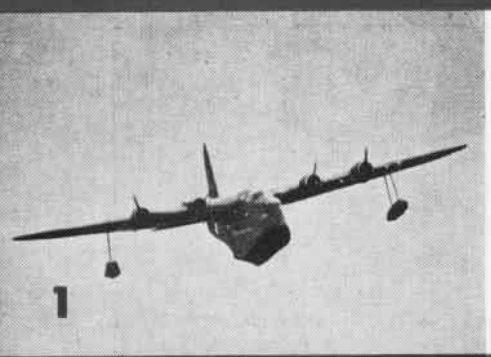
Answers on page 40.

RECOGNITION QUIZ AMERICAN, BRITISH AND RUSSIAN AIRCRAFT

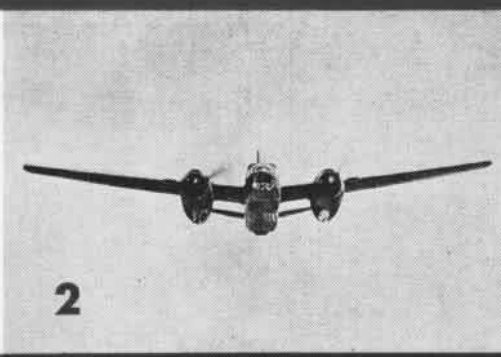


IT'S A sad story and an old one. The official caption on this photograph reads: "Unidentified plane that appeared to be making a torpedo attack on the U.S.S. ——— is driven off by AA fire." Failures in identification procedure and ship and plane recognition too often had tragic endings. Though this TBM escaped, others did not. Just because the shooting is over don't relax on recognition training.

(Answer p. 40)



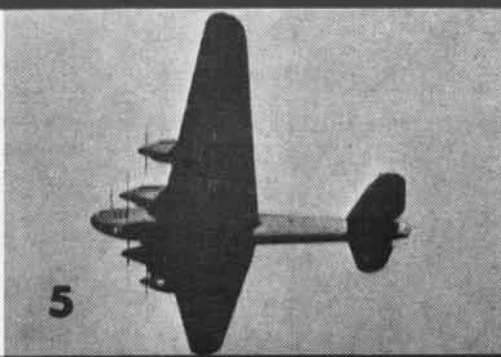
1



2

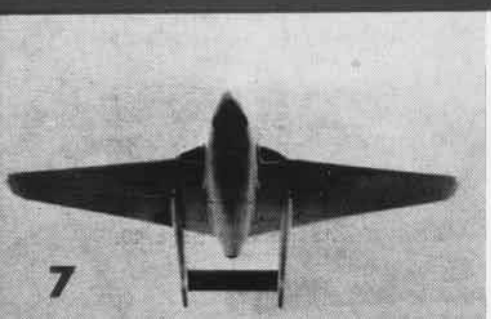
3

4

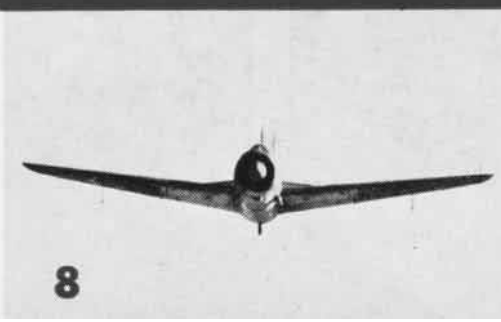


5

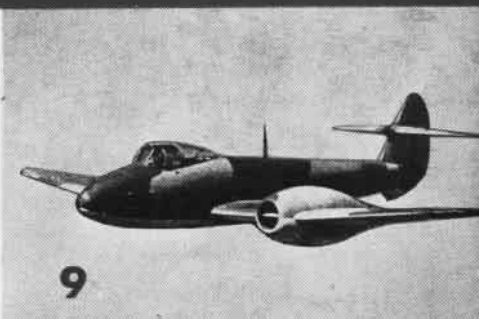
6



7



8



9