NAVAL AVIATION NEWS

Carrier Photo Recco
Cycloid Propellers

November 1946

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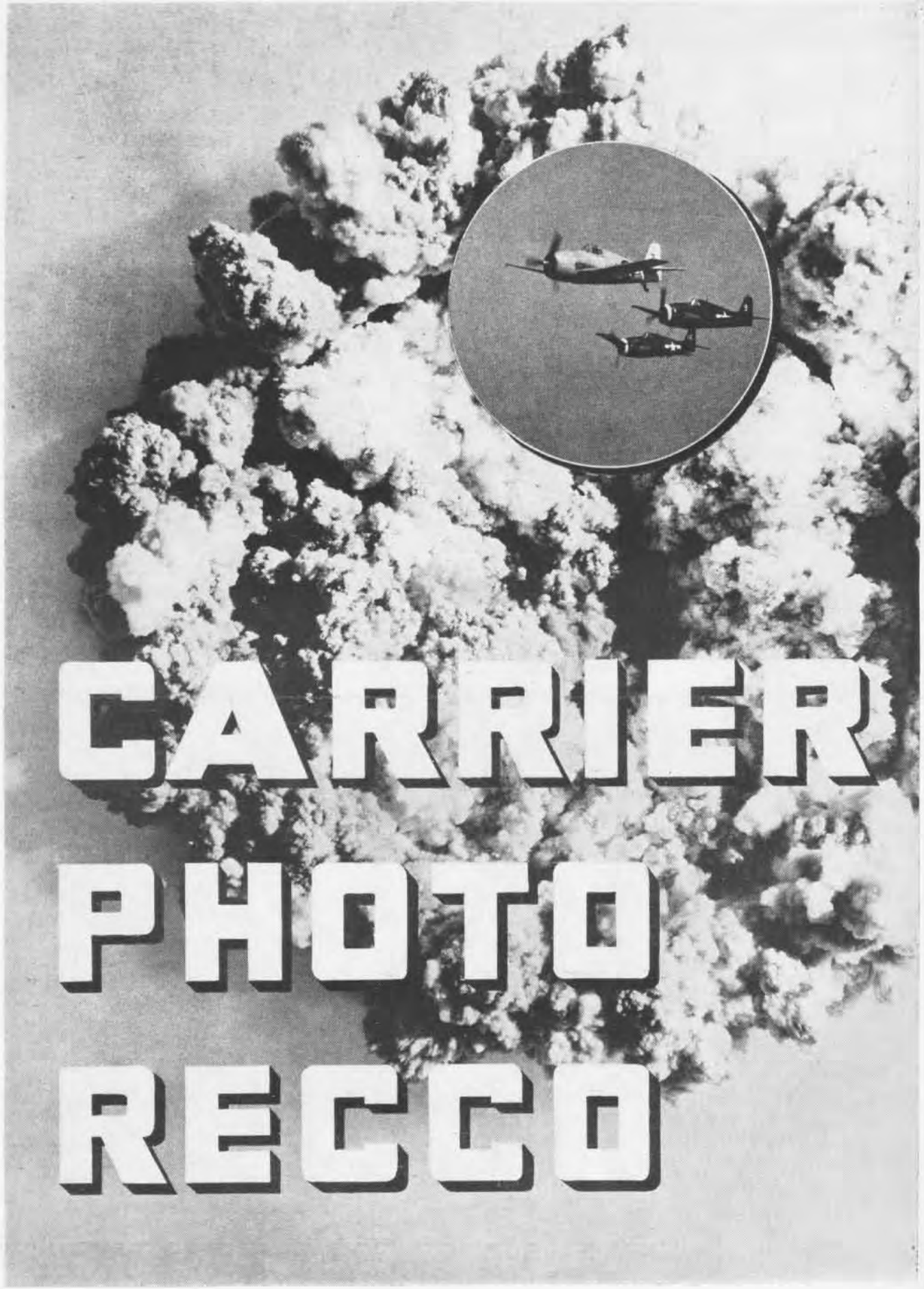

CARRIER
PHOTO
RECCO

SAIDOR'S AIRBORNE PHOTOGRAPHERS LISTEN INTENTLY AS THEY ARE BRIEFED ON THEIR VARIED OPERATION CROSSROADS MISSIONS

Navy's Flying Photographers Developed Carrier Reconnaissance into New Science

CARRIER photographers and technicians who made *Operations Crossroads* the most photographed event in history didn't come by their trade by accident.

When V-J Day arrived and the Navy's shutterbugs secured to their private darkrooms, they had made Japan the best photographed nation in the world. Special schools were turning out carrier photo pilots who got ringside seats at every major action.

At the outbreak of the war little was asked or expected of carriers in the way of photo reconnaissance. With the realization that 80-90% of all intelligence data is gained from aerial photographs by the use of overlapping stero pairs, the Navy took immediate steps to keep pace with modern photo requirements.

Ignoring more obvious fruits of battle in order to carry out routine photo hops is hard for new pilots. As soon as the bug bites them, however, they seem unable to see A/A bursts or tracers curling around their wingtips. The pictures they daringly took helped ACI officers assess damage and to direct returning strikes to hit the enemy where he most needed to be hit.

Although it is impossible for a carrier photo pilot to take a double exposure, he has many problems akin to those encountered by any embryo photographer. Many recco pilots wait until the last second to open their fuselage camera ports to avoid dirty camera lenses. One red-faced pilot, just returned from making runs at 800 feet over hostile Guam beaches, confessed to intelligence officers:

"I was really embarrassed to find my oblique camera hatches closed after my second run. The A/A was terrific and I had to go back in for a third run over the same damn area."

Photo reconnaissance students at Whiting Field photography school learn fundamentals of aerial photography before taking to the air

Enlisted technicians ready cameras for student recco hop; without specialists, carrier photography could not maintain high standard

Students plan division mapping hop calling for overlapping flight lines; camera port for oblique shots can be seen under plane wing

Special Training Given Photo Pilots Paid Off for First Time in the Africa Invasion

A FEW HUNDRED miles off Okinawa, the Fifth Fleet awaited the sunrise to begin launching strikes. The blacked out ships were cruising on calm waters, but inside one carrier all was not so serene.

The flight officer was catching hell from pilots, who asked: "We came out here to fight a war. How come we have to escort photo planes?"

Even the flight officer couldn't answer that one. All he knew was that the flight schedule called for whole divisions of photo planes and strong escorts. Someone evidently wanted pictures and wanted them badly.

Although photo coverage was the primary mission of the Fifth Fleet's visit to Okinawa during the first days of March 1944, it couldn't be told. Only a few of the photo reconnaissance teams knew that their pictures were vitally needed for the coming invasion of Okinawa.

The men who planned invasions back at Guam and Pearl Harbor needed Sonne strip pictures of the beaches. These continuous strip pictures, taken at low altitude by a special camera, could reveal the depth of water over the reefs. The planners had to know where heavy artillery could get ashore and where infantrymen might wade ashore.

They needed vertical and oblique photos to find out what was back of the beaches—gun emplacements, caves and other anti-invasion defenses. Pre-invasion bombarding forces needed up-to-date maps to clear the way for the Marines.

Every strike approaching the island after sun up brought in at least one division of photo reconnaissance pilots in *Hellcats*. Back of the armor plate in each plane rode cameras in special mounts which allowed them to make verticals or obliques through ports in the fuselage.

Just 26 days before the landings were scheduled to take place, the photographic interpretation officers at Guam received the rolls of film taken over the Okinawa beaches.

Photo reconnaissance from carriers hasn't always been so precise, however. Prior to the 1940's, carrier-based photography was haphazard in its planning and application. There was no accepted VF camera installation.

By the middle of 1940 pilots were receiving six weeks of training under ComAirLant in F3F-3P's. In 1941 a similar Pacific Fleet Air Photographic Unit was set up at San Diego.

This special training for carrier photo pilots paid off for the first time in the invasion of Africa. Planes operating from one of our large carriers cooperated with Army recco planes to discover cleverly camouflaged German aircraft.

AS THE carrier offensive gathered momentum in late 1943 and early 1944 the Navy rushed the training of aircrewmen in photography. Task group commanders soon suggested that all carrier air groups have a fighter plane equipped to carry out photo missions. All VF camera installations up to that time had been local jury rig affairs.

In April 1944 their prayers were answered; San Diego A&R change No. 113 was issued to accommodate various aerial camera installations. By this time photography training schools were going full blast at Norfolk, San Diego, Harrisburg and Barber's Point. Thus the stage was set for carrier-photo reconnaissance to become an important part of naval aviation.

The idea of having all their bomb drops recorded by the all-seeing eye of a vertical or oblique aerial camera was not too popular with pilots at first. Many pilots had to revise estimates of damage when prints were rushed from labs.

Two specially trained VF-1 pilots aboard the *Yorktown* were among the first to serve with the Pacific Fleet. They soon found the two photo VF not enough for a CV. By the middle of 1945 each Fast Carrier Task Group Commander was assigned a Photo Recco Unit. Each consisted of six specially trained VF pilots, two photographer's mates and four photographic F6F(P)'s.

Although often lacking the immediate thrills of other combat hops, photo-reconnaissance flying takes as much or more precision on the part of the pilot. Cameras and lenses must not be tilted more than three degrees from the vertical - precluding banking or steep turns to avoid A/A.

On low altitude oblique beach runs, pilots must hold their prescribed altitude within 10 feet—a feat which even the best aviators find difficult under ideal circumstances.

THE TWO principal uses of carrier photographs are *(1.)* the immediate operational intelligence data that can be gained from aerial photos for use by succeeding carrier strikes, and *(2.)* the overall strategic intelligence data that is of value to ground troops and planning agencies.

Pilots aspiring to careers as carrier photo recco pilots today get the word on the latest methods at the USN School of Photographic Reconnaissance at Pensacola. Established at Whiting Field under Chief Naval Air Advanced Training, Jacksonville, this post-war establishment replaces like schools in the various fleet commands.

Students will go through the basic school in photography, the same as is given enlisted men, before going on to aerial camera studies in combat aircraft.

Following are the different types of aerial photographic missions given students of carrier photo recco:

Verticals—Aerial photos made by shooting straight down. They possess much detail, accuracy, can be made over inaccessible areas and can be speedily made into mosaic maps. Pilots must predetermine exact ground speed, intervalometer setting and altitude required to give the desired 60% overlap in a series of verticals. This line of flight overlap is often used on targets for single reconnaissance strips so that intelligence can use stereoscopes for three-dimensional views.

Pinpointing—A vertical photograph in which the principal point of interest is located at the center of the photo.

Mosaic—(multiple strip mapping) A series of two or more single vertical strips which overlap by 40-50%. This side overlap, necessary for accurate maps, is often accomplished by divisions flying as teams.

Obliques—These are made by tilting the camera from the vertical. There are "high" and "low" obliques which are used in conjunction with verticals for intelligence purposes.

Trimetrogon—Three cameras overlap each other so that a photographic strip is made from horizon to horizon. This installation, utilizing one vertical and two oblique cameras, maps large areas with a minimum of time and effort.

Dicing—Oblique photos from as low an altitude as possible. Using a K-25 camera, VF can also shoot astern. Originating in RAF, dicing gets under low-hanging camouflage.

One of the outstanding developments of the war was the Sonne camera for water depth determination. Developed by the Navy Photo Science Laboratory and the Photo Intelligence Center in Washington, the camera uses two lenses, one tilted aft and one forward. Thus the camera can take large-scale stereo pairs on a continuous strip. A stereo comparator measures the distance between the surface of the water and the bottom. Average camera error is six inches.

Large scale photos, taken at altitudes of 100-300 feet over Okinawa provided ground support information that was not available by any other photographic means. The camera can take photographs at air speeds even greater than 1000 mph.

Off on their first photo mission, pilots come face to face with an intricate check-off list, learn the necessity for precision flying

Back on the ground, labs use latest methods to turn out the films in record time; during war wet prints were rushed to intelligence

Instructor points out errors in mosaic taken by student division; Stereoscope viewer is visible on left, single recco strip at right

Saidor photo pilots devised method of obtaining target array maps, kept varied pictorial record of big show from their ringside seats

Careful planning put maximum number of photo planes over the atom blasts where carrier pilots utilized techniques learned in war

Saidor, Converted into Photography Lab, Was Headquarters for Crossroads Pilots

CARRIER photo pilots helped make *Operation Crossroads* the most photographed event of all time. Carrier reconnaissance, through the precision of its photo pilots, the know-how of its technicians and the perfection of its photo equipment, had a major part in making it so.

Crossroads photographic operational headquarters was the escort carrier *Saidor* (CVE 117). Specially rigged for the operation, she was at one and the same time an operational flattop for photo planes, a floating lab for film processing and a houseboat hotel for Bikini-based photographers.

Topside the *Saidor*, except for an occasional helicopter hovering above her flight deck, looked like any other late model CVE. On the hangar deck her three-sided photographic mission was immediately apparent. Crates of photo gear piled halfway to the overhead amidships.

On the starboard side stood four large refrigerators for storing perishable photo supplies. The converted starboard ready room served as processing laboratory and the port ready room as photographic administration office.

At Bikini the *Saidor's* flight deck carried *Hellcats* modified into F6F-5P's, *Avengers* specially adapted for photo use, four TBM's from the *Shangri-la* that on Able and Baker days controlled the radiological drone, boats, two Grumman *Ducks* and four helicopters.

For the *Saidor* and its photographic personnel, organizational work began in March with the delivery of seven *Hellcats* and five TBM-3E's. This was at Pearl Harbor. Turret assemblies were removed from the TBM's and A&R installed platforms for motion picture photographers.

With the photoplanes came photo pilots, carefully selected from Crossroads volunteers. Few of these men had had previous carrier photo pilot duty.

Training started immediately. While still in Hawaii the men selected to fly the Navy's carrier-based photo planes over Bikini got their initial taste of flying vertical strip maps and pin pointing targets. There they made multiple flight line mosaics, practiced formation coverage of areas and learned about flying Sonne strip runs over Oahu beaches.

Something new to carrier photo pilots was this movie camera rigged to bomb rack of F6F; drones carried remote control equipment

Technician loads magazine of K-17 vertical camera; *Hellcat* mount also holds two oblique cameras for shooting out of fuselage ports

When the *Saidor* shoved off from San Diego to pick up supplies and technical crews, the photo pilots and their planes came along. Flight lines resembling Bikini lagoon in size and shape were laid out over San Diego bay and all hands began concentrating on the *Crossroads* "op plan."

Senior officers carefully checked the work of individual pilots to determine which men did what types of photographic flying best. On the basis of this screening, pilots were assigned to those fields of aerial photography in which they were most proficient.

After reaching Bikini, it took just one operational flight to convince all hands that changes were necessary in the *Crossroads* plans for photo recco. In the original plan two *Hellcats*, using K-17 12" and 6" cameras were to fly a total of 14 flight lines. This required 30 minutes.

In that time target ships could, and did, swing up to 30 degrees. Laying down a mosaic map of the fleet under those conditions was impossible. The *Saidor's* installation section quickly came up with a new plan calling for four rather than two *Hellcats* and a pair of K-18 24" cameras.

Doubling the number of planes and increasing camera sizes reduced flight lines required from fourteen to four.

THE PHOTO pilots themselves developed the method for flying the target array maps. The four *Hellcats* approached the flight line at 90° from course in a right or left echelon. After passing two miles beyond the flight lines, the planes broke off away from the target at eight or 14 second intervals, depending on altitude, in a 30° bank 180° turn. The maneuver sets up the planes with approximately a correct interval between flight lines in a tail chase formation. In practice the turn was nearly in unison and the four *Hellcats* roared across the target ships abreast.

The mission of the *Saidor's* photo pilots at Bikini was fivefold. First they were charged with the responsibility for vertical coverage of the target fleet. Exact positions of each target vessel had to be determined immediately prior to each detonation.

Secondly the photo pilots made trimetrogon coverages of the target array to determine ship positions, utilizing images obtained from land control points in oblique photographs to tie in the pictures obtained with the vertical camera.

The third part of their mission included vertical stereo coverage of the lagoon side of Bikini island with the Sonne strip camera to obtain detailed analysis of the bottom area from the shore line out to an approximate depth of 20 feet. This photo coverage proved to be extremely valuable in evaluating wave motion and damage caused by explosions.

Extremely good still and motion pictures were taken from modified turrets of *Saidor's Avengers;* special crutch held F-56 20" camera

Their fourth mission included making oblique photographs of the target array, the blast and blast phenomena for public information. The fifth and final part of the photo pilots' mission was motion picture coverage.

The Sonne cameras proved highly valuable in damage assessment work. From this color film it was possible to accurately assess damage on certain ships long before boarding parties could safely go aboard.

This was particularly true in the Baker test where radio activity was so strong that boarding parties were kept off certain target ships for many days. Where hatches were left uncovered or knocked off, the stereo film photographed damage even inside the holds of target ships.

When its carrier type photo planes were immobilized during periods at anchor inside the lagoon, the *Saidor* relied on the two Grumman *Ducks* and its four helicopters for special rush job aerial photographic assignments. Immediately after Baker day five helicopter flights were made to remove film from islands bordering the radio active Bikini lagoon.

Huge complement of photo personnel, technicians was needed since *Saidor* was literally floating photo laboratory for Bikini Test

Round the clock schedule of film processing required this mountain of equipment, leaving little room for photo planes in hangar deck

GRAMPAW PETTIBONE

Borrowed Time

The first two planes of a three plane FAM flight took off in formation, followed closely by the number three man.

At an altitude of 150 feet and just beyond the end of the runway, the number two plane started a cross-under to a position on the left of the division leader. The number three plane had fallen slightly below and behind the first two planes, and this pilot also started a cross-under to the left and added throttle to close in. As he pulled up into position he felt the propeller of the number two plane chewing into the rear control surfaces of his plane.

Fortunately after the stick was knocked out of his hand, he was able to regain control of the plane and he was able to climb ahead to an altitude where he could bail out over water. The division leader observed that the right elevator and most of the horizontal stabilizer on the number three plane were missing and the left elevator was chewed and partly gone. When the pilot slowed the damaged plane to 115 knots with 10° flaps down, preparatory to bailing out, it began to dive and zoom violently. What was left of the elevator was flapping up and down.

Just as he started to leave the plane, it nosed down sharply and half-rolled to the right. He was pinned against the fuselage for a minute and then thrown clear. He was picked up by a fishing boat after a few minutes in the water. Meanwhile the pilot of the other plane had effected a safe forced landing back at the field although his plane was vibrating so badly that his hand was injured in holding the stick.

Grampaw Pettibone Says:

Some people really work their guardian angels overtime. Cross-unders at an altitude of 150 feet are bad enough, but when they are made without a positive signal from the division leader and when two pilots each think they are supposed to occupy the same spot in the formation—that *always* spells TROUBLE. You fellows are living on borrowed time. . . . I hope you make good use of it. Why don't you form a "Society for the Prevention of Simultaneous Unsignaled Low Altitude Cross-unders"?

NO DOUBT you have wondered what *Dilbert* and *Spoiler* have been doing since the war ended. Unfortunately we can't give you a very favorable report—at least not on *Dilbert*. For just a few weeks ago he turned up at Atlantic City to give the bathers a free thrill—free for them but pretty costly for the Navy.

Dilbert had a plane from a nearby Reserve Base and thought that it would be fun to put on an air show for the folks on the beach—just a little low altitude acrobatics and a bit of inverted flight. His engine started missing but this didn't deter *Dilbert*. The show must go on! Besides he remembered from somewhere that "this was a characteristic of the plane when inverted." When his engine quit altogether, he tried to glide to the nearest airport which was several miles away. However, he had very little altitude and didn't make it. The life guards swam out and pulled him in.

He is shown above explaining his actions to a Naval Aviators Disposition Board.

GRAMPAW'S SAFETY QUIZ

1. **If you call in for an altimeter setting and reset your altimeter before landing, will it read zero when you land?**
2. **Is smoking permitted in Navy combat-type airplanes?**
3. **When is the application of brakes of greatest value in preventing a ground loop?**
4. **What restrictions govern the use of full combat power during authorized gunnery practice in first line service aircraft with combat power equipment installed?**
5. **Combat-power-equipped engines may be permitted to accumulate (*a.* 12 minutes), (*b.* 2 hours), (*c.* 8 hours), (*d.* 24 hours) of full combat power time between overhauls.**

(Answers on Page 40)

Parachute Ten Commandments

Proper care and handling of parachutes is essential to assure maximum efficiency for this important class of equipment before the emergency arises. An Army flight officer who abused his parachute and who was required to write an essay on the proper care of the parachute is responsible for the following *Ten Commandments:*

I

Thou shalt not suffer thy parachute to become wet, moist, damp, watery, undried, humid, dank, dewy, juicy, saturated, soggy, muddy, dripping, soaking, oily, greasy, sloppy, sodden or otherwise contaminated.

II

Thou shalt not covet thy neighbor's parachute.

III

Thou shalt not forget to carry adequate parachute harness to the aircraft, neither shalt thou forget to carry sufficient parachutes for all officers, enlisted men, enlisted women, civilians, or animals.

Pax Vobiscum
Ensign Doakes:
We know you'll miss
The rum and cokes.

IV

Thou shalt wear the parachute at all times when flying, soaring, floating, and when not in contact with the ground.

V

Thou shalt not abuse, maltreat, ill-use, scratch, maul, sit on, stand on, walk on, overtax, throw, pitch, toss, heave, slam, bang, jab, pelt, pick, cut, pierce, or otherwise mistreat thy parachute.

VI

Thou shalt always inspect, ogle, goggle, look askance, peck, peep, peer, and pry at thy parachute to insure its being in good condition before checking it out of the parachute room.

VII

Thou shalt talk to no one who asks to borrow thy parachute for any reason whatsoever.

VIII

Thou shalt watch thy parachute in a military manner, keeping always on the alert for any inadequacy, "caput mortuum," disservice, rip, tear, faulty, loose, careless, slovenly, or otherwise unsatisfactory repack, neither shalt thou forget to respond promptly to bail-out signals when given while flying.

IX

Thou shalt not carry, hold, pick up, lift, fetch, transport, shift, bring, reach, or pass thy parachute by the metal ripcord handle, but shall always, eternally, forever, at all times and without fail, use the fabric strap that is provided solely for this purpose.

X

Thou shalt be especially watchful at night and during the time of flying and challenge anyone who flirts with, attempts to make free with, looks covetously at, or takes liberties with, thy parachute or thy neighbor's parachute and to quit thy parachute only after making contact with terra firma, terra cotta, macadam, Mother Earth, Father Neptune, dirt, sand, clay, gravel, or vegetation of any kind.

Fell Into a Grave!

An N5C had landed at a Chinese airport and unloaded its cargo. While taxiing out to the take-off position, the runway caved in under the right wheel. Inspection disclosed that the wheel was sinking into an old Chinese tomb. The airstrip was a Japanese-built asphalt strip currently used by the Chinese Air Force.

Four life rafts were placed under the right wing and inflated to take the strain off its wing tip, aileron and main spar. This prompt action minimized the damage.

Grampaw Pettibone Says:

That's what I call using the old noggin. It's not everybody that can fall into a grave and come out smelling like a rose.

Passengers Wouldn't Jump

Two passengers and a crew member were killed in forced landing of the SNB pictured below. The pilot and one passenger survived, but were seriously injured. The order to "Bail Out" was first given at about 2,000 feet, but the passengers did not have their chute harnesses on and there was considerable confusion and time lost while they got into harnesses and buckled on their chutes.

The pilot was experiencing great difficulty in controlling the airplane due to its extreme vibration. He was helped into his harness by a crew member and states that he was ready to jump but none of the passengers had left the plane. He shouted again for them to jump and started looking for a possible landing spot in the rough terrain below. The area was hilly and wooded, with occasional clear areas.

Since the passengers did not jump, the pilot selected what he thought was the best available landing space and attempted a forced landing. Both engines were shut off in hopes of reducing the vibration which was so severe that the pilot thought an engine or wing might come off. The area selected for the forced landing was undershot and the pilot found himself heading for a fairly steep hill.

He dove the plane to pick up 100 knots and tried to hold off so that the plane would hit at about the same angle as the slope and slide up the hill. However, when he tried to pull the nose up enough to match the angle of the incline, the aircraft stalled from about 15 feet and nosed down. The deceleration tore all the seats in the passenger compartment completely loose, throwing the passengers forward.

A careful inspection is under way to determine the cause of the extreme vibration which occurred after about two hours of normal flight. Preliminary investigation indicates that the vibration may have been due to structural failure within the starboard engine which was trailing smoke at the time of the forced landing.

Grampaw Pettibone Says:

This is the sort of accident that makes me mad all over. A pilot who is busy trying to control an aircraft under these circumstances can't leave the pilot's compartment and pass out written invitations to jump. However, if the pilot had carefully instructed the crew and passengers before take-off to wear their harnesses, the confusion which ensued when the bail-out order was given would have been lessened and more time would have been available to abandon the plane.

As things stood, the pilot found himself in a tough spot. When the passengers did not jump, he had to land the plane under very unfavorable circumstances.

Get Down or Get Out

Two fatal accidents have occurred recently in the course of emergency landings due to fire. In both instances the pilots apparently did not realize the seriousness of the situation. One pilot flew past two suitable landing areas in an attempt to get into his home field, and the other made a complete circle of an army field with his plane on fire. Both spun in from low altitudes when the fire became very intense.

Grampaw Pettibone Says:

When an airplane is on fire, there are just two things to do—either land it *at once* or *get out*. Personally I think the second choice is the best, provided the airplane is not likely to fall into a populated area.

Here's another thought to bear in mind. If you are making an emergency landing with a serious fire condition, be wary about lowering your wheels, even if you are going to make the runway all right. You'll get out faster if you bring it in on the belly, and in many planes the lowering of the wheels creates drafts of air through the plane which increase the fire and tend to bring it into the cockpit.

Hurried Exit!

The three action shots above were caught by an alert photographer who was stationed near the end of the runway when the F4U crash took place.

In this case the pilot banked sharply at low altitude to get lined up with the runway. The aircraft stalled in this turn and struck the end of the runway on the left wing tip. For a brief moment it slid directly towards the photographer, but as soon as it changed direction he began shooting pictures.

Grampaw Pettibone Says:

I don't blame you at all for the haste with which you are leaving the plane, but I hope that next time you will take a voluntary waveoff when you overshoot the wind line. Remember—a lot of pilots get killed every year wrapping their planes up in tight low altitude turns in order to get lined up with the runway.

Rainmakers—Front and Center

Recently, two CFR flights were erroneously cleared. One clearance had no weather on it while the other had the weather of an alternate field. At the time of the flight clearances, the point of destination was under instrument conditions. Fortunately these aircraft were landed safely at the point of destination but under a 500-foot overcast with intermittent snow.

Grampaw Pettibone says:

Yep, this is the type of discrepancy that often has led to disaster. These two cases are cited to represent an example of the manner in which weather accidents are born. In the interests of aviation safety all pilots and operations officers must comply with Aviation Circular Letter No. 26-44 and Flight Safety Bulletin No. 17-45.

SKIPPER, EXEC OF NARTU, ST. LOUIS, WELCOME ABOARD GROUP OF VETERANS FOR DUTY

Reserve Flying Highlighted V-J Day Celebrations Across Nation

AUGUST 15 1946 . . . V-J Day plus one year.

A peacetime, part-time Naval Air Reserve organization whose members' full-time, wartime works had made possible this day put on a show for the nation that was loaded with grandeur.

And what a show! Naval Reserve fighter planes, bombers, and scout observation aircraft shadowed the country's Main Streets and fair grounds and picnic parks.

It was quite a day for celebration—and retrospect on such things as the might of Naval Aviation. For the layman, at least, it was.

For the Naval Air Reservist, however, it was time not only for retrospect—but for prospect. And, resultingly, plans for the future took precedence over historical matters.

The Reserves' current drive for additional stationkeeper personnel got a boost from the V-J publicity, and the very day the pilots put on their shows across the continent, notices appearing in the want-ad sections of newspapers in large cities further spurred recruiting.

Results from the classified advertisements were quick and helped a great deal in solving the personnel problem of the Navy's reserve bases. Enlistments will continue indefinitely, for there is a long row to hoe before the complement of enlisted specialists and seamen is filled.

Enlisted problems weren't the only ones that Reserve units faced in relation to personnel. Some of the more-distant-from-large-cities stations such as Willow Grove are finding great difficulties in filling their officer complement.

It's not that there aren't officers around—it's just that they are too senior. Fifty-five billets are open in the Organized unit at Willow Grove, yet over 200 applicants must remain on volunteer basis because they all have ranks senior to the desired billets.

The answer?—Oh yes, as we said, it's quite a problem, isn't it?

Reports from the various Reserve units varied a good deal this month as the flying took on a more organized appearance. Some of them are:

● NARTU MINNEAPOLIS—Shell Lake, Wisconsin, was the scene of an air/sea rescue mission performed by Reserves in a PBY, and the performance of the fliers and the Catalina stole the show away from other attractions at Shell Lake's new airport dedication. A repeat performance with the PBY was made at Stevens Point, Wisconsin, later when a veterans' homecoming was staged.

● NAS FLOYD BENNETT—The editor of the station newspaper, *Skyscrapers*, went into the editorial section of his paper to denounce the underplay—or foul play as it were—that Manhattan newspapers had given the moving of Navy aviation units to the bayside of NAS.

It seems that the metropolitan editors had the idea that "the Navy had begun to evacuate" Floyd Bennett for the convenience of private flying and that only a small transport unit and Coast Guard activity would remain.

Our wrongfully injured editor was quick to note that the statement of demise of the Navy's previously intense flying program at Floyd Bennett was far from right and deplored the public fourth estate's oversight of the Reserve component at NAS which makes it—more than any other activity there—a major Naval Air Base on the east coast.

● NAS MEMPHIS—Pilots of the unit participated in three air shows at Conway and Newport, Ark., and Tupelo, Miss., winning some excellent Reserve publicity.

● NARTU SAN DIEGO—In order to have all reserve pilots flying as much as possible they are being given printed matter for their off-station consumption. Week-ends don't include time for reading, so pilots' hand-books, squadron orders and notes, tech orders and notes, and flight safety bulletins applicable to plane type are issued each pilot for home reading.

In the progress of week-end flying, San Diego's reserve pilots are being given check-outs in radar landings with the set now available at MCAS, Miramar (Camp Kearney).

● NAS OAKLAND—The NARTU for this locality recently moved here from NAS, Livermore, when that base was deactivated. First organized squadron meeting dates were September 14, 15.

● NAS JACKSONVILLE—A hangar and a separate administration building has been set aside by Advanced Command for the Reserves who moved here from Cecil Field.

TRANSPORTATION FOR INTERESTED, PROSPECTIVE STATIONKEEPERS IS GOV'T FURNISHED

ACADEMY GRADS STUDY NAVAL AIR POWER

MEMBERS of the graduating Academy class of 1947 received an introduction to the science of naval aviation in an additional month's training at NAS JACKSONVILLE, and aboard the aircraft carrier *Ranger*.

The Florida training is similar in most details to the current Annapolis summer air indoctrination course. (NA-NEWS, Sept.) Acquisition of a full-fledged military airfield at the Academy, recently approved by the Senate Naval Affairs Committee, would eliminate much of the Jacksonville training.

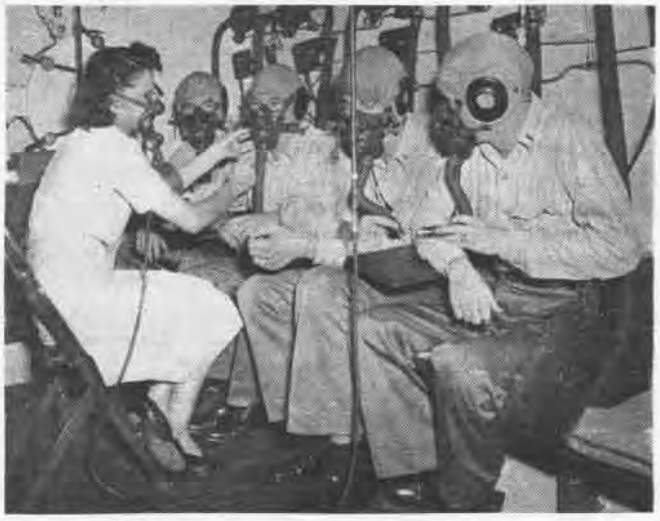
The new aviation department at the Academy will acquaint all future midshipmen with the fundamentals of naval aviation before graduation.

A total flight time of 10 hours per student is logged during the Jasksonville training program. Half of the graduates attended the course in June and the other half attended in July.

In flights from NAS JACKSONVILLE and instruction aboard the *Ranger* the new ensigns were checked out in every phase of naval aviation. By the time they report to their first duty stations, they will have a well-rounded concept of naval air power and will be able to decide whether, in one or two years, they wish to specialize and win wings.

DESIGN OF P-80AT HULL GETS GRADS' ATTENTION ON JAX RAMP

FUTURE ADMIRALS STUDY INTRICATE ART OF SPOTTING AIRCRAFT



AIR, GROUND CLASSES TEACH EVERY PHASE OF NAVAL AVIATION

▼ RANGER LSO GIVES OFFICERS LOWDOWN ON CARRIER LANDINGS

▼ INSTRUCTOR SHOWS WARTIME STRATEGY IN RANGER'S CIC ROOM

AIRCRAFT PREVIEW

A ROUND-UP of the Navy's latest innovations in various types of aircraft includes two new jet fighters, the XFJ-1 and XF6-1; an amphibious utility plane, XJL-1; a large twin-engine helicopter, XHJD-1; and a primary trainer, XNQ-1.

A preview of the future was given to Naval personnel when the McDonnell *Phantom* XFD-1 successfully completed its carrier trials aboard the U.S.S. *Franklin D. Roosevelt* last July. This was the initial flight of a pure jet airplane from an American carrier. It was not just an isolated trial or stunt, however; it was an accurate indication of the things to come.

Following closely behind the *Phantom* series are two new, high performance jet fighter aircraft, the Vought XF6U-1 and the North American XFJ-1. Currently both of these airplanes are undergoing preliminary evaluation and demonstration. They give promise of being excellent prototypes for future production aircraft.

The XFJ, built by North American, is powered by a single General Electric TG-180 axial-flow turbojet engine. Its stubby, yet streamlined, fuselage gives a very belligerent appearance. The air intake is located in the nose of the airplane, though the engine itself is located abaft the pilot and exhausts at the rearmost end of the fuselage, abaft and below the empennage. Despite its weight of 12,000 pounds, this airplane will travel at speeds far in excess of 500 miles an hour. Its exceptional rate of climb puts it in the "mile-a-minute" class.

In plan form, the Vought XF6U-1 bears a marked resemblance to the XFJ, though slightly smaller and lighter. In side view, however, the two planes may easily be distinguished from one another. The Vought airplane has its intake ducts located in the leading edge of the wing roots and has the jet exhaust at the bottom of the fuselage, approximately five feet forward of the rear of the airplane, making it look somewhat like a torpedo bomber.

This type of intake and exhaust eliminated much ducting which would otherwise be required, thereby decreasing aircraft weight. A single Westinghouse axial-flow 24C turbojet provides the power to fly this airplane at speeds slightly in excess of those obtained by the XFJ. Again the rate of climb puts this plane in a "mile-a-minute" category.

Although both airplanes are flying now, it will be many months before squadrons become operational with the fleet. Many problems arise in the design of conventional aircraft, and these problems are multiplied in jet planes. Fuel consumption for a jet engine is higher than that of a reciprocating engine, especially at low speeds and altitudes; though for short ranges this is offset by the fact that a jet engine installation weighs considerably less than a conventional en-

Jet exhaust on XF6U-1 is at bottom of fuselage about five feet from rear of plane. Speed somewhat exceeds that of the Phantom

gine developing the same thrust horsepower. Further problems associated with Navy carrier types are take-off, landing, rendezvous, and deck handling.

The take-off stall speed is necessarily limited by catapult and speed limitations. Difficulty in landing was expected also, since there is little spread between power-on and power-off stalls. In propeller-driven aircraft the power-on stall speed is usually 5 to 15 miles per hour less than power-off stall speed, largely because of propeller wash effects. This enables a pilot approaching the carrier at approximately power-off stall speed to drop immediately after cutting the gun. Since such a spread is not inherent in jet aircraft, there is a tendency for a jet airplane to keep flying or "floating" even after the engine is cut. This deficiency is magnified by the residual thrust peculiar to jet engines.

CONTRARY to pessimistic predictions, the XFD-1 did not show those tendencies to a serious degree, performing in the groove exactly like a conventionally-powered fighter. Despite the *Phantom's* gratifying performance several artificial means of getting the airplane down or getting an apparent stall spread are being developed by the Fighter De-

Stubby but streamlined the jet XFJ-1 looks every inch a fighter; air intake is located in the nose, with engine behind the pilot

sign Branch, BUAER, cooperating with NATC PATUXENT and civilian contractors. Among the most promising of these are thrust spoilers and drag devices which may be operated in conjunction with the throttle, or possibly actuated by the throttle lever itself.

Another peculiar characteristic of jet engines, present in all types to some degree, is their relatively slow response to throttle adjustments in the low throttle range. Though this delay in accelerating or decelerating may be only a second or less, it may create quite a problem, especially for wave-offs, when one considers that in one second an airplane traveling at 90 mph. will have gone 132 feet! Again, however, contrary to pessimistic expectations, the *Phantom* took a wave-off successfully very much like conventionally-powered fighters.

A general solution to this problem for future jet airplanes would be the use of the drag device mentioned above, partially opened during approach to artificially create extra drag to offset the use of a high throttle setting. If the airplane received a signal to land, the pilot would cut the throttle, thereby cutting the engine and fully opening the drag device. If the pilot were given a wave-off, he would retract his drag device, which would have the same effect as

Versatile new amphibian XJL-1 is ready for rescue work, target towing, photography, transport; has gear for carrier operation

the addition of thrust equal to its drag before retraction.

A thrust spoiler might be used, in which case the jet would be kept at a medium or higher throttle setting during approach, and any necessary decrease of thrust would be accomplished by the use of the spoiler (some sort of jet deflection device, for instance). Then, if a wave-off were necessary, the pilot would merely retract the spoiler and instantaneously get back the full thrust of the engine at that particular throttle setting.

The tricycle-type landing gear, which is used by all jet craft built for the U. S. Navy to date, also presents problems for carrier operation. These include revised barrier arrangements and the tendency for the airplane to slam down on the nose wheel after the hook has engaged the wire. This type gear is used, however, because it eliminates the aerodynamic bounce caused when the main wheels hit first, keeps the jet blast off the deck, eases taxiing, affords better visibility on the ground, and has far less nose-over tendency.

Despite these difficulties the Navy has succeeded in developing jet aircraft which, though carrier operated, can compete with land-based jet aircraft. (*Continued next page.*)

Twin engines give helicopter XHJD-1 greater safety reliability; either 450 horsepower Wasp engine is able to drive both rotors

A VERSATILE mid-wing amphibian, XJL-1, built by Columbia Aircraft Corporation, will replace the Navy *Duck*, JRF. It is powered by an engine delivering 1,425 horsepower for take-off, and is equipped with JATO for rescues in heavy seas.

As a search and rescue plane, the XJL-1 can carry three litter cases in the hull in addition to three ambulatory passengers. Improved hydrodynamic characteristics permit open sea landing and takeoff to rescue survivors of airplane crashes or ship sinkings.

Besides search and rescue, the amphibian is equipped for target towing, aerial photography, and cargo and personnel transportation. It has a carrying capacity in excess of 2,000 pounds, and as a personnel transport it can carry six passengers in addition to the pilot and observer.

Designed also for carrier operation, the XJL-1 has catapult gear, arresting gear, and folding wings. New to light amphibian planes is the use of tricycle landing gear. It is also the first Navy amphibian to have the main gear retracting into the wings instead of the hull.

Maximum gross weight of the XJL-1 is about 13,000 pounds. It has a top speed exceeding 200 miles per hour at sea level and a service ceiling of over 23,000 feet. The length is 43 feet and the wing span 50 feet.

THE WORLD'S largest and first twin-engine helicopter is the Navy's XHJD-1, produced by McDonnell Aircraft Corporation in collaboration with BUAER. In common with other helicopters, it takes off and lands vertically, hovers motionless, flies forward, sideways, and backward.

Two 450-horsepower P&W Wasp Jr. engines power the two lifting rotors which are arranged side by side. The 40-foot blade rotors turn in opposite directions, making a tail or torque rotor unnecessary. Span from rotor tip to rotor tip is 81 feet.

The use of twin engines is intended to give the XHJD-1 greater reliability for safety over rough terrain, populated areas, or water. The helicopter will cruise at more than 100 miles per hour with a useful load of over 3,000 pounds. It will fly on either of the two engines, which are mounted midway on the pylons extending from the fuselage out to the rotor hubs. Either engine can drive both rotors through a system of over-running clutches.

Test flights are currently under way for the Navy's newest primary trainer, the XNQ-1. Built by Fairchild, it represents the first major advance in primary training aircraft design since World War I, and is the result of extensive research by BUAER.

The trainer is a low-wing, all metal, two-place airplane. It has a tandem seating arrangement for the student and instructor. Other features include retractable landing gear, flaps, controllable pitch propeller, complete flight instruments, radio equipment, and a bubble canopy.

It is powered with a nine-cylinder radial Lycoming engine developing 320 horsepower. Due to its special design and the bubble canopy, the visibility from both cockpits is excellent, an important safety feature since most training accidents have involved collisions, either in flight or on the ground.

Stall speed of the XNQ-1 with the flaps down is approximately 53 miles per hour and the rate of climb is around 1,200 feet per minute at sea level. High speed will be approximately 170 mph. The design incorporates adequate stall warning and stall characteristics with the stability and controllability inherent in carrier based aircraft.

The cockpit of the XNQ-1 permits identical arrangements for instructor and student and is in accord with standardized functional arrangements developed by the Navy. Complete flight instruments have been included in order to permit giving flight instruction under instrument conditions or under contact conditions with equal facility.

SPECIFICATIONS OF NEW PRIMARY TRAINER XNQ-1 RESULTED FROM EXTENSIVE RESEARCH

BEST ANSWERS

WINGED WORDS

1. **The statement "I have not yet begun to fight!" was made by**
   - ☐ *a*–Lord Nelson.
   - ☐ *b*–Matthew Calbraith Perry.
   - ☐ *c*–John Paul Jones.
   - ☐ *d*–Stephen Decatur.
   - ☐ *e*–George Dewey.
2. **The famous report "sighted sub —sank same" was sent during the**
   - ☐ *a*–Battle of the Java Sea.
   - ☐ *b*–Battle of the Atlantic.
   - ☐ *c*–Invasion of North Africa.
   - ☐ *d*–Guadalcanal campaign.
   - ☐ *e*–New Guinea campaign.
3. **"We have met the enemy and they are ours" appears in a dispatch of**
   - ☐ *a*–Lord Nelson.
   - ☐ *b*–Oliver Hazard Perry.
   - ☐ *c*–John Paul Jones
   - ☐ *d*–David Glasgow Farragut.
   - ☐ *e*–William Thomas Sampson.
4. **"Cheer up, and get busy" was a slogan originated by**
   - ☐ *a*–Lord Beatty.
   - ☐ *b*–Lieutenant James Lawrence.
   - ☐ *c*–Admiral Dewey.
   - ☐ *d*–Commodore David Porter.
   - ☐ *e*–Admiral Sims.
5. **The famous order "Take her down!" was issued by**
   - ☐ *a*–Admiral Byrd.
   - ☐ *b*–Howard W. Gilmore.
   - ☐ *c*–Richmond P. Hobson.
   - ☐ *d*–Admiral Jellicoe.
   - ☐ *e*–John D. Bulkeley.
6. **The celebrated reply "We are ready now" was made by**
   - ☐ *a*–Commodore Schley.
   - ☐ *b*–Admiral Sampson.
   - ☐ *c*–Commodore O. H. Perry.
   - ☐ *d*–Captain Taussig.
   - ☐ *e*–Captain Mahan.

(Answers on Page 40)

VR-5–Navigation department of this NATS squadron has one of the Navy's biggest flight charts. A Lambert Conformal projection of an 80-mile wide strip covering the airways from Seattle to Oakland will be used by personnel in the Link trainer department to set up a Link flight to Oakland. The chart measures 30" wide and 25' long. The chart, completely sealed, will facilitate use of Links, with emphasis on instrument take-offs and landings at Seattle and Oakland, range procedure and navigation.–*NATS News Letter.*

NAS TILLAMOOK–The state patrol borrowed the services of an ordnance expert from this station to identify a piece of material washed up on the beach near Rockaway, Ore. The station gunnery officer identified the flotsam as an aircraft parachute flare and took it back to the station where he "decommissioned" the flare

DID YOU KNOW?

Three Advanced Bases Are Closed

Student Input Feels Expenditure Cuts

Need for reduction in expenditures has brought about the closing down of three air bases devoted to advanced training.

NAS HUTCHINSON, and NAS FORT LAUDERDALE were deactivated 1 October and NAS MIAMI will be deactivated as soon as the Advanced Command training load permits, such action being taken not later than November 15.

The Reserve unit will stay there.

Other changes in the training program of naval aviators have been announced by Aviation Training Division, DCNO (Air).

They include reducing the input of basic graduates to advanced from 1850 to 1600 a year, lengthening Preflight course to 30 weeks and allowing only midshipmen under the Holloway plan to enter Preflight.

All basic graduates in excess of desired advanced input number will be released to inactive duty. Selection of the 1600 per year will depend on the voluntary return to inactive status of basic grads.

If too many desire to remain on active duty after finishing Pensacola, the Chief of Naval Air Training will select the best qualified aviators for further duty and training. All NAP's, regardless of qualification, may remain, those not wanted for advanced work being sent direct to fleet or NATS duty.

All aviation cadets and enlisted personnel who are qualified for flight training and are selected for retention will be given a chance to transfer to meet the Holloway plan for college training before entering actual flight training.

Desirous of living up to the conditions of any and all contracts between the Navy and flight students, Chief of Air Training emphasized that all personnel desiring to finish basic flight training will be given that opportunity despite the roll-ups and cut-backs.

VRF-1 Deployed to NAS Norfolk

Floyd Bennett Returned to Civil Status

Following the recent revocation of Floyd Bennett as a Navy airfield and its subsequent return to the City of New York by a Presidential order, VRF-1 has been deployed at NAS NORFOLK.

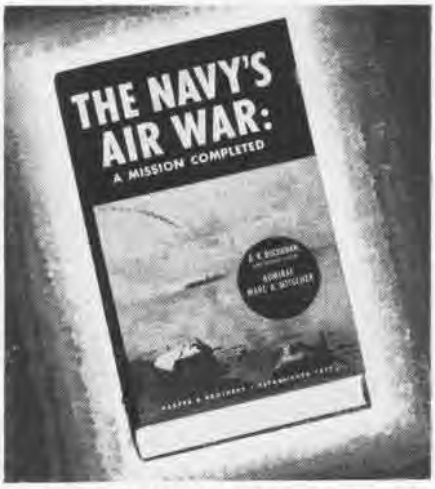
This move resulting from the ComNATSLant order ended a long tour of duty for the Ferry Command squadron at NAS NEW YORK. Even before its official commissioning in December 1943, VRF-1 was operating from the metropolitan area under the title of an Aircraft Delivery Unit.

All east coast movements of ferry aircraft will still be under the cognizance of VRF-1.

'Navy's Air War' Goes on Sale

Official Book Tells Story of Aviation

The official story of the Naval air war in all its aspects—the battle report of air actions in the Atlantic and Pacific which contributed to victory on both fronts—is contained in *The Navy's Air War*, which goes on sale Oct. 30.



OFFICIAL NAVY BOOK TELLS OF AIR WAR

Written by the Aviation History Unit (OP-519B) of DCNO (Air) and published by Harper & Brothers, the book will be of value and interest to everyone connected with the aerial branch of the Navy. The book runs to 150,000 words of text and is illustrated with 32 pages of official pictures. Written by trained historians, the book still has a popular style that makes it easy reading.

The book is priced at $3.50, but a 40% discount from this is allowed on all group orders for 25 or more copies from a station. This price is f.o.b. New York.

Navy Neptune Sets New Record

Flies 11,236 Miles from Perth, Australia

Speed and distance records in aerial flight have been falling with regularity from the time the Wright Brothers soared off Kittyhawk's sand dunes, but the Navy at present holds the record for

BIG LOCKHEED PLANE SETS FLIGHT MARK

the longest airplane flight in history—an 11,236-mile hop in a P2V *Neptune* from Perth, Australia, to Columbus, Ohio. The gargantuan flight exceeded by more than 3,000 miles the previous record held by the Army Air Forces B-29 which flew from Guam to Washington, a distance of 7,916 miles.

Four Navy pilots and a 35-lb. kangaroo mascot made the flight in the *Truculent Turtle*, the newest patrol plane in the Navy's list. The plane took off from Perth with JATO, with an 85,500-pound load, far above its normal lift of 58,000 pounds. Time of flight was 55 hours and 18 minutes, averaging a conservative speed of around 200 mph. The plane had planned to fly to Washington, D.C., or Bermuda if fuel permitted but had to land in Ohio when its gauges showed only about 25 gallons left.

The *Turtle* bucked headwinds across the Pacific and iced up over Utah, when a tachometer quit and caused concern that the engine was going out. Two Wright 2300-hp. engines power the P2V. Most of the ocean flight was made on automatic pilot.

At the take-off, only 4,000 feet of runway was needed, thanks to four JATO bottles. The four pilots who alternated in flying the plane were Cdrs. R. H. Tabeling of Jacksonville, Fla.; W. S. Reid, Thomas D. Davies and E. P. Rankin of Washington.

CDRS. DAVIES. RANKIN. REID. TABELING

Repair Crew Flies to Prescott

Replace Engine During a Dust Storm

VR-8—An east-bound R4D-3 was grounded at the Prescott Arizona Municipal Airport due to a faulty engine. This gave VR-8 "Advanced Base" Operations its first opportunity to go into action.

A plane was flown to Arizona with mechanics and supplies. The number three engine was completely out of working order and the four engine needed repairs. A wooden work stand was procured from the Litch Field Park Naval Station, and a mobile hoist was driven 145 miles from the Army's Luke Field. At Oakland a second plane was loaded with a spare engine, spare parts, tools, and in case the borrowed hoist didn't get through, a portable hoist was dismantled, and crated.

Using automobile headlights and the mobile hoist, the engine was unloaded in an hour after the plane had landed at Prescott. It was installed at night with the aid of numerous flashlights despite a 30-knot dusty, cold wind. The plane was ready for flight the next day.

More difficulties arose however. The dust storm was followed by hail, sleet, and slashing rain and magneto trouble developed on the newly repaired plane. A new magneto arrived at Phoenix via a VR-3 flight and was flown to Prescott by a chartered Aero *Cub*. After a steady grind of days and nights of labor the plane was in commission four days after its grounding.

Marine Pilots Operate 'Links'

Stacking Problems Worked at El Toro

MCAS EL TORO—Shortage of Link trainer operators has required this Marine base to put its pilots to work as part-time operators, helping their mates take the 12-hour Link course which is part of ground school training.

A dozen new Navy Basic Instrument Trainer 45's are used with the regular Link syllabus to give students realistic stacking problems. Ground school built a small scale reproduction of Long Beach Airways Traffic Control. Students fill out their flight plan, file it, and show how Control would handle it. The pilot then can fly the hop in the new Link and see how an actual stack is worked.

Wind Washers Attain Big Time

Guam Squadron Uses Discarded Engine

NAB AGANA, GUAM—Upon termination of hostilities and rapid demobilization of manpower, the question of maintaining a clean and neat appearance presented somewhat of a major problem to personnel stationed at small

KING-SIZE WASHER ROUTS DIRT ON GUAM

Pacific atolls. As a result, the windmill washing machine, which was so prominent during the war, has taken on added burdens.

VP-32 has developed one with a 10-foot fan, mounted on the flywheel of a discarded one-cylinder gas engine. One end of the rocker arm is bolted to the piston to give the plunger the reciprocating motion. A friction brake is used to regulate the speed and stop rotation of the windmill.

Regulars Can Ask Blimp School

Class for LTA Men Starts in January

Requests for lighter-than-air flight training are desired from commissioned USN officers who meet qualifications set forth in BUPERS Circular Letter 87-46. Such applications must reach BUPERS Attn. Pers-316 by 15 November 1946, according to NavAct 70 provisions.

The circular letter specifies that anyone qualified for flight training must be an ensign or above, under 26, finished five semester or equivalent in college, physically qualified, have one year at sea or foreign duty, not separated from training for flight failure and hold C marks in flight aptitude tests.

Applications for the training will include flight aptitude scores and statement that the applicant has been examined and found physically and temperamentally qualified. Flight training for men selected will begin at Lakehurst in January, 1947.

SHOW ME THE WAY TO GO HOME

CONVOY INTERCEPTION

At 1100 GCT depart the carrier at position Lat. 02°-21'N., Long. 81°-15'W., for interception of convoy whose 1100 GCT position is Lat. 06°-05'N., Long. 82°-10'W.

Given:

1. Wind 16K. from 15°T.
2. TAS 140K.
3. Convoy course 120°T. speed 12k.

Find:

1. Plane
   (a) DRM. (b) SRM. (c) T.H. (d) Cus., (e) G.S., (f) ETA.
2. Convoy
   (a) Position at Interception
   (b) Mi. from 1100 GCT Position.

(Answers on Page 40)

Electronics Basic Work Longer

Training for AETM's to Last 42 Weeks

Reflecting the increasing importance of radar and electronics in the Navy's future, the basic training course for aviation electronic technician's mates will be broadened from 20 to 42 weeks, BUPERS has announced, effective 4 November 1946. The present 28-week advanced course will be retained.

Trainees are selected on the basis of three standard Navy tests which are given all recruits. They include tests of arithmetical, mechanical and electrical reasoning, plus a general classification test.

Students learn radio transmitters and receivers, search radar, radio direction finders, radar fire control, landing approach systems, radar countermeasures and Loran.

Classroom and laboratory instruction in the basic phase will be boosted from 800 to 1,680 hours by virtue of the expanded course, to be given at Great Lakes, Treasure Island and Del Monte, Cal. Advanced AETM's go to Ward Island.

Alameda Barracks to House EM

Married Couples Get Big Morale Boost

NAS ALAMEDA—This station has taken steps to alleviate the housing shortage in the East Bay area by opening the first of 241 apartments for married enlisted personnel. Wartime barracks on the station were converted into smart living quarters, seven to a barracks. Cost of remodeling the barracks was $602,000. Names of the buildings will be the *Cabot, Enterprise, Essex, Hornet, Langley, Lexington* and *Yorktown*.

Building of the quarters called for some ingenuity on the part of the station Public Works department. To get around a lumber shortage, rough oak lumber was acquired, along with a Seabee sawmill from Camp Parks. This was set up on the station and the oak converted into flooring at a fraction of the contemplated cost for the project.

Marines Move Men for 1c a Mile

Cherry Point Survey Shows Travel Cost

MCAS CHERRY POINT—It costs slightly more than a cent to transport a Marine one mile by air, Second Marine Aircraft Wing determined after analyzing transport aircraft costs between Parris Island, South Carolina, and various east coast stations. The majority went to Cherry Point, Camp Lejeune and Quantico.

Cost to transport personnel for the two weeks' period of the survey via air was computed from the cost of fuel and oil consumed for the operation. Following are figures compiled as a result of the test:

Total flying time—792 hours
Total fuel consumed—140,526 gallons
Cost of fuel consumed—$19,863.75
Total oil consumed—1,976 gallons
Cost of oil consumed—$751
Total number of passengers carried—5,885
Total number passenger miles—1,761,182
Cost to transport one man a mile—$.01172

A number of factors tended to raise cost and time of this operation. No flights were made under instrument conditions, and when unfavorable weather was encountered, the flight returned to base. Cost of uncompleted trips, however, was figured in the cost of operation. Cost of running the aircraft without passengers also was entered. No deductions were made in fuel and oil consumption figures for warm-ups, taxiing, and off-course flying in case of unfavorable weather.

'Birthday' Of Naval Air Aug. 30

Research Determines When It Started

To clear up some confusion over the "birthday" of Naval Aviation and to gain facts about its early days, a survey of Naval records was made recently and determined that 30 August 1913 was the official date when it was started.

On that date the General Board recommended "the establishment of an Air Department in the Navy" and that "the director proceed with the organization of a Naval Air Service suited to the needs of the Navy in war." This authorization, signed by Admiral George Dewey, senior member of the General Board, for the first time gave Naval Aviation official status.

Within the next six weeks—on 9 October 1913—as a result of the above, Franklin D. Roosevelt, then acting Secretary of the Navy, appointed a board of seven officers to draw up comprehensive plans for a Naval Aeronautics Service.

VP-124 Has Training Program

Pilots, Aircrewmen Have Jobs To Do

VP-124—A training program to keep its pilots and aircrewmen in combat readiness has been instituted by this squadron and may be of interest to other activities. The program is in addition to the PPIP and PPC syllabus the squadron has been conducting in the past.

It includes six hours of instrument flying each month, three hours of night radar navigation, two hours of night bounce, six hours of daylight navigation, six hours of visual and radar bombing and four hours of sleeve gunnery. Ditching and abandon ship drills are scheduled for each crew, both on the ground and when airborne. Each PPC whose white instrument card is not valid is to be rechecked.

All pilots are responsible for turning in each month a celestial fix, WAF-3 weather report, CSP 1270 contact report properly authenticated and a loran fix. Radiomen are required to check out at 14 words a minute in code and eight in blinker. Officers must check out at 12 and six respectively. Each department of the squadron requires each officer to complete a monthly written examination.

To keep an accurate check on each pilot and aircrewman, the squadron flight department has made up a flight report form to be completed by the PPC after each flight. The form is made up before each flight to include ACI and weather briefing.

JATO BOOSTS MARS IN AIR IN 37 SEC.

AVIATION WRITERS RIDE PHILIPPINE MARS OFF FRISCO BAY WATERS ON HAWAIIAN HOP

NAS MOFFETT FIELD—JATO, jet-assisted take-off, has proved itself fully capable of lifting the Navy's biggest seaplanes off the water as easily as it works on landplanes, boosting Naval Air Transport Service's *Philippine Mars* off San Francisco Bay in 37 seconds.

Utilizing 12 JATO units—two inboard of each inboard engine nacelle and four outboard of each inboard nacelle—the *Mars* was airborne 37 seconds after full take-off power was reached by normal engine operation.

Fifteen seconds after attaining full engine take-off power, the first four JATO units were fired, giving an increase of 1300 hp. The 12-second surge of power accelerated the huge craft from 40 knots indicated air speed to approximately 65 knots. The engines carried the plane at this speed for seven seconds more, when the eight remaining units were cut in—an increase of about 2,700 hp.—and 12 seconds later the *Mars* was airborne at 80 knots.

Resembling small bombs, the JATO units are set off electrically by controls operated from the pilot's pedestal. After they have burned out they are jettisoned to decrease both load and drag, on the airborne plane.

For the prominent aviation men who made the maiden flight in the *Philippine Mars* to Honolulu and saw JATO used for the first time on the big seaplanes, the test was interesting. The sudden acceleration was not particularly noticeable, but the burning jet units let out an ear-splitting "swoosh!"

JATO cuts take-off time and distance 30 to 50 percent, depending on wind and sea conditions, gives added power at the most critical time in take-off and increases plane stability during the run.

VR-5 Concludes R4D Operation

No More NATS to Fairbanks, Barrow

VR-5—Fairbanks and Point Barrow, scene of the fatal accident of Will Rogers and Wiley Post just 16 years ago, are no longer NATS stops. The R4D Arctic operation is now history.

In conjunction with that deletion of operations, all R4D's in this squadron have been assigned to surplus property for disposal, leaving VR-5 a "four-engined" outfit throughout.

Commercial airlines will take over air transportation into Fairbanks and Point Barrow to supply projects there.

Private Flying Again in Flatbush

Navy Leases NAS Site to Municipality

NAS Brooklyn—Evacuation of the major portions of fleet air units at Floyd Bennett is being rapidly followed by an influx of civilian aviation activity.

It all came about as a result of the arrangements agreed upon by the mayors of New York City and 'Flatbush' and the Deputy Chief of Naval Operations for Air. These arrangements resulted in the leasing by the city of the West side (Flatbush Avenue) of Floyd Bennett which was then occupied by Naval Air facilities and the subsequent transfer of Navy units to the far side of the field.

Flight operations are being controlled by Civil Aeronautics Authority, and the Navy is using the strip for takeoffs and returns to base only. Bounce drills and other practice sessions are being carried on at satellite fields.

Commercial flight operations started at Floyd Bennett on October 1, and its opening will tend to ease a good bit of the jam-up at LaGuardia which was the cause for this action.

Fleet Gets Special Device List

New Book Catalogs All Training Matter

An allowance list of special devices and training aids for forces afloat, prepared at the request of the Chief of Naval Operations, has been published by the Special Devices Center, Office of Naval Research.

The 90-page book replaces the old "T" list, offering for the first time a listing of training material prepared by the Bureau of Ordnance, the Bureau of Naval Personnel and Special Devices, and alloted ships of the fleet.

In addition to the Allowance List proper, the book offers descriptive material on each device and training aid. It is illustrated to provide easy and quick identification of material.

The Chief of Naval Operations has prepared a distribution list for the book. Additional copies may be procured by requesting CNO Allowance List for Forces Afloat, NavExos P-399, from the Special Devices Center, Office of Naval Research, Sands Point, Port Washington, L. I., N. Y., Attn: Publications Section.

ComNATS, VR-11 at Moffett Field

Transport Service Moves From Oakland

Pacific operations of the Naval Air Transport Service will henceforth originate from Moffett Field instead of NAS Oakland.

Following the earlier move on 26 August of VR-11 to Moffett, ComNATS Staff and ACSO (Liaison) NATSPac became located at the long-time blimp base south of Oakland on 1 September.

PBM PHOTOGRAPHS PERRY LAND GLACIER

Mariners Fly Near North Pole

Nanook Recco Planes Go Within 450 Mi.

Two Navy PBM's made the closest approach to the North Pole ever flown by a seaplane when they made long-range flights over the Arctic ice cap to within 450 nautical miles of the Pole. The flights were to make ice and weather reconnaissance studies for *Operation Nanook* in the polar regions.

Operating from the seaplane tender *Norton Sound*, which not too many months ago was pulling PBM's out of warm central Pacific waters, the *Mariner* covers 1400 miles. The expedition returned in October.

One flight was between Greenland and the Canadian Arctic to the Polar Sea and then along the north coast of the northernmost known land in the world. A similar flight passed over Cape Columbia, from which Rear Adm. Robert E. Peary set out for the Pole in 1909.

The planes carried extra rations, survival gear and winter fuels. Navigation was done with the aid of an electric gyro-compass, which functioned well despite nearness of the magnetic pole. Ships' radar proved its worth in picking up icebergs, with as many as 30 appearing on the scope at one time, although berg conditions in the Arctic were better than usual this year.

ARCTIC-EXPLORING PBM BESIDE TENDER

Caribbean Liberty Must Be Fun

A Lootenant Has Himself a Hectic Time

NAS San Juan—Shore leave in the Caribbean:

1. A Lt. (jg) from Com 10 leaves for a trip to Havana. En route to Guantanamo City he gets involved in a knife-waving brawl but is unscathed.

2. When his plane lands at Havana airport it crashes, the only plane in 15 years to crash there.

3. He goes to a Cuban night spot and dances. Later that night, reaching for his purse to pay the bill, he finds it stolen, along with his money, travelers checks and plane ticket back to San Juan.

4. Driving in the suburbs with his girl friend the next day, he is arrested for speeding. He was thrown in jail and finally bailed out.

5. Disgusted with Havana, he took a taxicab back to the airport. The cabbie charged him $20 for the 10-mile ride.

Ditching Practice Bares 'Bugs'

Wrong Methods Brought Out by Drills

VRJ-1—Frequent practice is the best way to iron out bugs in abandon ship drills, this squadron has found. All plane crews are required to conduct at least one drill every two months.

Two discrepancies were noticed in recent drills. Crew members held responsible for life rafts and survival equipment have been removing the gear from its stowage and placing it near the assigned exit before the signal simulating the actual impact.

This is potentially a dangerous procedure. Heavy loose gear easily could cause injury to personnel, damage to the survival equipment itself and possibly block vital exits by being adrift in the plane upon impact.

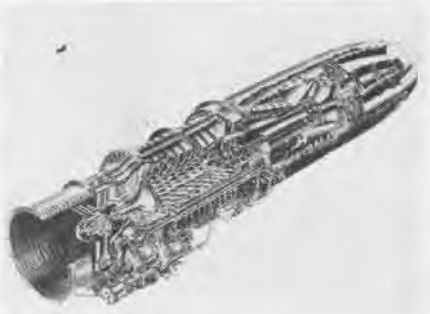
Also noted were instances of improper stowage of miscellaneous gear upon and around the life rafts and other equipment which could conceivably make access to them difficult. Following the "crash" landing and in instances where this stowage is near the main door of the R5D, this loose gear might jam the exit. "Graduation" exercises may include a proposal to hold a night ditching drill with all lights out and only flashlights permitted.

NAS Tillamook—At the request of Tillamook general hospital, 28,000 units of antitetanus serum was rushed to a man suffering from lockjaw, thereby saving the victim's life. The supply later was replaced by a shipment flown by an Army plane from a Portland, Oregon, air field.

FD-1 Gets Powerful Jet Engine

Production models of the Navy jet fighter, FD-1, will be powered by a lighter, more powerful version of the 19-B Westinghouse axial flow jet engine installed in the experimental model which made the first jet plane landing on the *Franklin D. Roosevelt*.

The new engine, the X19XB, weighs



X19XB JET ENGINE IS LIGHTER, STRONGER

660 lbs. compared to 785 for the earlier model, while turning out 17 percent more thrust. Increased output is secured by boosting cycle pressure ratio and improving the turbine design. Its static thrust at sea level is 1600 lbs. military rating at 17,000 rpm. The 19-B developed 1365 lbs.

The Navy's first jet fighter, the FR-1, is equipped with a radial flow, centrifugal compressor General Electric engine, the I-16. Because of its inherent design, the centrifugal-type jet has considerably greater diameter than axial-flow.

Two other new jet fighters being developed by the Navy, the FJ-1 and the F6U, both are powered by different type engines still in confidential classification.

Navy Aids Victims of Earthquake

Planes Carry Supplies to Dominicans

VP-201—Two planes of this squadron recently transported medical supplies, personnel and food to Matanzas, Dominican Republic, to assist in the emergency caused by earthquakes and tidal waves. The mission required landing heavily-loaded seaplanes and transferring supplies and personnel under open sea conditions with a minimum of equipment.

After landing, contact was made with a small Dominican Republic vessel. The sea was moderate with slight swells. The aircraft were anchored about 100 yards off each quarter, and a ¾" manila line was passed to the vessel by each plane. Supplies were transferred in life rafts using the lines in a hand-over-hand fashion to eliminate necessity of paddling.

In this manner, each plane transferred about 3,000 pounds of material in an hour. The feat brought a letter of commendation for the aircraft crews from Comdr., Caribbean Sea Frontier.

RADAR SPOTS BAD STORMS AHEAD

THE COMMANDING officer of NATTC BANANA RIVER was flying along one day when he ran into a solid line of squalls extending across his flight route. His plane radio and ADF were inoperative, so he landed at a nearby airfield.

Installed in the aerology office there, a PPI scope attached to a search radar was located where all pilots could look at it prior to takeoff. It had a 100-mile range and on it pilots could readily spot heavy rainfall and thunderstorms.

After watching the scope an hour he spotted a slight break in the weather along his route, plotted a compass course from the radar and resumed his flight.

This incident resulted in considerable support being given to a proposal to have such radar scopes installed at all possible naval air stations to help pilots spot bad weather ahead of them and avoid it.

On 21 March 1946, CNO had issued a letter to all CO's advising them radar equipment in limited quantities was available for radar storm detection purposes, including the AN/APS-2, AN/APS-15, SG, SO-7M and SO-12M/N sets. Available and suitable for winds aloft determinations are MK4 and SCR-545.

Such radars can be obtained from CNO, provided that installation, maintenance and operation can be effected without additional increase of radar personnel and station facilities.

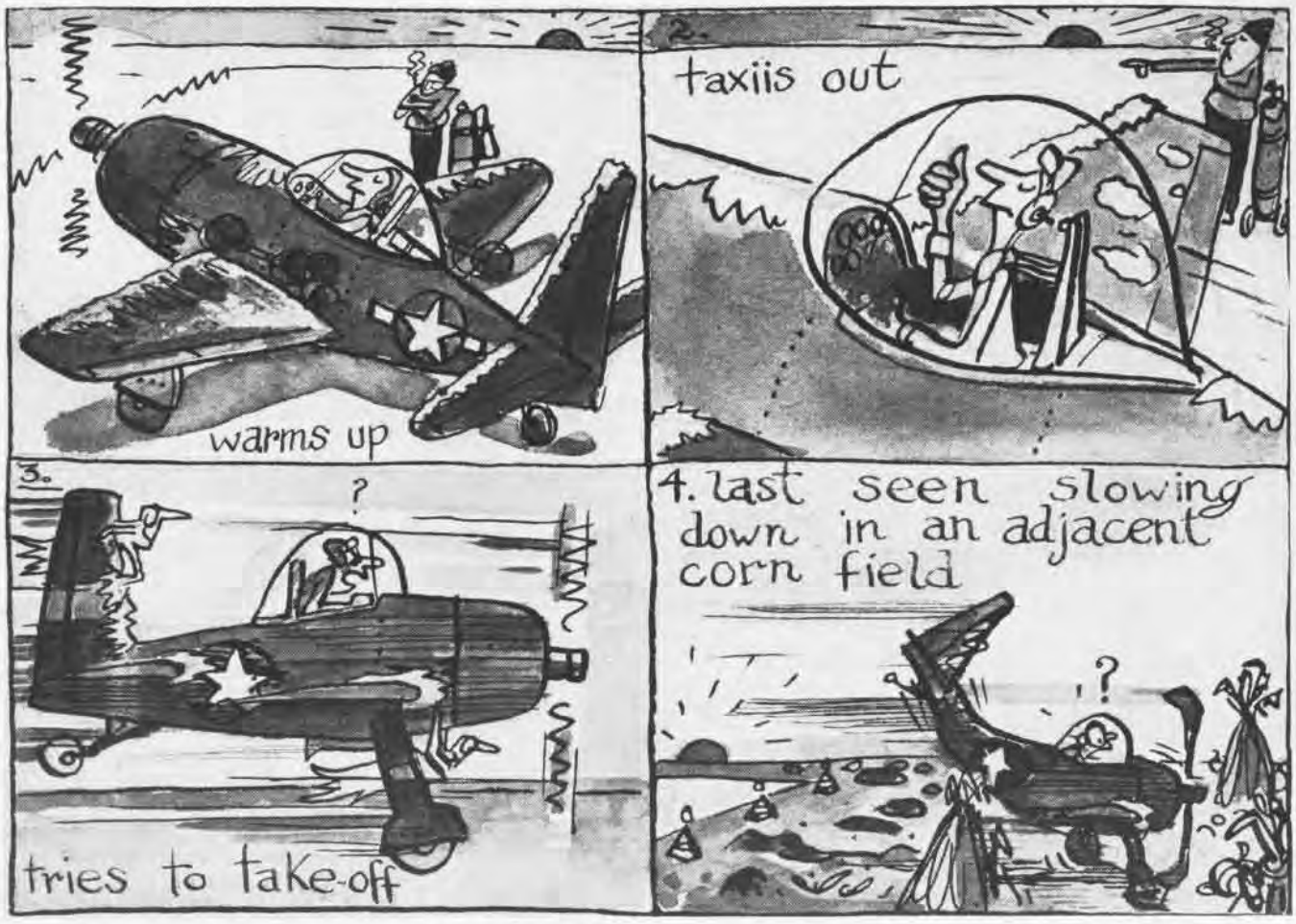
Maximum utility of the equipment is attained when radar indicators are installed in the aerological office. In this connection, installations at NAS LAKEHURST, CORPUS CHRISTI and MCAS CHERRY POINT have been operated successfully by aerological pensonnel. Lakehurst and Cherry Point are making research comparisons of S, X and K-band radars to see which will work out best for such weather spotting.

Electronics training section of CNO Aviation Training reports that it would be advantageous to incorporate such a system as an integral part of the program to standardize control towers and low visibility approach equipments (GCA). A number of pilots have reported using their airborne radar equipment for navigation around storms.

Naval Air Training Command, Pensacola, stated that it believed installation of storm detection radars at central aerological stations along coastal areas would reduce hazards of weather, offer advanced warning of severe weather and save many valuable hours of flight time in the training program.

The Naval Air Technical Training Command also is interested in the proposal and suggested that consideration be given to providing the Aerographer's Mate school at NAS LAKEHURST with radar equipment and instructors. Operator training then could be included in the regular course for that rating.

HAPPY BIRTHDAYS *are an everyday affair on the USS Randolph (CV-15). Just when a sailor is feeling homesick and forgotten, a baker brings in one of these tasty super-frosted, double-decker birthday cakes, delivered with the compliments of the Skipper, Capt. J. R. Tate. Vital statistics are secretly checked and delivery of the cake comes as a complete surprise. Morale runs high as testified by the smiles of these enlisted men*



LT. (JG) "BUM" LIFT

Moral: *Remove any frost, snow, or ice deposits before attempting a take-off.*

Cold weather take-off presents a series of additional operational hazards arising from frost, sleet, snow, and ice. Aircraft accident reports offer conclusive evidence of the seriousness of these hazards. A thorough understanding of these effects is mandatory for all pilots concerned with cold weather operations.

The failure to remove frost, snow, or ice from aircraft surfaces, and especially the control surfaces, has caused take-off accidents. Serious accidents in this category have usually been caused by a combination of: obstruction of control surfaces; decrease of aerodynamic efficiency of the wings and propeller; and the increased stalling speed resulting from the extra weight.

A carefully planned flight prior to take-off is the best insurance in the prevention of winter take-off accidents. This planning should include thorough aircraft inspection as well as proper power plant check. The prevention should include:

1. Removal of all snow, frost, or ice deposits from the wings, ailerons, and propeller surfaces. Hard ice formations may be concealed by loose snow. Ice and frost are found primarily on the horizontal surfaces rather than vertical surfaces. Removal may be accomplished by rubber scrapers, knotted lines, or waste rags. Do not attempt to remove ice by applying hot water, for it will freeze again producing a worse condition than before.

2. During run-up in winter fog or rain, watch for icing on wings and propeller.

3. Check on runway and taxiway condition prior to taxiing out for take-off. When taxiing out avoid slushy spots. Splashed water may form ice on wings and stabilizer or ice up brakes and landing gear.

4. Avoid long periods of taxiing. Taxiing must be done at high R.P.M. to prevent spark plug fouling and this is not only hard on the brakes but increases tendency to skid and ground loop.

5. Clear engine thoroughly immediately before take-off. In cold weather, engines heat up less readily and are more prone to foul.

6. Don't take off without first re-testing all of the controls to insure that they have not frozen.

7. Avoid take-off in wet snow in borderline temperatures. Wet snow may freeze on the propeller and wings before altitude can be gained.

In addition to thoroughly understanding take-off hazards you must also understand the manner in which ice forms on the aircraft in flight during cold weather operations. You can fly during icing conditions if you know where to fly, how to use your de-icing equipment to remove ice when you encounter it, and if you appreciate your plane's limitations under icing conditions. Only if you plan your flight carefully before take-off, and follow your flight plan, can these extra hazards be reduced to a minimum!

Start your flight right and NEVER ATTEMPT A TAKE-OFF WITH SNOW, FROST, OR ICE DEPOSITS ON THE PLANE.

FLYING 'ON THE STEP'? YOU JUST THINK IT'S SO

EVER hear a fighter pilot make one of the following statements:

"I wasn't getting the most speed out of my engine till I got my F6F 'on the step' and then she really rolled!"

Or:

"There are certain limits in my plane where the center of gravity should be located, but there is one spot where it flies best."

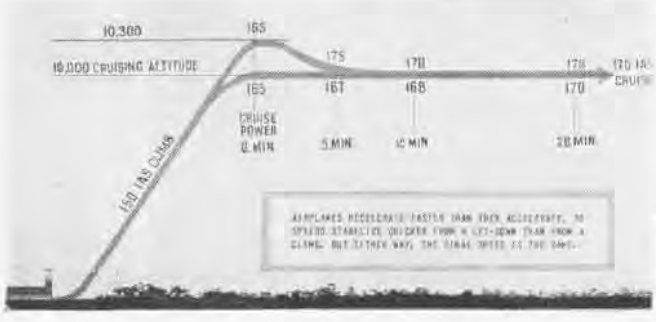
Those statements embody two popular misconceptions about flight which the Navy and Army are laboring to explode for all pilots, especially of landplanes.

First, there is no such thing as an "optimum CG." If an aircraft is stabilized in flight at any speed, with CG near the forward limit, and if then the CG is quickly moved to the rear limit, the tail will go down, speed will drop off, *and the aircraft will climb.* But, if the trim tabs are used so that the aircraft does not climb, *the speed will remain constant.*

Use of the tabs changes the load imposed by the tail, and calculations have been made to consider drag of deflected tabs, elevators and change in induced drag and downwash angle of the wing. These calculations indicated that speed should change slightly—about one or two miles an hour. Attempts were made by actual flight to prove this theory, but *no effect of CG position on speed could be measured.*

The tests proved that CG position has no effect on aircraft speed; therefore, it cannot possibly have an effect on the plane's range.

Pilots who insist on "optimum CG" say it is necessary before the plane can be flown "on the step." There enters another fallacy. Consider the matter of acceleration. On climbing to altitude and leveling out to cruising flight, it may take some time to accelerate from climb speed to cruise speed. The necessary speed increase generally will be about 20 mph. and at the start of a flight, the weight generally will be near the maximum gross. Depending on the weight-power relationship, the time required to accelerate to stabilized level flight from climb speed may vary from five minutes for a fighter to 20 or more for a heavy bomber or low-powered trainer.



In the case of a seaplane, reference to "step" operation while on the water is applicable. The hull supports the weight of the plane and as the P-boat accelerates for take-off the pilot rocks it forward and puts the hull "on the step," reducing the wetted area of the hull in contact with the water. The wings take over and the plane flies.

If a pilot flying an aircraft in the air were to rock fore and aft, he would never simulate seaplane operation since the wetted area or the area of the wing in contact with the air never changes as does the hull of a seaplane while taxiing in water.

The phrase "level flight" must be given some consideration. If a heavy bomber is trimmed precisely to level flight at long range cruising speed and the trim then is disturbed to give 30 ft min., rate of climb or descent, the speed increase (for dive) or decrease (for climb) will be about 5 mph., or 1 mph. per 6 ft/min. Thus a small and perhaps unnoticed out-of-trim condition will cause fluctuations in IAS. *CG position will not cause this effect.* It is due entirely to nicety of trim.

The practice of climbing over and then letting down to cruising altitude may result in a trim condition which will give a slight descent, and therefore an IAS slightly higher than "stabilized" IAS. The gain from this practice is doubtful in view of the higher fuel consumption in climb.

It may be pointed out that an aircraft in level flight will decelerate faster than it will accelerate, because of the shapes of the power required and power available curves. This holds true for all prop-driven aircraft. Therefore, an aircraft dived into level flight will stabilize in less time than one which is climbed into level flight. The speed difference while approaching stabilization is slight, and has minor effect upon total range.

The next time you think your airplane is "on the step," try to get it off *without changing altitude or power conditions.* Meteorological conditions such as rising or falling air masses can exist which may give a realistic illusion of "on" or "off the step" performance.

Conclusions: Operate the airplane within the allowable CG limits for controllability and stability. Any further refinement of CG location will have no effect on speed or range. Stabilize and trim your airplane properly for cruising and you will find it impossible to mush along through the air.

[BASED ON AAF T.O. 00-25-58, STEP AND OPTIMUM CG]

LSM-458, EQUIPPED WITH TWO CYCLOIDAL PROPELLERS, REVERSES DIRECTION QUICKLY IN MANEUVERABILITY TEST AT PUGET SOUND

NEW PROP MAY REPLACE WING ON FUTURE SUPERSONIC PLANE

SHIPS WITH the maneuverability of automobiles, planes without wings that hover and exceed the speed of sound are two of the developments believed possible with the relatively new cycloid propeller. Designed by Professor Kirsten, of the University of Washington, inventor of the Kirsten radiator smoking pipe, the cycloid surpasses limits of screw-type marine propellers and may boost performance of aircraft carriers and seaplane tenders.

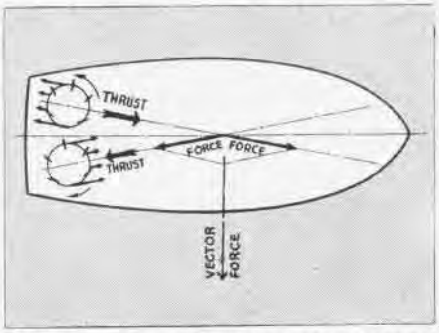
In experimenting with the use of the cycloidal propeller on ships, tests have been conducted in Puget Sound on LSM-458 *(above)*. Results have shown a 14% increase in propeller efficiency, plus good maneuverability.

Cycloid propeller consists of a circular, steel-housed rotor with from four to eight vertical blades. The attitude of each blade attains a high pitch setting as it reaches the proper point of arc, and automatically full feathers on the opposite point of the rotor when the blade is moving away from the direction of the slip stream.

Two propellers were connected to the testing LSM's twin drive shafts with a right angle, beveled gear drive. The ship, powered by conventional General Motors diesel engines, was then able to turn 360° without leaving its original starting position.

Besides a universal change of thrust direction, the new prop has been found to be free from cavitation, formation of a vacuum around the screw which is usually detrimental to both efficiency and the material of the screw itself.

Tests to be held in the near future on PT boats will determine the anti-cavitation properties at high speeds. If no cavitation occurs, it is quite probable that cycloid propellers will be installed on all new combatant ships in the Navy, particularly carriers.



SIDEWAYS MOORING USING CROSS THRUST

Largest carriers would be able to navigate the Panama Canal as easily as a car pulls into a driveway. The cycloid prop is especially practicable for escort carriers which are difficult to maneuver at low speeds.

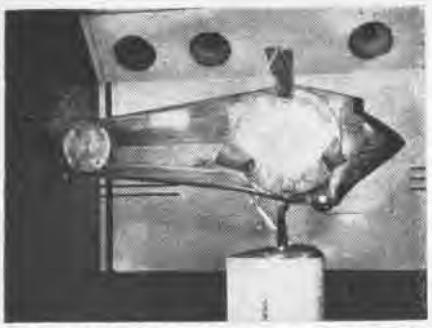
The cost of installation is considerably above that of the screw-type propeller, but the elimination of a rudder and rudder engines would bring the expense more nearly even. Other factors justifying the cycloid are the increase in speed, less fuel consumption, greater endurance, better maneuverability.

CYCLOID propellers on aircraft have even greater potentialities. The full-feathering cyclogiro is expected to hover as well as to exceed the speed of sound without the use of jet engines.

A wind tunnel model, being analyzed at the Research Laboratory of the University of Washington, has been constructed with cycloid props on each side of the fuselage, replacing wings.

The cyclogiro's "wings" rotate about a spanwise axis and are controllable to suit any ratio of forward to rotational speed. When the blades are in low pitch, the rotational speed exceeds the forward speed of the plane, giving the cyclogiro low landing speed and the ability to hover.

Engines will run at the most efficient RPM, speed being controlled by blade pitch. Highest pitch permits the speed



CYCLOGIRO MODEL HAS A 3-BLADE ROTOR

of the aircraft to more than double that of the cycloidal blades. Since the whole blade rotates at the same speed there is no difficulty from tip velocity. It is believed the cycloid rotor will be able to approach the speed of sound while the entire plane is traveling in the supersonic range.

Present jet-designed supersonic planes are faced with the problem of sustaining low enough landing speeds for safety. German jets were forced to land on skids. The cyclogiro would end its supersonic mission by dropping lightly on a few feet of runway.

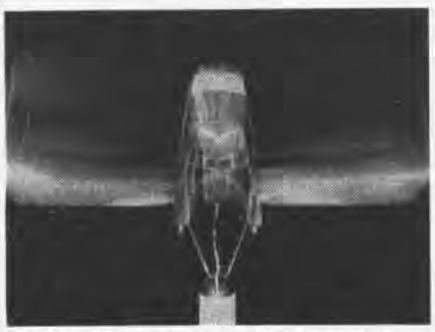
Parasite drag on the model being tested has been found to be essentially the same as that on wings of conventional aircraft.

More than 95% of the power supplied to cyclogiro blades is converted to useful thrust horse-power.

The right and left cycloids, which deliver lift as well as thrust, rotate in opposite directions, the bite being taken at the top on one and at the bottom of the other rotor. This arrangement has made the counter torque problem practically a negligible quantity.

Low pitch maneuverability may equal that of the helicopter, rising and descending vertically, turning while hovering and even backing. Rolling and yawing is obtained by differential control between the direction of thrust of the blades of the right and left rotors.

Short span and low landing speed of the rotating-wing aircraft should make it possible to take-off and land on flight decks. One hundred-ton bombers on present carrier may be a possibility with the advent of the cyclogiro.



ROTATING WINGS PROVIDE LIFT, THRUST

HIGH SPEED BAIL-OUTS

IN DEVELOPING combat aircraft with increased altitude and speed, it is necessary to consider the possibilities for escape in an emergency. Flight surgeons and others will be interested in some of the physiological factors concerning escape which must be considered in the design of new planes. Escape from advanced type fighter aircraft presents many new problems. In conventional-type fighters, the problem of escape has not been solved satisfactorily—there are instances when the pilot has been killed or injured because he did not clear the plane.

The air blast past a rapidly moving plane is such as to interfere with efforts to project one's body far enough from the plane to clear such projections as the tail assembly. It would seem essential to provide personnel in high-speed aircraft with every aid which will facilitate escape from the plane with a minimum possibility of striking these projections.

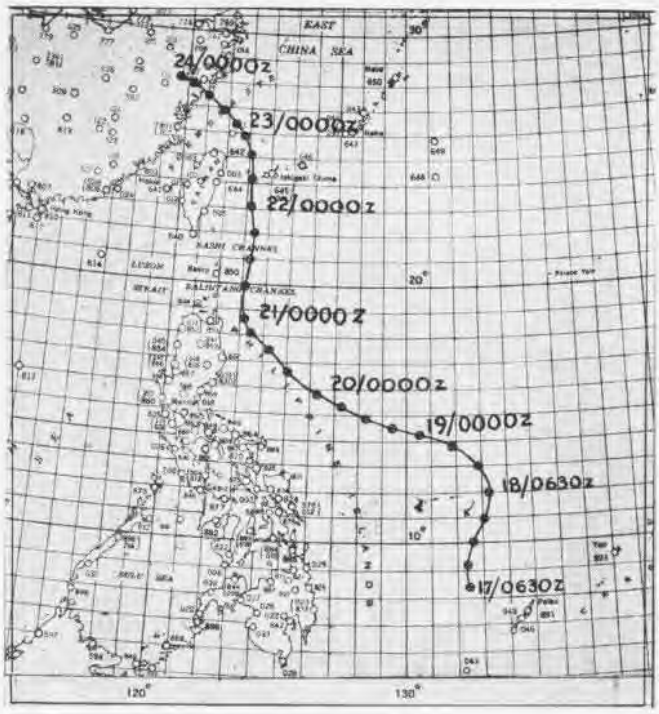
The German scientists, in their attempts to solve escape problems, had developed a catapult seat to eject personnel from aircraft. Under experimental conditions, subjects stood sudden blasts of 531 mph for 1.5 to 2 seconds. They could stand this only if blasts were expected. In their experiments on vertical acceleration in the DO 335, the Germans found that in order to blow the man 57.5' in air (in order to clear the tail), accelerations of 18 to 20 'g', with peak at 27 'g' of short duration (around 0.01 sec.), were necessary. In the DO 335 this was successful only through the use of arm rests. In horizontal acceleration, due to impact with wind stream, man is subject to an initial acceleration of 24 'g' which would be reduced considerably in 2 to 3 seconds. This is in the chest to back axis. Groundward acceleration may reach 6 to 10 'g' for approximately 0.01 seconds. The pilot may rotate. The catapult seat designed by the Germans was tilted backwards about 27 degrees and was equipped with stirrups for the feet. The seat was ejected from the cockpit by a charge of cordite in a 31" piston. These catapult seats are reported to have been used successfully in flight by the Germans.

Accelerative forces greatly complicate escape from aircraft. Studies on the centrifuge at Mayo Clinic demonstrate that movement in the direction of the radial 'g' forces is easy but hazardous. Falling one foot at 2 'g' is enough to knock the wind out of subjects. In attempting to move at right angles to an accelerative force, the average time required at 3 radial 'g' was increased by 10 times. At 4 'g' effective movement became virtually impossible. Subjects were unable to move directly against a centrifugal force of more than 2 or 3 'g'. Forces of these magnitudes will be encountered in aircraft in uncontrolled flight where escape may be attempted. A consideration of these forces indicates the desirability of many escape hatches.

Further complications result from use of pressurized cabins. In single-place planes or other craft with several small pressurized cabins, it seems likely that before leaving cabin it will be necessary to bring cabin pressure to ambient. The rate at which the cabin pressure is allowed to drop must not be instantaneous if it will subject the body gases to a wet gas expansion of more than 2.3 times. If the cabin is decompressed over a period in excess of one second in an emergency, it seems unlikely that serious harm will accrue at altitudes up to at least 50,000 feet. The Germans were experimenting with aircraft for very high altitude from which the pressurized cabin could be detached in an emergency and parachuted to lower altitudes while maintaining sufficient pressure to keep the pilot conscious.

IN THE case of larger aircraft with a crew of several men occupying a large pressurized cabin, the same conditions hold regarding emergency decompression. Care should be taken to insure that personnel are not too close to the region of the orifice through which cabin air is released to the outside, lest the blast of air impinge on them. If several men are to escape through the same escape hatch, it would be desirable to maintain cabin pressure while crew members are taking their turns. This would require a bailout-lock—such a lock might be useful for other procedures also. Rate of decompression for individuals in the lock must not exceed that recommended as safe for single-place cockpits.

Where bail-out is contemplated at altitudes above 40,000 feet, provision of pressure breathing oxygen equipment is essential. In addition, it is possible that personnel could leave the aircraft in a pressurized suit or in a small pressurized cell similar to the detachable cabin planned in Germany. For bail-out at very high altitude, a detachable pressurized cockpit may be essential for single-seat aircraft. (*Aviation Branch, Research Div.*, BuMed)



Erratic course of Pacific typhoon of 17 June to 24 June 1946 kept forecasters guessing. Planes from Guam and Manila tracked it

WEATHER PLANES RIDE THE TYPHOON TRAIL

Storm warnings for the fleet are accurate, detailed, and up to date. Reports gathered by Navy weather patrol planes enable the Navy Fleet Weather Centrals to furnish complete information to all surface craft in typhoon infested waters.

Whether a storm movement follows the usual pattern for a given area or behaves in an erratic fashion, the reconnaissance planes find out what's going on and report the position and intensity of any disturbance. By keeping a running plot of reported positions, the skipper of a ship can maneuver to avoid dangerous winds and high seas.

The April 1946 issue of Naval Aviation News in "Typhoon Recco" told the story of how naval aircraft locate and track tropical storms. Supplementing this over-all picture are the following two accounts of specific typhoon reconnaissance jobs.

The Pacific typhoon of 17 June to 24 June 1946 is particularly interesting to aerologists because of its erratic movement. It serves to emphasize the warning that you can't predict a typhoon's course. This particular storm was first indicated by a deepening low pressure area on a northward bulge of the equatorial front at approximately 8.5° N and 132.5° E, locating the depression about 300 miles north-northwest of Palau. Overcast skies persisted in this area throughout the night of 16 June, with heavy showers and local squalls reported by ships and aircraft.

The pressure continued to fall steadily, and the counter-clockwise cyclonic circulation increased in intensity. On the next morning the Navy's typhoon reconnaissance planes flying out of Guam found a small but intensifying typhoon with surface winds of 65 knots near the center. A slow northerly movement was indicated.

Typhoon warnings were flashed by Navy communications to stations and ships all over the world, giving the present position and intensity of the tropical cyclone as well as its movement and forecast positions 12 and 24 hours in advance. For the next 24 hours, as the typhoon moved north at 10 knots, the reconnaissance planes kept a constant watch on its tendencies. They circumnavigated the typhoon for accurate location and then flew into the very eye of the whirling storm to make pressure, wind, and other meteorological recordings.

On 18 June the typhoon turned to the left and steered a north-northwest course, maintaining its previous rate of movement. It continued in this trajectory for the next forty-eight hours, and aircraft reconnaissance reported that the typhoon had intensified, with winds in the central 50 mile radius now over 100 knots. The velocity of the typhoon proper speeded up to 12 knots.

Since the storm by now was far removed from Guam and approaching the northern tip of Luzon, Fleet Weather Central, Manila, took over the duties of tracking the typhoon and issuing all advisories. About midnight on the 20th the typhoon veered to the north again with indications that it would recurve to the northeast and pass close to Okinawa, scene of one of last year's most destructive weather outbursts. Instead, it continued on a straight northward course and headed for the China Sea.

The lowest pressure was recorded by reconnaissance planes operating from Manila on the morning of 21 June. The barometer read 981 millibars, and winds were measured at 120 knots. Very high seas were observed.

While directly west of the northern tip of Formosa and 70 miles offshore, the typhoon on the afternoon of 22 June started a gradual swing to the northwest and reached the China coast southeast of Wenchow on the next day. Heavy rains, high seas, and gale winds lashed this section of the Chinese coast as the storm came ashore. Once over land the typhoon winds quickly subsided. Overcast skies and widespread rain showers alone remained as evidence of the spent tropical menace.

Mission Typhoon is the name given by VP-116 to the following account of a typhoon recco assignment.

Late in March the usual cloudy and showery weather of the tropical front southeast of the Marianas was spreading out from a distinct line to a large, rough circular area, and reports of a northwest wind at Truk further led the Fleet Weather Central at Guam to suspect that a typhoon was in the making. The next day, 27 March 1946, a flight to the area northwest of Truk reported a close circulation of winds ranging from 30 knots over a 200 mile radius to 60 knots at a distance of 15 miles from the center of the circulation.

Moderate rain was encountered over the entire storm area with light turbulence at the 1000 foot level, and radar pick-up revealed clearly the periphery of clouds about the 25 mile circular "eye." From now on, the circulation was to be reckoned with as a young immature typhoon of the type which experience had shown intensifies very rapidly. Statistical data indicated it would travel west to northwest, over or near Guam, and while it was still an estimated 300 miles to the west-southwest of the Marianas, those islands were alerted and recco flights by VP-116 and VP-102 were begun.

On the following day, 28 March 1946, a dawn flight encountered 30 knot winds outside the base (Tinian) which grew to 45 knots at a distance of 150 miles from the center of the storm. Ceilings lowered to 1000 feet with light rain. From this position the plane, approaching the west corner

of the storm, encountered winds increasing rapidly to 75 knots with high seas and moderate turbulence. Altitude was kept at about 500 feet so that through occasional breaks in the clouds the pilot could follow the winds, which circle counter-clockwise around the storm, and the aerologist aboard took observations for in-flight reports.

To circumnavigate the storm, maintaining a constant radius, the flight should be made in such a manner as to keep the wind 20 to 30 degrees on the starboard quarter of the aircraft. In this instance, however, the pilot circled directly downwind, permitting the updraft of the typhoon to carry the plane to the more intense portion of the northeast corner where seas were masses of foam with winds estimated at 95 knots. Severe turbulence rocketed the plane between 2500 and 250 feet. It was evident that the storm had intensified rapidly and possibly would continue to intensify. With these valuable data now on hand, the plane turned crosswind to starboard and proceeded on the new course until winds dropped to 60 knots. The plane then returned to base.

Flights the next day faced the possibility of the typhoon accelerating and closing the home base. However, Fleet Weather Guam had evidence that the storm would maintain its westerly course at four to eight knots to pass to the south of Guam. A dawn reconnaissance flight was sent out, followed at three-hour intervals by two later flights.

Several fixes obtained during the day by reconnaissance planes indicated that the typhoon was turning west-southwest and would pass just south of Guam. The last plane returned in darkness to Tinian, where winds were under 35 knots. Guam had five inches of rain the following day. Winds were 45 knots with gusts to 60 knots bearing out the expected movement. A marked change in the distribution of winds, which until now had been of constant velocity, was observed during following flights as the typhoon passed a good 150 miles south of Guam. Winds in the SE portion of the storm area became exceptionally moderate, sectionalizing the typhoon with an oval eye which indicated that the typhoon might decelerate.

The typhoon was tracked by aircraft on its west-northwest course during the next three days, and a close watch was kept for recurvature to the north. Flights were then subject to care on the part of the pilot who had to judge closely the consumption of fuel for the long return flight against strong head and crosswinds. Circling of the typhoon was no longer ordered.

THE TYPHOON covered its greatest area on 1 April and was then about 500 miles west-northwest of Guam. The reconnaissance plane for this date left Tinian with instructions to locate the northeast quadrant of the typhoon, its most severe portion, and proceed to Iwo Jima.

This flight found that seas had become mountainous near the center because of the typhoon's rapid movement over a long path. When winds of 75 knots were observed, the plane was known to be within the northwest corner of the storm, and it was decided to return to base. As the airspeed was only 140 knots, being caught any deeper in this area would make ground speed so slow on an outbound course that four to five hours would be required just to get out of the storm. (There were 50 knot winds 210 miles north of the center.) An alternative would be to circle the typhoon over an unknown distance and then set a course for Iwo Jima through the intense northeast quadrant. The pilot, however, elected to take a heading so as to make good a course of direct north until he got the plane out to 45 knot wind areas after 2½ hours of flight. The plane was then flown to Iwo Jima, with average headwinds of 50 knots.

The last flight from Iwo Jima was exceptionally long. The storm had continued west and was but 200 miles east of the Philippines, and again the time for return was important. The landing conditions at the Philippines were not certain because of the rapid movement of the typhoon, so the plane would have to return to Iwo Jima. In this case the plane approached just near enough to the center to obtain a fix and return to base. Landing was made after a flight of nearly 14 hours. The typhoon was now considered as being out of the Marianas area, and Okinawa took over.

Lest these accounts of reconnaissance planes getting on chummy terms with typhoons should give anyone the wrong idea about how to deal with tropical storms, the Navy's aerologists have the last word. A pamphlet "Typhoons and Hurricanes," Aerology Series No. 10 (NAVAER 00-80U-21) has recently been prepared by Aviation Training Division, CNO. A 34-minute film (MN-119T) also is available. To quote:

"When a typhoon hits, even mighty warships shudder, and so do their skippers, as the relentless pounding of wind and wave goes on for hours. But a skipper does more than shudder when he hears a typhoon is headed his way. He instantly takes precautions and decides to get out of the typhoon path as soon as possible. He doesn't think he's sissy to run away from a typhoon."

Thanks to the recco planes it's easier now to keep tab on storms, and the grateful skipper knows which way to run.

Eastern side of typhoon on 23 June. Clouds in upper foreground indicate turbulence and rough riding for plane

Reconnaissance plane approaches hurricane from the southwest ready to circle ominous cyclonic whirl at 6000 feet

♦ SPOTTING

AERIAL BOS'N'S

ABM BADGE

IT WASN'T so many months ago that men aboard an aircraft carrier who handled the planes, catapults and arresting gear were a hodge-podge of ratings from seamen to ordnancemen. With establishment of an all-inclusive rating of Aviation Boatswain's Mate and a school to train men in those specialties, the Navy brought some order out of the situation.

Instead of a petty officer who knew nothing but plane handling or catapults, the school at NAVAL AIRCRAFT FACTORY, PHILADELPHIA, is turning out men who know plane handling, arresting gear, catapults, fire fighting, gasoline storage and handling and aviation seamanship. The day of the narrowly-specialized rating is past and the ABM now is a well-rounded technician.

♦ SEAMANSHIP
HOISTING PLANES IS A BOATSWAIN'S JOB

The school is under the Naval Air Technical Training Command. It takes in men from Aviation Fundamentals School, Jacksonville, and trains them for duties connected with all phases of carrier flight deck operations and general aviation duties. The 16-week course for ABM's started this year, although the school itself began in the summer of 1944 and trained only catapult and arresting gear crews, numbering about 37 on a carrier. During the war it turned out some 3,000 "graduates."

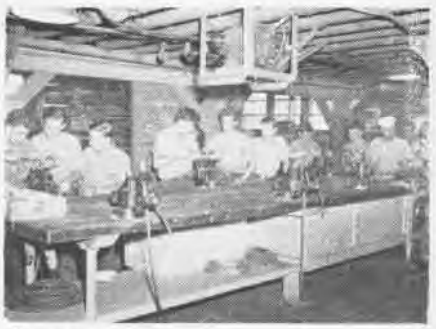
The students get their practical work next door at Mustin Field, where catapults and arresting gear are installed. Plans are being discussed to have an aircraft carrier, possibly the CVE *Block Island* at Annapolis, turned over to the school for certain periods so the students can get training on actual ship installations.

Jacksonville fundamentals school gives them an introduction to the various petty officer ratings in Naval Aviation. When they get to Philadelphia, they are given a course which consists of seven phases. Briefly, they are as follows:

Basic Phase The newly-arrived men in this part of their schooling get carrier indoctrination. They learn the history of the carrier and its organization. Fluids are discussed to the extent of principles of hydraulics, their mechanics, the packings, means of sealing high pressures, and the types of fluids used.

Important items of flight deck operation are the types, strength, and construction of wire rope and the pouring of sockets. Also included is the splicing of all types of cables, for arresting gear and barrier will break when put to rough usage. Another lecture covers electrical fundamentals such as circuits, switches, resistors, and solenoid relays.

Flight and Hangar Deck Operations A carrier whose flight deck worked slowly in launching and retrieving planes usually fouled up the rest of the task group during the war. The ones with teamwork and good deck crews got planes in the air fast for strikes or to head off attackers. Things that went into a smooth-working deck crew were knowledge of elevator operations, plane securing in all types of weather, rigging of booms and their operation, uses of plane-handling equipment, plane directing and spotting, taxi drills and signals, crash handling, night operations and cold weather operations.



♦ BASIC PHASE
BASIC PHASE TEACHES TERMINAL POURING

♦ PLANE DIRECTING
PLANE DIRECTORS LEARN TO FOLD WINGS

Those are all important items on a carrier and the school gives its students training in all of them.

Catapults The Navy has two general types of catapults with which its Aviation Boatswain's Mates must be familiar —the H-2 and the H-4. The former is a smaller version capable of launching up to 18,000-pound planes, although it was designed for 11,000-pounders. The H-4 can get the Navy's heaviest carrier planes off at 90 mph. It has a 96-foot runway, compared to 73 for the H-2. CVB's have a 200-foot runway.

Students not only learn about the catapults but actually toss planes into the air from them at the school's field installations. They learn about high

pressure air, pre-operational checks, safety precautions. Catapult deck procedure, signals, spotting and directing also are learned.

Arresting Gear Two kinds of arresting gear also are used by Naval Aviation, their fundamental difference being in capacity only. Students learn nomenclature, operation and maintenance of the Mk 4 and Mk 5 gear—the former designed to stop a 16,000 lb. airplane landing at 65 mph. relative to the deck and the larger one with 30,000 lb. capacity at 90 mph. Both types were designed and developed by NAF.

Gasoline Potentially as dangerous as its stores of high-explosive bombs and rockets were a carrier's gasoline storage tanks. Many of the worst fires on carriers hit by Kamikazes and enemy bombs during the war were due to explosions of gas tanks on planes or in the ship. For this reason, the course gives ABM's a good look into organization of fueling crews, safety precautions and chemistry of gasoline. Complete schooling on saddle tank gasoline systems includes component parts, theory of operation and maintenance, needed accessories and their proper care, inert gas system, tanks and voids, casualties and repairs, plane defueling and the common manifold.

◆ **ARRESTING GEAR**
CHART SHOWS ARRESTING GEAR WORKINGS

◆ **FIRE FIGHTING**
USE OF FOG NOZZLE SHOWN TO STUDENTS

Fire Fighting This phase emphasizes aircraft fire fighting although all types of fires are studied. Gasoline fires are among the worst a crew has to fight and a thorough knowledge of the Navy's tools to put them out is necessary. Fire prevention in aircraft, types of equipment to fight it, maintenance and operation, and organization of crews for fighting shipboard crash fires are studied at the school.

Aviation Seamanship The final phase of the school is in use of small boats in seaplane operation. Proper boat handling and the fueling of planes from boats, beaching, launching and hoisting planes aboard both ships and docks and the anchoring and mooring of small and large float-type planes are carefully and thoroughly studied.

Upon completion of the four-months course, men are assigned to duty by BuPers. That bureau is considering a proposal that general service boatswain's mates who have had aviation experience be permitted to change over to aviation boatswain's mates and sent to the school for thorough grounding in all the many specialties now included under the rating.

During the war the duties now assigned to the ABM rating might have been handled by an ordnanceman, a metalsmith, a mech, or a seaman. Some were given specialty rating designations depending on whether they were trained in catapults, arresting gear, gasoline or plane handling duties. Today's ABM knows all of those things.

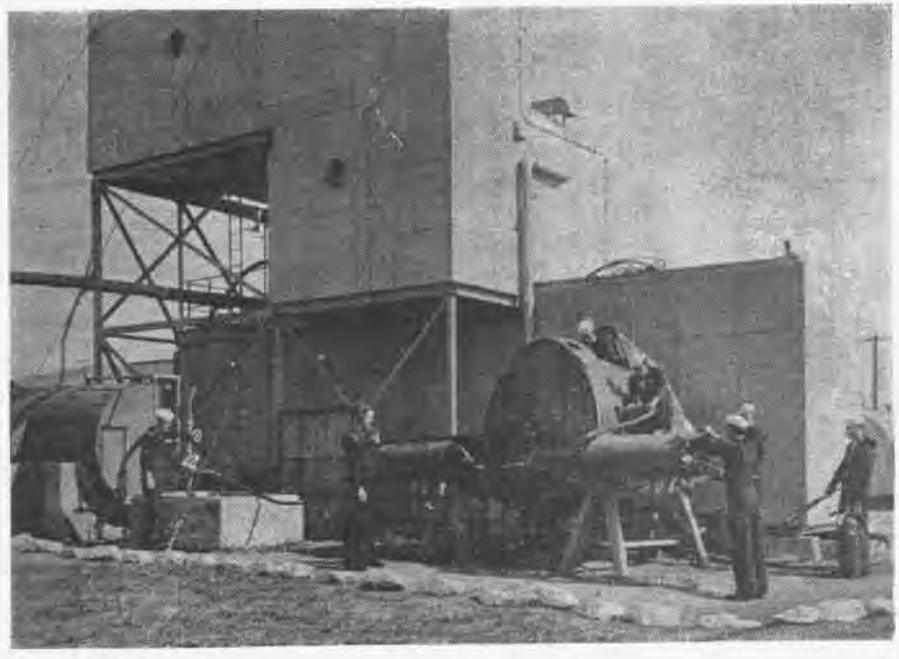
Prior to the war few ships made much use of their arresting gear and catapults. A carrier often would make more launches in a day than it would have had in a year in pre-war days because in peacetime it had plenty of time to turn into the wind and sufficient deck space for long take-off runs.

◆ **CATAPULT**
STUDENTS GET WORD ON H-2 CATAPULT

War required faster launchings, which in turn necessitated putting a lot of planes on the flight deck. Catapults had to be used because the take-off space was thus cut down. The fleet learned the value of catapults and by the end of the war some small carriers were launching 100 percent of their planes that way.

With the coming of the jet plane to carriers, new problems of deck operation will have to be solved. That jets can be catapulted was proved when NATC Patuxent River tossed a P-80 into the air. An FD-1 landed and flew off the long deck of the U.S.S. *Franklin D. Roosevelt* with plenty of space to spare. Existing arresting gear stopped the 8800-lb. plane without difficulty.

New barriers are being planned to work with tricycle landing gear types.



◆ **GASOLINE**
GASOLINE FIRES ARE DANGEROUS ON CARRIER SO STUDENTS LEARN ABOUT GAS SYSTEM

AFLOAT AND ASHORE

VP-123—This squadron is getting in a variety of training, both on the ground and in the air. This included extended day and night navigation flights, strafing, sleeve gunnery and night bombing attacks. All pilots and crews participated in flights to Midway.

On the return to Barber's Point the planes made night bombing runs on Necker island and participated in night radar interception with VF(N)'s from Night DevRonPac. RCM and evasive tactics were used during these interceptions and an area has been allocated south of Oahu for continuation of these problems. Ground school classes include code, blinker, semaphore, naval justice, PB4Y-2 hydraulics, electronics and structures.

VP-102—This command claims distinction of being the first four-engine land plane to use the Truk air strip. A *Privateer* flew civilian Federal employes to Truk on an economic survey of the Carolines and Marianas. Landing on the strip was effected "without strain" before a large gallery of spectators. Length of the strip is 4,000' coral plus 500' unprepared. Prevailing surface wind usually is about 10-15 knots. However the strip is behind a hill from the wind so the "effective" wind is usually about eight knots.

NAS Quonset Point—Recent graduates of junior high schools in this vicinity who won honors in the field of science have been selected for a proposed tour of naval facilities here and the Sub Base at New London, Conn.

SecNav and ORI have given joint approval to the tour. Because of the importance science plays in the Navy's development and vice-versa, it is believed students and the Navy alike will be benefited by this operation.

Proposals now offer the honor graduates a one-night stay at Quonset including a chance to visit one of the carriers in this port.—*Quonset Scout.*

CAG-4—Pilots in this air group are doing more than just flying around these days. Demobilization and discontinuance of any allowance for any staff required appointment of 15 pilots to help with training and administration. They now handle the jobs of ordnance officer, aviation equipment, radio, radar, physical training, photographic, ACI, first lieutenant, welfare and recreation, training, transportation, engineering, safety, administrative and enlisted training.

VP-28—This squadron has stressed flight training to meet the shortage of aircrewmen. Long over-water navigational flights were flown almost every other day and special searches conducted. A masthead bombing flight syllabus was initiated, each plane carrying 12 100-lb. Mk 15 Mod 2 practice bombs. Runs were made on a derelict beached on a reef off Nasugbu, Luzon, P. I. Bounce, instrument and radio range flights were made, with each PPC acting as flight instructor for his PP1P's and PP2's. Pilots and aircrewmen also viewed aircraft anti-submarine warfare training films as part of their ground training.

NAS Pensacola—Release of Chief Photographer J. A. Pelter to inactive duty here recently recalls an incident when he tried to report for duty here in 1935 after spending two years as chief cameraman for the Byrd Antarctic Expedition. When he advised the station duty officer he was just reporting in after two years' leave that individual thought he was a mental case and sent him to the dispensary for examination. He convinced the medical men that he was perfectly normal and wangled three months' more leave—to go on a lecture tour.—*Gosport.*

NAS Lakehurst—After flying 300 miles to sea on a mercy mission, the blimp K-120 was unable to make the rescue when an ailing seaman aboard a merchant ship refused to be saved. A Coast Guard PBM which made the flight out also was turned down. The blimp lowered a life ring and the patient was put in a lifeboat but just as the ring was being fastened he refused to go through with it. He also refused to board the PBM nearby. The man died before the ship could get him to port.

NAS Seattle—A handful of tough, war-hardened Marines were called out on a special mission, Operation Dog Bite. Due to the abundance of mongrel canines aboard this air station, the devil dogs were assigned the job of reconnaissance and extermination. Working in the efficient manner they learned in the Pacific, there were no Leatherneck casualties. Not a prisoner was taken. Even the station's mascots, Smiley, Blondie, and Lassie are dead dogs.—*Sand Point Static.*

VR-5—People are living in almost anythings these days of housing shortages, from garages to Quonset huts, but this squadron had some boys who lived in an R5D at Adak, Alaska, for three days. Six crew members and 17 passengers lived on the plane for 74 hours when the station was quarantined for diphtheria. Everyone was comfortable with a telephone, radio and electric lights in the plane. A steady diet of sandwiches was rather monotonous, however.

VP-28—While at Tawitawi, Philippine Islands, recently, this squadron had an interesting mission—flying Jainal Abivin II, Sultan of Sulu, and six palace guards on a tour of islands. The tour started from Jolo Island, where he lived, and included Tawitawi. The squadron has been getting in gunnery practice by having one of its own planes tow the Mk 5 sleeve. Training also included search missions, air/sea rescue and advance base operations from the U.S.S. *Greenwich Bay* (AVP-41).

MAG-25—The headquarters squadron of this Marine Air Group has been changing over from R4D to R5C type aircraft, six of the latter planes being received during May while 12 R4D's were turned over to Fairwing One at Shanghai, ComFairWestPac at Guam and AirFMFPac at Ewa. Personnel also assisted MAG-32 in ferrying 47 SB2C type aircraft from Tsingtao, China, to Okinawa. Five R4D's furnished by MAG-25 flew with them and transported the SB2C crews back to China.

NOB Argentia—During the late war this bleak Newfoundland air base was swarming with aircraft, but now planes are such seldom visitors that a flag is hoisted to keep the personnel informed when a NATS plane is going to arrive. Three flags are used. A "Yoke" flag when word is received that 0106 has left New York. The "Negat" flag means the flight was canceled and the "Item" flag means it was delayed. The flag system is used to relieve NATS from the hundreds of phone calls from curious persons who wonder if that letter is coming or if that wife and child are on their way.

NAS Jacksonville—The air station had its first blackout in some time recently and there were no enemy planes in the area either. A downtown workman with a pneumatic drill pierced the electric power line, setting off a series of explosions and fires. He also stopped practically all operations at the station for about 24 hours, stopping fans, machinery, coke machines, movies and cooking stoves along with everything else.

VP-201—This squadron uses a system to indoctrinate its own personnel in various phases of seaplane tender operations. During joint training with AVP-51, the *San Carlos*, the squadron rotated its personnel so all familiarized themselves with tender operations and shipboard life. Rearming, refueling and repairs, as well as actual flights, were effected, using the tender as a base of operations.

MCAS Miramar—The auxiliary air station at Camp Kearney and the Marine Corps Air Depot, Miramar, have been incorporated and redesignated MCAS Miramar. At the same time MCAS El Centro was turned into a NAS. Miramar will base night fighters, transport and photo planes.

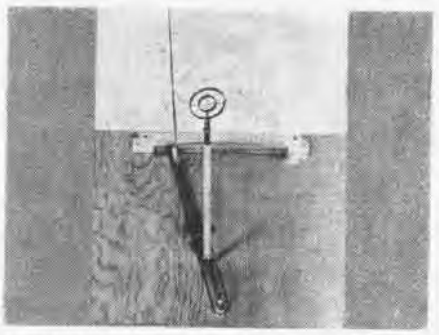
VRJ-1—This NATS squadron runs an engineering round table discussion twice weekly for all plane crews and engineering personnel. Object is to create more interest in maintenance problems, afford specific dope to new mechs and pilots and increase all hands' knowledge of R5D's.

NAS Patuxent River—A school to train 150 enlisted Waves who volunteered to stay on duty another year was set up by VR-1 and VR-3. They were taught the multiple duties of a NATS flight orderly.

TECHNICALLY SPEAKING

BOARD PLOTS ROCKET FIRING

MASTER PLOT BOARD SPOTS ROCKET HITS



DEFLECTION PLOT BOARD AIDS ANALYSIS

TO ELIMINATE the hit and miss method in scoring rocket rounds, a plotting board system has been designed for use by all the detachments in Aircraft Rocket Training Group One.

These plot boards greatly increase accuracy and speed in scoring hits. They are easily constructed, simple to operate, and efficient. Other training groups may find them useful.

The deflection plot board, located in deflection rake station, is aligned so that a line from the sight arm pivot point and scale reading ±6 will intersect the target bulls-eye. Likewise, the sight arm of the master plot board, located in range rake station, is aligned with the range station and bulls-eye.

In operation, the deflection spotter, noting hits through his sights, phones his scale reading to the master plotter. The master plotter sets this reading on the scale on the master plot board using the plexiglas deflection arm, by operating the master plot sight arm with his left hand, he spots the hit. The hit is read at the intersection of the starboard edges (viewing from pivot points) of the two arms on the master plot board.

Elliptical charts for 15, 30, 40 and 50 degree dive angle, 1,000 and 1,500 yards slant range are used with the corresponding dives and the master plotter reads the hit directly in mils normal to line of flight and at the various o'clock positions.

The following materials were used: ¾" plywood, various thickness of plexiglas, aluminum sighting arms, and MK.11 open rear ring machine gun sights. Miscellaneous bolts, screws, washers, etc., complete the assembly. The front sight was made from 3/16" bronze welding rod filed to a knife-edge for 6" on one end. It is screwed into the aluminum sight arm while the rear sight is mounted on a ¾" pipe with set screw for height adjustment.

The master plot board was laid out to a scale of 1" = 50 feet. Distance from pivot points of sight and deflection arms on master plot board are to scale and represent actual ground distances from rake stations to bulls-eye. The elliptical charts were made by photographing and enlarging (doubled) the ellipses on the old pilot score sheets. The charts are mounted between two sheets of plexiglas and held on plot board by four metal pegs. The 15, 30, 40 and 50 degree charts are readily interchangeable. The firing compass heading corresponds to a line from 6 to 12 o'clock on the chart in relation to the master plot board.

(DESIGNED BY LIEUTENANT (JG) R. P. CONEWAY, USNR AND V. H. GOLDMAN, ACOM, USNI.

Plane Stops Stop Hydro Leaks

VB-82—The Engineering Department of this activity has reduced the number of squawks on hydraulic wing folding device mechanisms on the SB2C, by forcing pilots to bring their planes to a complete stop when folding or unfolding wings. Previously this had been done while taxiing at a low speed to or from the parking line.

Because of this new system, in the past few months there has been a reduction of 90% in hydraulic cylinder leaks.

Nursing of the supercharger has also increased efficiency. Each plane captain desludges during the morning turn-up, and also each pilot before and after a flight.

Perfect operation has resulted since this procedure has been initiated.

▶*BuAer Comment*—The practice of stopping to fold wings is very good practice, not only to prevent excess strain on the wing fold mechanism, but also due to the small capacity of the hydraulic pump.

When the wings are folded while in motion, the hydraulic power to the brakes is insufficient to properly operate them. This results in numerous taxi crashes, which are eliminated when stops are made for wing folding and flap retraction.

FAW Uses Corks on Carburetors

FAW 8—This command has reworked several hundred Stromberg Injection Carburetors according to the method outlined by the Commander Air Force Pacific in Technical Bulletin 163TB-45 for attaching cork pellets to the metal hangers.

A sufficient number of aircraft thus modified have operated under local observation to evaluate the rework as satisfactory. It is also believed that this method is superior to the Army system, both as to rigidity of the cork and ease of fabrication of the attaching parts.

Cork pellets reduce the cost of repair from $2.75 and $2.30 for rolled seam floats to two cents.

At overhaul no elaborate anti-leakage test is required since overhaul procedure could specify 100% replacement of the pellets.

▶*BuAer Comment*—A revision to GEB 70, describing the Army system, is in process and should be in the field shortly.

EXPLODED VIEW OF JIG USED IN REWORK

PRECISION 'CRAB' MAY FIND MANY USES

New 'Crab' Is a Precision Job

Special Devices Center, Office of Naval Research, has given Navy acceptance to a quantity of precision recorder "crabs," interchangeable with standard Link trainer "crabs" and particularly adaptable to any requirement where precision recording work would be necessary.

It is expected that these crabs will find use with operational flight trainers and are being experimented with to determine use in other varieties of training equipment. They are slightly heavier than standard crabs, but have several improved features like an enclosed inking guide and variable speed regulator.

Any activity having requirement for such a device or desiring further information about it can communicate with the Center at Port Washington, Long Island, referring to Device 14-M-2, Mk 2.

BuAer Has New Hydraulic Fluid

A new hydraulic fluid which may be the answer to hydraulic fires such as downed the *Constellation* has been developed by BuAer and made available to the Civil Aeronautics Administration for use in commercial planes as well as Navy.

The fluid, BuAer Spec. 51-F-22AER, is being specified for all new Navy planes. It was tested by CASU-26 at Brunswick, Me., on F4U-4's and favorable reports received. Tests also were made at Naval Research Laboratory and NAF Philadelphia.

A water base gives the new fluid its fire-resistant qualities as compared to present petroleum fluids. It also is reported to be more efficient from a maintenance standpoint because of its better effect on packing, producing fewer leakage problems.

Tests are being made at present with the fluid in 3,000-lb. high-pressure hydraulic systems such as are on the AD-1. Earlier tests were on the 1500-lb. systems.

F8F Trouble Is Traced to Filters

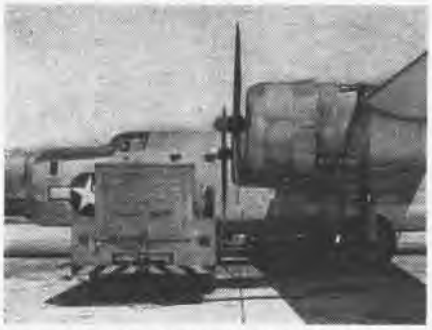
VF-20—This squadron's operating experience has shown that filters on gas trucks should be checked often for dirt and rust to avoid engine troubles.

Two F8F-1's attached to the squadron made emergency landings with their engines cutting out. Trouble was traced to the fuel system of the planes. An accumulation of rust and dirt was found in the fuel systems of more than half of the planes in this command. It was found that gas truck filters were excessively dirty and rusty.

Squadrons having *Bearcats* should be cautioned not to hang chocks on the side strut assembly of the landing gear. On this assembly there is a hydraulic line to the brakes and an electrical lead to the micro-switches which control the automatic cowl flaps and wheel indicators. If chocks are hung on the assembly, they either will pinch the hydraulic line or damage the electrical lead.

Preserving Mix Meets a Problem

Hedron, Fairwing 8—This squadron has developed a procedure for using AN-VV-C-576A Type I preserving compound together with used engine oil in



TRUCK PUMPS PRESERVATIVE IN ENGINES

aircraft power plants for preservation of new or used planes where Type II compound is lacking.

General Engine Bulletin 38 revision 1 specifies that Type I can be used in a ratio of three parts oil to one part compound and components thoroughly mixed prior to engine run-up. T.O. 96-45 specifies that the oil system shall be drained and engines serviced with the Type II compound (ready mixed).

Since the latter type was unavailable, this command used the following system of preservation with the Type I:

Oil in the engine sumps was drained. Oil in the tank was measured with the "stick" provided. The special truck (see photo) pumped an accurately measured quantity of compound into the oil tanks. A permanent crew was assigned to assure uniformity and accuracy of operations, using a reworked standard oil truck.

The mixture was agitated for an hour by the truck circulating pump. To insure complete blending, it is essential that the return oil be returned to the tank outside of the hopper.

▶ ***BuAer Comment***—**Hedron 8's procedure is very satisfactory, particularly the method of obtaining the correct mixture of Type I with the engine lubricating oil. The Type I compound by itself is inferior to the compound-lubricating oil mixture as a lubricant and is also likely to give trouble by fouling spark plugs due to its higher ash content. Properly blended, the compound-lubricating oil mixture is satisfactory if the precautions of T. O. 48-43 are observed.**

Device Teaches Weight, Balance

ORI Trainer Shows Stowage Technique

To teach Navy personnel principles of distributing heavy cargo in an aircraft, a simple but effective weight and balance trainer has been designed by Special Devices Division of ONR.

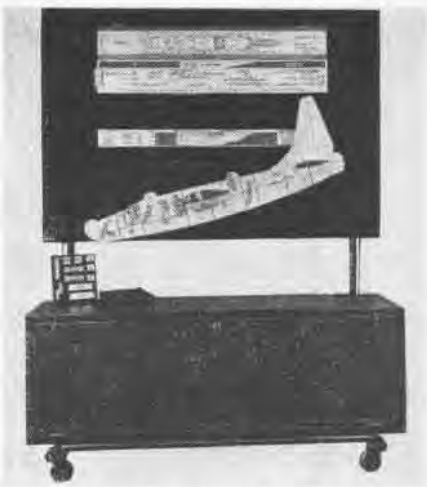
The trainer consists of a panel supporting a plywood profile of a PB4Y-2 and shows the position of its center of gravity. Pins upon which small weights may be hung are extended at the centers of the various compartments.

Weights made of lead are shaped to represent bombs, fuel, oil, ammunition or other cargo. These weights are proportional to the weight of the model plane so that all calculations showing the center of gravity under various load condition are accurate to a high degree.

By means of a chain drive operating a rack and pinion gear assembly, an instructor can cause the model to be supported at any point along the mean aerodynamic chord. A second chain drive simultaneously operates the trim tab, elevator and a counterbalance.

Movement of the center of gravity is increased by 15 times and indicated by a pointer on a scale just above the model. A four-foot model of a load adjuster slide rule mounted at the top of the panel is used to check results obtained on the trainer.

The trainer, now undergoing tests at NATTC Memphis, can be applied to all types of heavy aircraft. It requires no power supply for operation. The device, with any model multi-engine aircraft, may be obtained through the Office of Naval Research, Special Devices Division, Port Washington, N. Y.



MODEL SHOWS LOADING ON A PRIVATEER

Winter Gear Too Bulky For F7F

VMF(N) 533—Cold weather operations with the F7F-2N showed that the standard wool shearling winter flying suit was far too bulky and restricted both as to movement and circulatory efficiency for winter use in this plane.

With temperatures dropping to minus thirty degrees centigrade in the North China Area it was necessary for pilots and radar operators of this squadron to wear winter flight gear in order to remain warm.

The opinion of these men was that a lighter weight, more supple flying suit as well as a more efficient heating system would be more desirable.

▸ *BuAer Comment*—There has been a complete redesign of winter flight clothing. The new design will consist of a windproof fabric outer shell lined with alpaca pile, wool pile or some of the synthetic fibers.

Outfits will be composed of several layers of garments which may be taken off or worn at will according to the temperature prevailing at that particular time.

New 'Mop' Speeds Up Swab Job

NAAS CABANISS—Improvements on the standard-type squilgee for scrubbing down hangar decks and ramps have been made at the air maintenance unit here. The new squilgee, 24″x5½″ x1¾″, saves 50% of the normal manpower in scrubbing down, as the old type was found to be inefficient with respect to both material and design.

Maple, a hard, close-grained wood, is used to insure against cracking, while ½″ sheet rubber (stock R-33-S-355-75), more pliable than original rubber used in the squilgee (stock ♯38-S-400), does a better job and covers a larger area.

About two man-hours are required for making 12 of the 24″ squilgees. The handle (stock ♯38-H-325), stocked at the present, is used with squilgee made by this unit.

Honing Device Wins Big Award

NAS SAN DIEGO—Largest beneficial suggestion award ever received on this station went to Robert W. McClure when he received $925 for an idea to hone airplane engine cylinders.

McClure's idea saved an estimated $197,652 annually by a device fitted and adapted to contoured bore cylinders. Formerly it was extremely difficult to hone cylinder interiors, which either were smaller in circumference at the top or had an hour-glass shape. McClure's device has thin honing blades so set that they reach all the interior surface.

A former enlisted man on the *New Mexico*, McClure worked on his idea since October, 1942. He received a $250 award for another idea in 1945.

CAPT. GEHRES PRESENTS McCLURE CHECK

Marines Solve Problem in China

VMF(N)-533—This squadron has adopted a cockpit hood for simulated instrument flying in F7F-2N's that is proving quite satisfactory in lieu of colored plastic hoods and goggles which have not been here at Nan Yuan airfield in China.

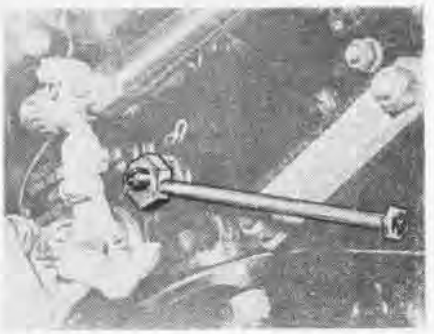
CLOTH HOOD IN PLACE ON MARINES' F7F

It was made by the parachute department out of lightweight white cotton cloth. Its overall length is 36″, with a total width of 48″ at its forward end. The forward end is sewn so that a drawstring may be inserted in the hem to draw the hood tight around the gunsight and instrument panel.

After being drawn tight, it is secured to the gun-charging handles, with the pilot placing his head under the aft end of the hood. His natural position keeps the hood taut. Once in place the hood can be removed instantly by a flip of the hand if it is necessary to return to contact flight. In use, it gives unobstructed view of all instruments and controls.

Probably the greatest advantage of this type hood over colored plastic shields is that it does not partially obstruct contact vision as do the plastics. This is particularly valuable in Peiping area where haze and dust frequently cut visibility to only a few miles.

▸ *CNO Comment*—It is not believed the new amber shield on the windshield cuts vision; rather it is beneficial to penetrate haze. Amber filters are used photographically expressly for that purpose.



DEVICE IS CLAMPED ON THROTTLE STOPS

Tool Does Throttle Adjusting

NAATC JACKSONVILLE—A tool was designed at this station that facilitates the adjusting of carburetor throttle stops. A difficult operation with a screwdriver, due to the inaccessibility of installation, the instrument has proved invaluable as a time and effort saving device.

The tool is made by drilling and tapping a ⅜″ check nut (AN 316-6L) to fit a ¼″ x 1/32″ bolt (AN 3-20).

The nut is slipped over throttle stop adjusting lug and the bolt tightened. The bolt is then used as a lever to make adjustment.

▸ *BuAer Comment*—The idea is good. However, the illustration indicates that the tool is clamped onto the eccentric portion of the throttle stop, thus preventing adjustment of the idle stop while engine is running.

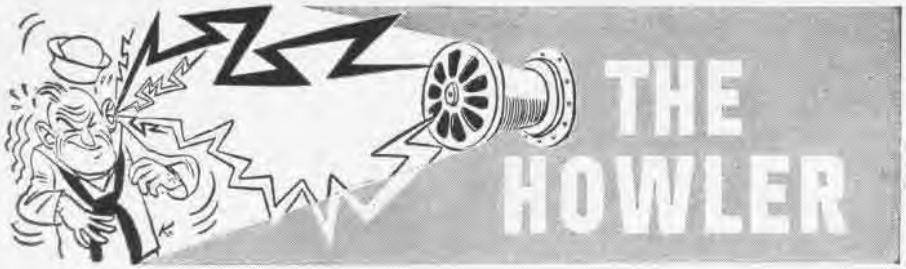
It is suggested that a redesign be attempted which will permit tool being applied to the outer end of stop (¼″ section). If this can be done, it will not be necessary to advance throttle to position shown when adjustment is made.

[DESIGNED BY W. M. SCHMAUDER, AMM1c]

Tow Bar Yields JRB Tail Wheel

MAG-31—Difficulties in procurement of JRB spares left a plane with a flat tail wheel tire on blocks for several weeks until the Headquarters Flight Section of MAG-31 discovered an old tow bar with F4F pneumatic tail wheel tires. At first it was thought that the tires could be exchanged as the wheels were almost identical. The rim sizes and tire diameter, however, were not the same. Consequently it was decided to substitute tail wheels. This required the addition of a bushing to the tail wheel so it would take the ⅜″ axle. Although the new bushing is made of unplated steel, proper lubrication should prevent corrosion. The installation has been satisfactory but will be exchanged as soon as a JRB tail wheel tire and tube are available.

▸ *BuAer Comment*—This is considered satisfactory. Both wheels have about the same load limit, and in view of the location the squadron's ingenuity is commendable. However, the change to proper wheel as soon as it is available is recommended.



Evaluation of Overhauled R-2600-20 Engines. The Bureau of Aeronautics, acting on a report received from COMAIRLANT that the power available from overhauled R-2600 engines seemed to be less than the power available from new R-2600 engines, initiated a program of testing and evaluation of overhauled engines at the Aeronautical Engine Laboratory, Naval Air Material Center, Philadelphia.

The test program was begun with the shipment of the first overhauled R-2600-20 engine to NAMC on 17 September 1945. Five others were shipped at intervals of approximately a month, making a total of six engines for testing purposes. Each engine as received was fitted with the same torquemeter reduction gearing and calibrated carburetor, and was tested on the same dynamometer under controlled standard sea level conditions.

The table below gives a comparison of results obtained from a new engine and the average results obtained in testing the six overhauled engines at take-off power under sea level conditions in low blower:

TAKE-OFF (2800 RPM)

	New Engine	*Average Overhauled Engines*
B.H.P. (const.)	1900	1900
Air Flow	13500	13550
Manifold Pressure	46.0	46.9
F/A (const.)	.097	.097
S.F.C.	.69	.691
Mixt. Temp. °F	144	142
Throttle & Mixt. Control	PT-AR	PT-AR

A study of these figures reveals that it was necessary to increase the MAP slightly in the overhauled engines in order to obtain the take-off rating of this engine. The air flow and specific fuel consumption also registered a slight increase.

The engines were also tested at the F/A produced by the carburetor as received from overhaul. The results are as follows:

TAKE-OFF (2800 RPM)

	New Engine	*Average Overhauled Engines*
B.H.P. (const.)	1900	1900
Air Flow	13500	13926
Manifold Pressure	46.0	47.7
F/A	.097	.1036
S.F.C.	.69	.735
Mixt. Temp. °F	144	135
Throttle & Mixt. Control	PT-AR	PT-AR

An analysis of these values indicates that it was necessary to increase the MAP considerably more where overhauled carburetors were installed, in order to obtain 1900 HP, the take-off rating of these engines. Air flow and specific fuel consumption also increased proportionally due to the richer mixture strengths.

Conclusions:

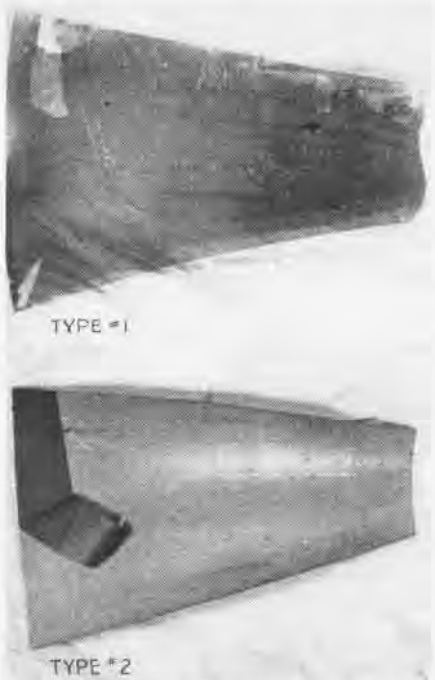
1. These tests show that an R-2600-20 engine equipped with a new carburetor delivers considerably more power at its T.O. manifold pressure of 49" Hg than its take-off rating of 1900 H.P.

2. Activities operating overhauled R-2600-20 engines should use 49" Hg at take-off to compensate for any slight decrease in power available and to insure a minimum of 1900 H.P. with rich limit carburetors.

3. Stations should make every effort to improve their present carburetor overhaul procedures since this testing program shows a much greater decrease in power available when overhauled carburetors were used.

Plexiglas Panel An activity operating PBY-5 aircraft reports that plexiglas panels have been received for the past year in a condition which makes them practically useless because of the types of protective coverings used. The accompanying photograph shows panels for the waist gunner's turret with two types of unsatisfactory coating. Type 1 is not satisfactorily protected from scratches and abrasions. The coating peels and rubs off easily, exposing plexiglas to damage. Type 2 is protected with paper laminated with a tar-like substance which cannot be removed without great difficulty. Paper separates at laminations and leaves black tar-like substance adhering to plexiglas.

The reporting activity recommends that panels be protected with Spraylat "A," Stock No. (1)52-c-4300, or equivalent, and that the coating be sufficiently thick to protect the plexiglas from scratches and abrasions and to allow even and complete removal by peeling. The activity further recommends that for maximum protection and ease of removal by peeling, a piece of very coarse cheese cloth be placed over the plexiglas, and Spraylat "A" be applied heavily over the cheese cloth.



COATINGS FAILED TO PROTECT PLEXIGLAS

The contractor, Consolidated Vultee, reports that the condition complained of has probably been caused by aging or by storing near heat, and that removal may be accomplished without difficulty by applying iso-propyl alcohol with a rag and rubbing slightly, giving special attention to the edges. The present Spraylat coating technique used by the contractor is believed satisfactory.

BUAER is investigating transparent plastics currently in stock to determine whether any other manufacturer's products are similarly affected. Specification changes will be initiated if necessary.

POOR SCREW-IN FAILS TO HOLD ELBOWS

Elbow Union Trouble. Incorrect alignment of the accelerating pump discharge tube with the elbow when the tube nut is tightened can cause trouble, as it did with one R-2800-8 engine at a training activity.

In this cases the union broke completely off at the regulator body, discharging raw gas and creating a dangerous fire hazard. The activity said undue stress was put on the bronze elbow (AN790-5) when the carburetor was assembled because the steel discharge tube wasn't lined up correctly when it was screwed in.

Close inspection by manufacturer and overhauling activities at the assembly was recommendation to correct alignment of the tube and elbow before tightening the tube nut.

Some inspectors at the 30 hr. check test tightness of the lines by pulling on them. This line is easily deformed, sufficiently to place an abnormal strain on the elbow. A supporting clip might be installed at or near the midpoint of the line to prevent deflection and vibration of the line.

NAS JACKSONVILLE—This station took drastic steps to improve the military appearance and conduct of its personnel—it declared Saturday mornings to be work periods instead of holidays. Department heads and division officers indoctrinated and inspected their men in requisites of conduct and appearance. The campaign was brought about by sloppy and improper wearing of Naval uniforms, failure to salute and laxity in care of government quarters and property.—*Jax Air News.*

OIL DRUMS HAD TO PINCH-HIT FOR LUMBER IN THIS INGENIOUS NOSE HANGAR FOR PBM MAINTENANCE AT OPERATION CROSSROADS

ATOMIC AIRLINES

THE PLANES were ready to fly on schedule. The "VIP's" got where they wanted to go. The technical missions were performed as directed. Search and rescue coverage was provided. Everyone in *Operations Crossroads* took this efficient air service for granted, but Task Unit 1.6.3, which did the job, sometimes felt like the proverbial one-armed paper hanger.

Task Unit 1.6.3 of Joint Task Force One consisted of VH-4 and VP-32 supported by CASU(F) 34, NAB EBEYE, and the U.S.S. *Orca* (AVP-49). Fifteen PBM-5E's could hardly be called upon to perform so many varied missions as fell to the lot of this task unit—but the record speaks.

On Able Day VP-32 had six of its nine planes performing technical missions such as photography, radiometry, radiological reconnaissance, and damage estimation; and on Baker Day, eight planes. VH-4 provided search and rescue coverage on these tests as well as on all air rehearsals, using five of its six aircraft.

Operating 80 to 90 percent of the aircraft of a unit on a particular day calls for superb maintenance and a continuous state of high mechanical efficiency. On every occasion every plane was in the air and on station at the appointed time.

There are no landplane facilities at Bikini, and this task unit provided the only air outlet for JTF-1. Reliable transportation was absolutely essential to the success of the operation. It was no new problem to the two squadrons, for VP-32 had for several months previously operated air shuttle service between Saipan and Truk, while VH-4 had been doing the same thing in Japan.

By 20 March 1946 the two squadrons were at NAB EBEYE, three miles north of Kwajalein, and on that date reported to CJTF-1 for duty. At this time VH-5, later decommissioned, was based at Ebeye, and there was not enough space on the parking apron for all planes. This was remedied by clearing away additional areas on the flat coral "rock." Tie-downs for the planes were provided by digging holes in the coral, sinking buoy anchors in the holes, and filling in with concrete. There was only one ramp left on the base by the Japanese, and with the large volume of operations it was no small matter to keep that ramp in continuous service throughout *Operations Crossroads*.

ONLY ONE cleat-tractor was available for moving, launching, and recovering aircraft. With coral dust, salt spray, and high humidity, this one tractor naturally balked at times. On several occasions two or three pieces of heavy rolling stock were hooked up in series to launch and recover planes. The tractor problem was typical of the difficulties caused by slow and inadequate supply. Ultimately, another tractor was procured from the Army on Kwajalein. Masters of the jury rig, Task Unit 1.6.3 demonstrated its ingenuity.

SYMBOL OF CROSSROADS IN EBEYE SIGN

VH-4 GAVE WORD ON RESCUE PROCEDURE

PERSONNEL shortages, the natural result of the period of reconversion from war to peace, hit the units comprising the seaplane organization of JTF-1 particularly hard. They averaged 70 to 80 percent turnover. Operations were so heavy and conditions so unfavorable that an adequate training program was impossible. Fortunately all units were blessed with an experienced nucleus of personnel, and the privilege of participating in the atomic experiments spurred the newcomers to qualify.

Maintenance of the aircraft of these two small squadrons, although of microscopic concern among the imposing problems in the broad plan of *Operations Crossroads*, nevertheless had the importance of a vital link in a chain. The PBM-5E's had a job to do, and CASU(F) 34 had to see that they were able to do it. This service unit arrived on Ebeye from Eniwetok on 25 February with 150 men and 6 officers. The personnel of the unit had been working on the maintenance of fighter aircraft and were familiar with the PBM only as a seaplane which they had been exposed to in recognition courses during training. With the burden of upkeep thus placed on the shoulders of a few key men, the squadrons pitched in to perform a large percentage of the maintenance of their own aircraft.

It was evident on arrival at Ebeye that resourcefulness would play a big part in meeting all the demands placed on the planes. Most of the equipment on the island was in bad shape. Casters on the two available workstands were frozen solid by corrosion. Even when repaired the workstands were found to be inadequate, and it was necessary to improvise from old Japanese stands found in the scrap heaps. A crude engine hoist stand was contrived from chain falls borrowed from a ship in the lagoon and from small sections of "I" beams found in a scrap heap on Kwajalein.

A propeller stand was made by welding two large truck wheel drums together and mounting this assembly on a 4½-inch pipe as a springle. Air compressors were put together piecemeal as essential parts left behind by Seabees and Japanese could be uncovered.

Most ingenious of all the jury rigs was a very adequate nose hangar built from oil drums! (see lead photo.) Approximately 2,000 oil drums were stacked to form a platform for the flooring, a substantial substitute for the lumber which simply wasn't there. A wooden frame made of 2 x 6 planks covered with heavy canvas formed the overhead, affording shelter for maintenance crews during bad weather. Twelve-inch flood lights were mounted in the four top corners of the hangar, making it possible to perform engine changes and scheduled checks 24 hours of the day. Since there were 12 engine changes during the operations, it's evident that the improvised nose hangar saw plenty of use.

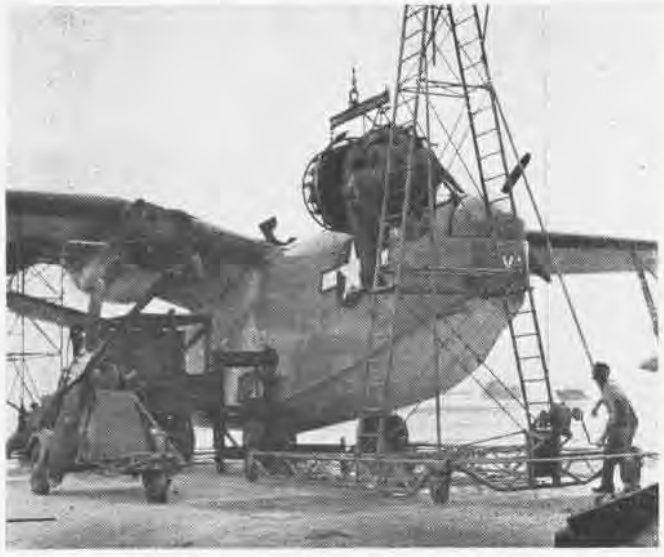
A few of the features which helped to increase the output of maintenance crews included an overhead trolley designed to eliminate the need for moving planes while changing propellers and engines, a self-centering nose in guide track to facilitate placing the planes in the hangar, propeller stands built in the hangar at engine level to obviate the need of lowering props to the ground after removal, oil drain equipment, electrical power outlets for special machinery, and tools required for doing all work performed.

PREVENTION of corrosion is one of the greatest problems in this area where the average relative humidity is above 85 percent and salt spray and coral dust are constantly blowing across the island. Due to the small capacity of the fresh water evaporators it was necessary to collect rain water in oil drums and discarded bomb bay tanks in order to give the aircraft an occasional wash down with fresh water. For lack of such facilities as kerosene sprays, steam pressure equipment, and degreasers, many extra man-hours were spent in the fight against corrosion.

Washing down the planes, incidentally, was not the only laundry problem aggravated by the water shortage. Clothing suffered too. Ingenuity extended to personal needs also, for the large windmill washing machine rigged by VP-32 worked efficiently.

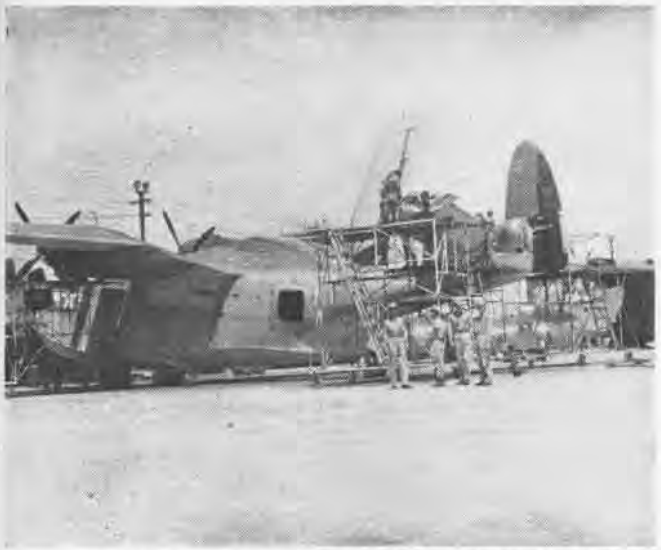
Without the diligence and conscientious effort of CASU(F) 34 combined with the hard work of the flight crews, a daily average of 84 percent availability, in addition to 100 percent availability on rehearsal and test days could not have been attained.

The seadrome areas at Ebeye and Bikini are far from ideal for heavy load operations. Early in the operation winds were invariably easterly with an aver-



MECHS FIND JURY RIG HOIST USEFUL IN PBM-5E ENGINE CHANGE

SECRETARY OF THE NAVY FORRESTAL CHATS WITH CREW MEMBER



STRUCTURES OVERHAULS THE TAIL SURFACES OF A FLYING BOAT

FLIGHT CREW VIEWS ATOM BLAST FROM AFT STATION OF MARINER

age velocity of fifteen knots; however, as the volume of traffic reached its peak in June and July, the doldrum area incidental to the inter-tropical front moved into the Marshalls. In Kwajalein and Bikini lagoons there is always a considerable ground swell which, when combined with slick water, makes take-off and landing a tricky problem.

On Baker plus four day and for the next five days it became necessary to make open sea landings in the channel south of Bikini lagoon because of radioactivity in the lagoon. Very light winds and moderate swells were encountered, but power stall landings and JATO take-offs were made easily.

With deck turrets, armor, and APQ radar bombing gear removed from the aircraft the basic weight of the PBM-5E is approximately 34,000 pounds. On the runs from Ebeye to Bikini planes carried 1,200 gallons of gasoline which allowed for the round trip with ample safety factor for single engine operation. Normally transport planes carried a crew of nine. Thus, limiting the initial take-off load to 56,000 pounds, the aircraft were allowed a pay load of 13,000 pounds. Ordinarily the passenger load was limited to 20 persons. Mail, which was one of the main items carried on these flights, is very bulky cargo per unit of weight, and it was determined that due to space limitations 3,500 pounds was the maximum.

With maximum mail and passenger loads there remained 4,500 pounds of pay load weight which could be used for items of high priority cargo. Normally, however, the maximum pay load could not be carried because of lack of space. On one occasion a plane carried 3,000 pounds of goat feed for the experimental animals at Bikini; other equally unusual items of cargo were transported from time to time. Since it was found that heavy items endangered the decking in the aircraft, decks were reinforced with ¾-inch plywood which strengthened the decking without adding much weight.

The normal schedule between Ebeye and Bikini was two round trips daily. Additional planes were constantly standing by, however, and extra flights were the rule rather than the exception. Schedules were arranged to connect with flights by the *Green Hornet*, NATS and ATC from Kwajalein. Throughout the operations Task Unit 1.6.3 made 417 transport flights carrying 3,512 passengers, 422,935 pounds of mail, and 293,848 pounds of freight.

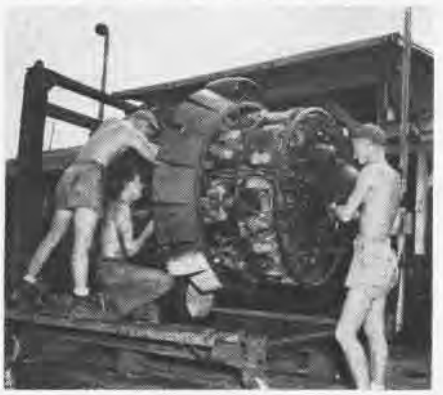
It is doubtful if any unit has ever carried so many "VIP's" in a comparable period. Passenger lists included the Secretary of the Navy, senators, congressmen, the President's Evaluation Committee, top ranking Army and Navy officers, and some of the nation's leading scientists. "VIP's" to the squadrons meant not only "very important persons" but also "very interesting persons." CJTF-1 had an air priorities office on Kwajalein which issued priorities on passengers, mail, and freight, and, in cooperation with NAB Ebeye, arranged boat transportation between Kwajalein and Ebeye.

Although the transportation duties of Task Unit 6.3.1 were intensive, only nine of the unit's 15 planes could be used for this work. The others were earmarked for other types of action. One PBM-5E was equipped with 5,000 pounds of radiation equipment. Others were rigged with photography, television, and radiological gear. It was definitely not routine, humdrum work. One patrol plane, for example, was assigned the mission of getting closer to the scene of the explosion, immediately before and after, than any other plane. This crew made the first flights through areas which might have contained lethal rays. The instruments aboard determined that the coast was clear for others to follow.

The U.S.S. *Orca* (AVP-49) was based at Bikini and acted as the terminus for air transport at that end of the line. She also based the search/rescue planes at Bikini and provided emergency repairs for planes downed by discrepancies. The *Orca* will long remember having a plane with a bad engine stuck in the lagoon the day before the second bomb explosion. She effected emergency repairs, and the plane, at the last minute, got into the air with a minimum load by the help of JATO.

Operations Crossroads proved beyond doubt the value of the PBM as a general purpose aircraft in areas where landplane facilities are not available. Task Unit 1.6.3 proved the effectiveness of ingenuity and imagination in operating from poorly equipped, isolated bases. The accident record is clean. All hands connected with seaplane operations at Bikini can be justifiably proud of the accomplishment.

SERVICE UNIT MADE 12 ENGINE CHANGES



BuAer Cuts Down Gear Included in Its Life Rafts

EXPERIENCE is supposed to be a great teacher and the Navy found out after four years of war in the Pacific that it was including a lot of stuff in its life rafts and survival kits that was of limited usefulness to downed aviators.

THIS PICTURE SHOWS GEAR ELIMINATED FROM MK-7 LIFE RAFTS

A study was made of search and rescue reports to find out what kind of signaling devices were most successful and what gear in the rafts helped most in keeping ditched pilots and aircrewmen alive. (NANEWS, October, pg. 21.)

As a result of this analysis, a sizeable list of survival items have been eliminated, or the quantity included reduced, from life rafts. T.O. 29-46 directed that action be initiated at the earliest practicable date to insure that only equipment listed in it be stowed in the PK-1 pararaft kits and multi-place life rafts.

Articles ordered deleted were:

PK-1 kit-repair kit, desalting kit, two sets of leak plugs, six safety pins, two books of matches, two cans of rations, one projector kit and one survival booklet.

MK-2 life raft—fishing kit, fishing spear, raft repair kit, leak plugs, four cans of rations, projector kit, head nets, survival booklet, navigation charts, plastic drinking cup, eight Mk 1, Mod O distress smoke signals, two cans of drinking water.

MK-4 life raft—fishing kits, fish spear, raft repair kit, leak plugs, eight cans of rations, distress smoke signals, projector kit, head nets, survival booklet, navigation charts, plastic drinking cups, four cans of water.

MK-7 life raft—fishing kits, fish spear, raft repair kit, leak plugs, 14 cans of rations, distress smoke signals, projector kit, head nets, survival booklet, navigation charts, plastic drinking cup, seven cans of water.

Life rafts still will include rations, although not in such a large quantity as before. Solar stills will replace cans of water, which sometimes rusted. A different type of day-night distress signal, comprising a flare in one end and smoke in the other will replace the former smoke signal.

Plane Has All Comforts of Home

NAS JACKSONVILLE—The VM unit here has a ready plane in operation which, it is believed, solves many problems encountered in the operation of such aircraft.

The type plane used is an SNB-1. The radio equipment includes an RU-GF installation which is used for communication with the tower. An ATC transmitter and an ARB receiver are used on the crash frequency. An ARC5 VHF installation is used to supplement the ATC-ARB at times when static is too heavy to permit successful operation on 4790 KCs.

The forward bomb bay is used to carry four flares for night work. The plastic nose of the plane carries a lookout with binoculars.

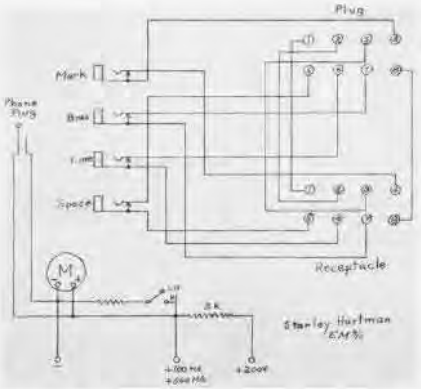
Meter Tests Teletype Circuits

NAS SEATTLE—An electrician's mate at this station has developed a universal teletype test meter to meet the need for a positive and quick method of determining the electrical condition of the teletype machine.

Using this meter it is possible to read the line, bias and magnet current in the machine if it uses a demountable relay such as the Western Electric 215 or 255 type. It is only necessary to remove the relay, insert the plug in the relay receptacle, and place the relay in the receptacle on the test meter box. By inserting the meter plug in the proper jack it places the meter in series with the circuit on the jack to measure current in that circuit.

It is also possible to use the meter in the loop jack of type 90B2 repeaters, which permits adjusting the loop current of these repeater circuits.

(DEVELOPED BY STANLEY HARTMAN, RM3MC)



HOOKUP FOR SEATTLE TELETYPE TESTER

▶ *CNO Comment*—**The need for this test equipment is negligible. The teletype line current does require checking occasionally but it is usually run through one or more series jack in the teletype table or elsewhere where line current measurements can be made easily. When necessary to test internal circuits of a teletype it can be made with any DC voltammeter by opening the circuit at a terminal block.**

Squadron Does Own Maintenance

VP-28—The engineering department of this squadron recently took over complete maintenance of its nine PBM-5's, using shop equipment of CASU(F) 58. An engineering crew was organized from men of NAB SANGLEY POINT, FAW-10, Flag Utility unit and the squadron. Work done in the shop for each of these units passes through one progress chief.

Each shop is divided into engineering, structures, electronics, ordnance, metal welding, carpentry, and paint shops. Flight crews of each plane do maintenance except strictly shop work.

NORFOLK STOCKPILES FUSELAGES, WINGS

Norfolk Melting Pot Kept Busy

NAS NORFOLK—The spare parts recovery program generates about 300,000 pounds of aluminum scrap weekly from wings and surfaces which are smelted into ingots for sale by the Supply Department.

After the A&R Department removes from the airplanes all needed components, as determined by ASO on a Navy-wide basis, the fuselages and wings are stock-piled.

These wings and fuselages are then dismembered by the use of acetylene torches and further reduced to a size suitable for smelting by shears. Molten aluminum is poured into the molds where it hardens into ingot form.

DISCIPLINARY CASES WORK ON SALVAGING

An interesting feature of this operation is the employment of enlisted personnel assigned for retraining to the Disciplinary Barracks in some of the above functions which greatly reduces the cost of this operation to the Navy and at the same time provides valuable training as cutters and melters.

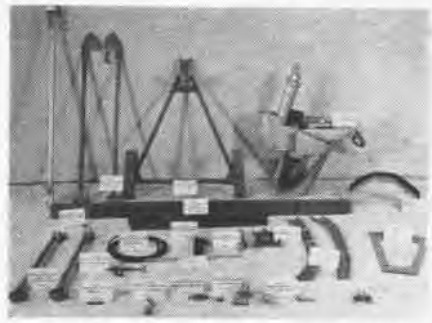
NAS SAN DIEGO—This station is turning out aluminum ingots at the rate of 12,000 to 14,000 pounds every eight hours. Residue parts from stricken planes beyond economical repair, production scrap from A&R, as well as condemned aircraft are fed to the scrap yard's reverberatory furnace.

From January to April of this year, 3,591,000 pounds of scrap was received by the Yard, of which 3,216,000 pounds was either transferred or sold.

During March, 2,554 tires were processed in the tire and rubber salvage section of the Supply Department. In the first three months of this year, 130,000 pounds of airplane, truck and passenger car tires was received for disposition. Over 100,000 pounds was transferred or sold.

SNJ Aircraft For Carrier Use

NATB PENSACOLA—Manufacture of 75 sets of parts to convert SNJ-type planes for carrier use has been completed by the A&R department. Since Pensacola had never previously made a complete carrier conversion, the order was a large one. NAS NORFOLK SNJ-3 Local Change No. 2, including drawings, was used in doing the job.



PARTS COMPLETED FOR SNJ CONVERSIONS

Tooling was one of the first steps in the process. Master layouts and reference layouts were made of all large assemblies. Tooling consisted of weld jigs, assembly jigs, sleeve type nibbler jigs, drill jigs, installation jigs, flat templates and form blocks. All tooling was completed in three and one-half weeks by A&R department.

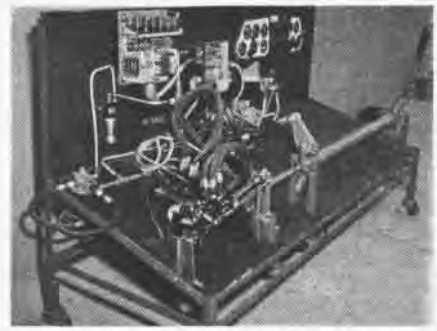
Production of parts was started as soon as each tool was completed. Typical operations called for one or more of these processes: flat template transfer, power shearing, sawing, grinding, nibbling, drilling, punching, deburring, drop hammer operations, milling, braking, rolling, hand forming, countersinking, spotfacing, welding, anodizing, heat treating, sand blasting, plating and paralkatoning.

The original order for 45 conversions received on 8 October 1945 was increased to 75 on 5 November. The total order of 75 sets was completed by 15 January 1946.

Scraps Make Auto Pilot Trainer

MCAS EL TORO—Built entirely of scrap parts taken from salvage at this base, an automatic pilot training panel now familiarizes aircraft mechanics in operation and maintenance.

The new teaching aid employs a General Electric C-1 automatic pilot (Mod-26J1a1) complete with flight instrument panel, inverter, amplifier, main J-box, servo units and electro-hydraulic transfer valves. A standard pilot's control stick and torque tube assembly are mounted on the semi-console type stand, giving the mock-up realism.



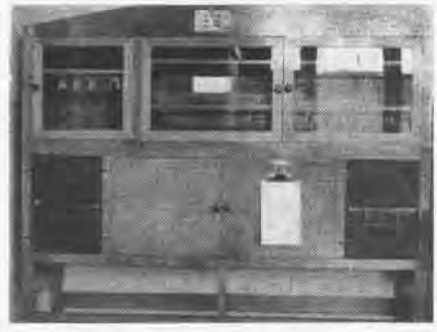
PANEL HELPS MECHS SERVICE AUTO PILOT

All parts are mounted in full view, facilitating adjustments and trouble shooting while the system is in operation. Naval Air Mobile Trainer (Aircraft) Unit No. 506 utilized scrap parts to reduce the cost to a fraction of what trainers of this type usually cost. NAMT(A)-506 is a department of NATTC, MEMPHIS.

[DEVELOPED BY R. L. SMITH, ACMM(T)]

MCAS Builds a Better Film Dryer

MCAS EL TORO—Fulfilling the need of adequate drying facilities for various type negatives and film hangers, a drying cabinet was designed and constructed for use in the MCAS photographic laboratory.



CABINET KEEPS NEGATIVE CLEAN AND DRY

Coil-type heating units that can be controlled independently from a switch panel, thereby regulating the temperature in accordance with climatic conditions, insure maximum drying speed with a minimum of brittleness.

Installation of fiber-glass air filters and clear glass door fronts prevent dust spots, which often occur in open air drying or by opening a non-transparent door of a standard drying box while viewing wet negatives.

Sliding hard-wood racks, which may be pulled clear of the actual cabinet, allow additional negatives to be placed in the cabinet without disturbing those already in the process of drying.

In the lower section of the box, protruding rods have been placed for the drying of film hangers without dust.

[DESIGNED BY MT/SGT. WILLIAM H. FOLEY USMC]

SERVICE Test
INTERIM REPORT DIGEST

This digest covers the 15 September Interim Report of Service Test, NATC Patuxent, and does not necessarily reflect BuAer policy.

F8F-1 (120 Hours' Test)

Hydraulic Actuating Cylinders. Grumman fix incorporating cooling louvers in the wheel pocket door mechanism assembly, P/N 55018, was installed after 116.5 hours. Fix was designed to correct overheating of actuating cylinders which causes failure of "O" ring seals. No discrepancies noted during interim.

Exhaust System. Use of high power settings caused second failure of prototype #3 exhaust system after 132.1 hours. Exhaust stack from cylinders #8 and #10 was found cracked aft of junction of the two exhaust pipes. This assembly was replaced with standard stack assembly cylinders 8F and 10F, P/N 55330, which does not incorporate fish mouth welds. As no failures to date have occurred near the mounting flange incorporating fish mouth welds, and stack failure has been accompanied by either failure of studs or missing clamps, failure of the exhaust system is assumed to be from vibration between cylinder mounting flange and exhaust clamps.

A new exhaust stud was installed in #10 cylinder mounting flange and in #8 stack extension after failure of stack assembly.

Exhaust Troughs. Grumman field fix using a doubler of .025 stainless steel over standard production exhaust deflector (.025 stainless steel), P/N 55200, has proved unsatisfactory after 135 hours. Doubler was first spot welded to exhaust trough, and rivets were used upon failure of spot welds. Subsequent failure of both rivets and spot welds and warping of doubler has been experienced.

Induction System. Door assembly, alternate air, P/N 55577 failed after 135.2 hours. Failure was discovered during 120 hour check when alternate air doors would not fully close. Both door hinges were fractured. Hinges do not appear structurally strong enough to withstand either backfiring or forces imposed upon them when switching from alternate to direct air.

Engine Connection Box Assembly. Box cover has vibrated loose frequently due to failure of bracket assembly P/N 56570-4. A temporary service test fix of wiring bracket assembly to connection box cover and then safety wiring both clamps together has proved unsatisfactory. Vibration of engine connection box in flight causes cover to work loose and drop down into accessory section of engine. *Recommend* permanent change in installation to secure cover to engine connection box, using wing-nuts and threads through condenser ground return plate.

F4U-4B

20-M Cannon T31 (M3). During interim 15 firing flights were made. Stoppages occurred from following causes: three broken belts; two solenoid leads vibrated loose; two broken firing pins; one solenoid lock nut stripped; one broken slide anchor; nine cases due to worn feed mechanism.

Stoppages that have appeared throughout this test are still prevalent in installation. It is believed that excessive vibration of after section of gun causes breaking of trigger solenoid leads from cannon plugs, and shears rear buffer lock plungers after deforming the slot in the receiver body.

MK 9 Mod 2 Rocket Launchers Rocket syllabus has been delayed because of difficulties in obtaining telephone jack type pigtails. Also the airplane has been officially restricted from firing 5" HVAR.

F8F-1B

Cannon Installation. During this interim there were nine firing flights with six stoppages due to broken belts on the 20mm cannon, T31 (M3) installation.

Replacing old type gas vent plugs (.069" vents) with plugs having .081" vents improved gun operation.

Higher rate of fire causes frequent failures of lock washers. During interim there were two failures of the gas cylinder guide lock washers, two failures of the gas cylinder lock washer, one failure of breech block locking key plate, one failure of rear buffer lock plunger. On the outboard cannons the magazine slide anchor holds the hydraulic line to the gun charger against the gun opening in the main beam web, chafing the line and damaging the nipple into the charger. The forward end of the charger is pulled away from the gun. To eliminate this trouble the magazine slide anchor on the outboard guns was repositioned on the inboard side of the guns.

Hydraulic System. Both the handpump selector valve P/N AN6200-8B and the landing gear selector valve P/N 56219 were found to be leaking after 58 hours of operation. Removal of relief valve caps from handpump selector valve showed aluminum particles among coils of spring between setscrew and body of relief valve. Disassembly of landing gear selector valve showed cam lobes scored, steel particles around poppet valve seat, and plastic particles between shaft seals. Valve continued to leak after cleaning and reassembly. Conditions are apparently result of careless initial installation at the factory.

Horizontal Stabilizers. Although only nine firing flights were made this interim, empty cases are again damaging the tip of the horizontal stabilizer. Proposed fix is a steel boot covering leading edge of outer section of stabilizer.

PBM Squadron Sets Plane Mark

VP-208—This squadron set what is believed to be an all-time high for plane availability in a PBM unit during the seven weeks ended 2 August by averaging 83% for the 13 planes attached to the squadron each flying day.

The squadron was based at NAS JACKSONVILLE to provide flight indoctrination for 1947 Naval Academy graduates. A total of 1951 hours were flown and 576 flights made, with one plane returning to base early because of mechanical discrepancies. Student hours logged totalled 20,476. The high availability record was possible through cooperation of NAS supply in getting spares and replacements and good work by maintenance department men.

PUBLICATIONS

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

FLIGHT SAFETY BULLETINS

46 *Physical Fitness.*

AVIATION CIRCULAR LETTERS

129-46 (Confidential) *Security Classification of Naval Aircraft.*
130-46 *Motor Vehicles, Spare Parts, Tools & Consumables for Aircraft Carriers—Outfitting and Replenishment of.*
131-46 *Allowance of Aviation Armament Material Transferred from Bureau of Ordnance to Bureau of Aeronautics—Status of.*
132-46 (Confidential) *KUM-1 Pilotless Aircraft Model Designation; establishment of.*
133-46 *Aircraft Clocks—Handling of.*
134-46 *Reclassification and Configuration of Naval Combat Aircraft.*
135-46 *SNB-2P, -3P, -3E, -3Q and -3M Aircraft Model Designations; establishment of.*
136-46 *Discontinuance of Engine Bulletins.*
137-46 *Violation of Contact Flight Rules.*
138-46 *R4D-5R, -6R, -8E, -8E, -8T and -6T Aircraft Model Designation, establishment of.*
139-46 *Use of Naval Aviation Facilities by Naval Reserve Pilots in Private Airplanes.*
140-46 *Airborne Electric Equipment and Test Equipment; Installation, Overhaul and Maintenance of.*
141-46 *Bureau of Aeronautics Section T Allowance List—Cancellation of.*
142-46 (Confidential) *XAD-1W and AD-1W Aircraft Model Designations; establishment of*

TECHNICAL ORDERS

29-46 *Life Raft Equipment.*
30-46 *Landing Gear—Structural Parts—Inspection of.*
31-46 *Model J2F-5, -6 Airplanes—Restrictions to be Observed in Operation.*

SUPPLY NEWS

FROM ASO AND SUPPLY DIVISION BUAER

Identify Instruments by Number

Interchangeability of aeronautical instruments is determined by stock number. Instances have been noted of activities considering the specification or type number as a basis for interchangeability of instruments having different stock numbers. This is not correct. Section 8803 of the ASO catalog, pages 4 to 92, covers the various part number to stock number indices.

For example, page 42 column 1 shows the 1-1005 and 1-1006 as manufactured under AC-94-27393 which is the Air Corps specification number. However, one instrument is manufactured by Sperry, the other by G. E., and while they may be the same *functionally*, the size of the case, dial, etc., is different and for that reason they are assigned different stock numbers and are not interchangeable.

Following is a list of codes for standards used in Aeronautical Instruments Supplement 2, Section 8803, covering specifications and types but not manufacturers:

AC—Air Corps (Spec. or dwg.), AER—Aero Equipment references, AN—Army Navy Type (Spec. and dwgs.), ASX (formerly ASC)—Air Service Command, ATP—Army Type No., BHR—British Reference No., BUA—BuAer No. (Spec. or dwg.), HOM—Hydrographic Office No., MRK—Mark No., NAI—Nav-Air Intelligence, NBS—National Bureau Standards, NOS—Navy Specifications, NSP—Navy Aero Specification, RAF—Royal Air Force.

Supply activities are cautioned not to use any of the above coded numbers as a basis for identifying instruments. Use instead the manufacturer's part number if the ASO stock number is not known.

Use Catalog Part Number Index

Manufacturers use certain number and alphabetical sequences in developing part numbers to identify their product, and these numbers are usually of a definite length and follow a definite pattern. The part number indicator index, section 0004, of the ASO catalog has been developed on this premise to aid supply and maintenance personnel in identifying items when only part numbers are known, or if all digits of the part number are not quoted correctly, or class and nomenclature are not known.

The index contains 90% of manufacturer's part numbers in code, appearing in the sections of the ASO catalog listed in pages 26 and 27 of section 0004. Complete detailed instructions for use of this index are contained in pages 2 and 3.

Use this index before sending a TWX or speedletter requesting additional information on an item that cannot be identified immediately. All personnel are urged to study it carefully, use it freely, and submit suggestions or criticism to the Catalog Group of Aviation Supply Office.

Rocket Launcher Stock Numbers

Aircraft rocket launchers Mk 5 Mods 1, 2, 3, and 4 are made up of a group of four forward posts and a group of four after posts, each group mounted on a base plate. These base plates are attached to the under surface of the wing and may be attached integrally or cut into sections as required to accommodate the particular aircraft structure on which they are being installed.

Launchers, being returned to stock after removal from aircraft, have, in many cases, been cut into sections and therefore cannot be placed in stock with the complete four post launchers. The stock numbers which previously designated these launchers have therefore been canceled, and the stock numbers noted below shall be used for future ordering and stocking.

Mk 5 Mod 1 Launcher (Formerly R94-L-160140)

R94-L-160140-1	1 Fwd. & 1 After posts				
R94-L-160140-2	2	"	"	2	" "
R94-L-160140-3	3	"	"	3	" "
R94-L-160140-4	4	"	"	4	" "

Mk 5 Mod 2 Launcher (Formerly R94-L-160145)

R94-L-160145-1	1 Fwd. & 1 After posts				
R94-L-160145-2	2	"	"	2	" "
R94-L-160145-3	3	"	"	2	" "
R94-L-160145-4	4	"	"	2	" "

Mk 5 Mod 3 Launcher (Formerly R94-L-160150)

R94-L-160150-1	1 Fwd. & 1 After posts				
R94-L-160150-2	2	"	"	2	" "
R94-L-160150-3	3	"	"	3	" "
R94-L-160150-4	4	"	"	4	" "

Mk 5 Mod 4 Launcher (Formerly R94-L-160155)

R94-L-160155-1	1 Fwd. & 1 After posts				
R94-L-160155-2	2	"	"	2	" "
R94-L-160155-3	3	"	"	3	" "
R94-L-160155-4	4	"	"	4	" "

Make Correction in ASO Catalog

Aeronautical Instruments Supplement #1 Section 8802, page 7, item 172, Gyro Altitude Indicator—change power supply to read "26 volts" in lieu of the 115 volts now shown. Use of 115 volts on this particular instrument will cause failure. This change will be incorporated in the new revision of the Class 88 ASO Catalog section now being compiled and which will be distributed in the near future.

Stress Jig Provides Alloy Test

New means of testing various aluminum alloys to determine their susceptibility to stress-corrosion have been devised by NAVAL AIR EXPERIMENTAL STATION, PHILADELPHIA. An adjustable jig designed to accurately stress three specimens to any desired percentage of their yield strength resulted.

Straining the specimens by placing SR-4 gauges equidistant from ends and sides, they are placed in the jigs; aluminum alloy pins set in the base plate of the jig align the specimens and eliminate any possibility of unequal stresses being produced in the specimens.

A screw arrangement is used to close the jig, which, in turn, flexes the specimens to the required amount. Strain produced in the outer fibres of the specimens is automatically recorded on a chart by the SR-4 strain recorder.

Electrolytic action, which would produce false results, is avoided by the use of aluminum alloy throughout the entire jig assembly. Such an assembly has aided considerably in eliminating discrepancies in test results caused by variations in stresses produced by other types of jig formerly used, and it has also helped in handling multiple specimens which reduces the time involved in test setups.

Corrosion Stopped by Spraying

VH-4—Maintenance and the prevention of corrosion and rust on Ebeye Island is a constant problem. Because Ebeye is narrow, the planes are continuously exposed to the salt spray, dust and coral blown across the island. Constant cleaning with kerosene is not effective.

As an experiment, the engines were thoroughly cleaned with kerosene under 200 lbs. air pressure and allowed to dry. Then the nose section, cylinders, cooling fins, and exposed parts were sprayed with paralketone and gasoline.

After several hours of operation, the paralketone was baked to a smooth, almost permanent coating. The after part of the cylinders and cooling fins were not sprayed. Magnetos, ignition harnesses also were sprayed.

Engine operating cylinder head temperatures were increased 10° to 15°. The increase in temperature has given better engine performance and slightly lower fuel consumption. Operating temperatures on the water are not increased to a dangerous point. Corrosion has been reduced to a minimum.

▸ ***BuAer Comment*—Coating engines with corrosion preventive compound, specification AN-C52, does help retard corrosion, particularly on engines subjected to direct salt spray. It is not usually recommended because of temperature increases which in some installations may be excessive. Cylinder temperature indications obtained are usually taken from a small number of sample cylinders. It is not certain that the temperature rise is the same for all cylinders because of the change in cooling characteristics, therefore there is some risk in using the compound on engines where temperatures consistently approximate maximum permissible for the various power settings.**

NAS ALAMEDA—The state of California threw open the season on deer for 10 days recently and Harold Hinsinger, A&R employee, bagged one of the only two deer shot during the entire season by 2,000 hunters. The hitch: It was for bow-and-arrow huntsmen only.—*The Carrier.*

AVIATION ORDNANCE

INQUIRIES SHOULD BE ADDRESSED TO THE CHIEF OF BUREAU OF ORDNANCE

Aviation Ordnance Allowance List Out

The allowance list of aviation ordnance equipment for aircraft, NAVORD List 20,-870, has been revised, sent to press and is expected to be ready for Fleet distribution about 1 November. All of the latest changes affecting the post-war operation of ordnance equipment in aircraft have been incorporated.

The following new aircraft now being introduced to the Fleet, the F8F-1N, F4U-4N, F4U-4P, F4U-4B, FJ-1, FD-1, AM-1 and AD-1 have been added to the revised list. The new items of ordnance equipment and accessories listed below have been incorporated as appropriate:

Gunsight Mk 18 Mod 4
Gunsight Mk 23 Mod 0
Aircraft Sight System Mk 1 Mod 2
Illuminated Sight Mk 20 Mod 0
Line Maintenance Set for Gunsight Mk 23
Line Maintenance Set for Aircraft Sight System Mk 1 Mod 0

The other change in the allowance list of major importance to the Fleet has been the deletion of items transferred to Bureau of Aeronautics in accordance with Joint Circular Letter—BUORD NAVORD OCL V1-46—Aviation Circular Letter 24-46. For the allowance of such items consult Aviation Circular Letter 131-46 dated 12 September 1946.

In general, the allowance list provides a means for fleet service units to obtain necessary spare service and maintenance equipment to maintain efficiently ordnance equipment in aircraft for a minimum of three months under conditions that would exist in combat. Under conditions that are expected to exist in the post-war Navy, these allowances will be more than adequate. However, at present it is expected that there will be no tailoring necessary for peacetime requirements, nor is there any indication that the total armament of any of the combatant type aircraft be reduced. Special attention is called to the following procedure used in this allowance list:

To eliminate necessity of listing various but interchangeable modifications of the several different types of equipment, where adequate replacement stocks of an item exists, only the latest modification is listed as being allowed for installation in current aircraft. Accordingly, this is not to be construed as authorizing removal of older but still serviceable equipment from aircraft, merely to have the aircraft conform with the newest allowance list.

The allowance is for spare equipment to replace equipment not in proper operating condition. Such a procedure will insure that the most improved equipment reaches the Fleet but not as a retroactive change. In accordance with existing policy, no retroactive changes in ordnance equipment in aircraft is authorized unless such change affects safety in flight or affects military advantage. When such a condition exists, interested units will be notified by appropriate instructions in the form of a Circular Letter or Ordnance Modification Instructions (OMI-V).

Succeeds List of September 1, 1946 — *1 October 1946*

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

Aircraft	Bulletin	Date	Change	Date
F6F	139	5-9-46	96	12-20-45
F4U-F3A-FG	282	8-14-46	247	7-11-46
F7F	33	8-20-46	38	8-22-46
F8F	24	8-30-46	17	8-28-46
FR	22	8-26-46	34	9-6-46
F2G	0	0	3	6-26-46
J2F	23	3-14-46	32	8-12-46
JRF	13	8-22-46	12	7-12-46
JRB-SNB	54	9-10-46	27	3-20-46
PV	189	8-2-46	191	3-20-46
PBM	171	8-28-46	192	7-23-46
PBY	149	8-28-46	191	8-30-46
PB4Y	239	9-10-46	197	6-26-46
R5C	86	9-10-46	157	12-18-45
R4D	60	7-11-46	50	8-8-46
R5D	95	9-6-46	149	8-30-46
SB2C-SBF-SBW	247	9-4-46	168	7-31-46
SC	105	8-16-46	51	4-10-46
SNJ	39	8-2-46	31	7-17-46
TBF-TBM	222	8-12-46	249	7-23-46
TDD	3	7-3-46	0	0

For complete list of Aircraft Service Changes & Bulletins, see NavAer Publication Index NAVAER 00-500 and Supplement 00-500A.

It is pointed out that most of the modifications to ordnance equipment are merely design or production improvements, and although they require different stock numbers and a new modification number for distribution purposes they do not affect safety in flight nor have added military advantage over the original units. Accordingly, retroactive installation would be an unnecessary waste of time and effort and would tend to deplete an otherwise adequate supply system.

Bureau of Ordnance will welcome comments on the adequacy of this allowance list to meet operational requirements both as to quantities allowed and the kind of equipment listed. It is anticipated at this time that the next revision of the list will be issued to the Fleet approximately 1 July 1947.

Supply and Distribution of Aviation Gear

NAVORD OCL V5-46 has been issued and distributed to all aviation activities. This circular letter outlines the supply and distribution system for aviation ordnance equipment and lists all major and their dependent minor supply activities, and accordingly cancels and supersedes V26-43.

As set forth in the letter, the supply and distribution of aviation ordnance equipment will be effected through reserve storage points, ready issue points, major supply points, minor supply points, and to the dependent and satellite aviation activities.

New Allowances Set for Skeet Shooting

New allowances for targets (clay pigeons), shotguns, and trap shooting equipment are now in effect. The allowance for breakage of clay pigeons in transit has been increased to 20% as a result of studies made which proved that the 10% originally allowed was not sufficient. For additional information on allowances of this material see Bureau of Ordnance Circular Letter AV4-46 in Navy Department Semi-Monthly Bulletin, dated 30 June 1946.

Salvage and Overhaul Guide Is Issued

The First Revision of the Aviation Ordnance Equipment Salvage and Overhaul Guide (OP 1610) has been issued and distributed to all aviation activities.

This publication has been issued to assist supply officers in the Fleet and at shore activities in the handling of aviation ordnance equipment requiring repair and that in excess of requirements. Specifically it lists the status of all major items of Aviation Ordnance Title "B" Equipment including the newest equipment now being distributed to the Fleet.

It also lists all obsolete equipment if there are indications that some of the equipment may still remain in the supply system. Supply Officers should check their equipment closely to determine whether any equipment now on hand has been declared obsolete and can be disposed of in accordance with this publication.

NAS TILLAMOOK—For a small air station, Tillamook has a sizeable supply of planes aboard in storage or use: 185 TBM's, 54 SC-1s, 26 F4U-4's, 4 GB-2's, 3 GH-2's, two J4F's, and one each of J2F, GH-3, AE-1, NE-1, JRB and JRF.

LATEST BULLETINS AND MODIFICATION INSTRUCTIONS

Dated 1 September 1946

ENGINE	MOD. NO.	DATE	SUBJECT	EXPLANATION
R-1830				
NavAer02-10C-500				
	Modification 1	7-15-46	*Housing, Auxiliary Drive*	To improve lubrication.
	Modification 2	7-15-46	*Crankcase Thru Bolts—Tightening of*	To reduce the possibility of galling and wear of crankcase mating surfaces.
	Modification 3	7-15-46	*Ignition Manifold—Supporting Brackets—Reinforcement of*	To increase strength of subject brackets.
R-2000				
NavAer02-10F-500				
	Modification 1	7-15-46	*Housing Auxiliary Drive*	To improve lubrication.
	Modification 2	7-15-46	*Crankcase Thru Bolts—Tightening of*	To reduce the possibility of galling and wear of crankcase mating surfaces.
R-2800				
NavAer02-10G-500				
	Modification 1	8-1-46	*Crankshaft Bolts—Plating and Stretching of*	To provide instructions regarding the plating and stretching of crankshaft bolts.
	Modification 2	8-1-46	*Flexible Lines for Water Injection Equipment Installed on P&W R-2800-8W, -10W, -18W, -22W and -34W Engines—Manufacturing and Installation of*	To prevent failures caused by action of temperature and vibration on water injection equipment tubing.
R-4360				
NavAer02-10H-500				
	Modification 1	7-15-46	*Propeller Shaft Thrust Bearing Cover Slushing Hole*	To permit preservation of the propeller shaft thrust bearing without removing thrust bearing cover.
	Modification 2	8-15-46	*Valve Tappets and Tappet Guides*	To standardize dimensions.
R-1820				
NavAer02-35G-500				
	Modification 1	7-15-46	*Ignition Harnesses—Interchanging Split Ring and Continuous Ring Types*	To permit interchangeability between split ring and continuous ring type ignition harnesses when either Scintilla or Edison magnetos are used.
General Engine Bulletins				
	94	8-12-46	*Compression Checks—Aircraft Engine Cylinders*	To describe the use of a compression tester for checking compression in aircraft cylinders.

Adjusting of Electric Trigger Controls

Reports from the Fleet of fatal accidents resulting from run-away Caliber .50 BAM Guns, M2, due to over-adjustment of the electric trigger control, Mk 5 Mod 1, indicate that ordnance personnel are neglecting to review and/or are neglecting to have all new ordnance personnel review pertinent ordnance publications on the subject equipment.

It is extremely important that these publications be periodically reviewed in order that all personnel will be cognizant of the hazards likely to be encountered if the subject controls are improperly adjusted.

Over-adjustment of the solenoid sear pin will result in its being damaged by the bolt when the gun is fired. When this occurs the solenoid sear pin is usually slightly bent or burred, resulting in its inability to retract when the solenoid ceases to be energized and subsequent automatic firing of the gun when the bolt is allowed to go forward into battery.

Frequent inspections should be made to check for malforming of the edges of the sear slide groove and the semi-circular recess just forward of the sear slide groove and for the existence of scorings along the right side of the bolt. The solenoid sear pin should also be regularly inspected for burrs and other deformities.

Existence of any of the aforementioned conditions will indicate that the solenoid sear pin has been over-protruded. (It is to be noted that in many instances when trigger controls cannot be adjusted to fire within the specified timing range interchanging of bolts until the proper clearance between the bolt and the gun side plate is obtained will obviate this difficulty.)

Quite a few cases of automatic fire have occurred due to ordnance personnel clearing a gun with the hydraulic charger. In no instances should this be done as the presence of a defective or over-adjusted trigger control can more than likely result in automatic fire. Use of a tool as described in the August issue of the NAVAL AVIATION NEWS is recommended for removing ammunition from all Caliber .50 Guns.

Ordnance personnel maintaining aircraft guns using Electric Trigger Controls, Mk 5 Mod 1 are urged to review Ordnance Technical Instructions V13-43, dated 15 April 1943, Ordnance Modification Instructions V2-43, dated 23 November 1943, and Ordnance Pamphlet 1400 (Preliminary) dated 27 December 1944. The latter also provides instructions regarding adjustment of Electric Trigger Controls, Mk 5, Mk 7 Mods 1 and 2, and Solenoid AN-G-19.

BuOrd Overhauling Aviation Shotguns

The Bureau of Ordnance is overhauling all aviation shotguns (Remington Model 11, 5-shot and Remington *Sportsman*, 3-shot) in Class 265 at the Small Arms Repair Shops, NSD OAKLAND and NSD NORFOLK. The individual magazine capacity constitutes the main difference between these shotguns, although there are other parts such as pins, plungers, fore ends, etc., which also differ.

The majority of parts of both guns, however, are interchangeable. The bolts of both type guns, although having dissimilar part numbers, are also interchangeable, the only difference being the stamping of "Model 11" and "Sportsman" respectively thereon.

The only criteria for determining the model of aviation shotguns other than by the aforementioned stamping of the bolts is by the magazine capacity. Consequently, as stock numbers are assigned primarily according to magazine capacity and as the type of magazine employed is not externally readily apparent, particularly to those not familiar with shotguns, it is of the utmost importance that the correct bolt be used in both models of guns in order to avoid confusion.

During the overhaul program it has been found necessary in a few instances to use Model 11 bolts with *Sportsman* magazines due to the unavailability of *Sportsman* bolts. This mis-matching of bolts and magazines was permitted, provided the fore end of the gun was stamped or otherwise marked with the correct stock number of the gun, as otherwise the overhaul program would have been extremely retarded. Activities using aviation shotguns are urged to make every effort to match bolts and magazines of the guns when replacing parts in order to avoid confusion in the supply system.

NAS QUONSET POINT—Careless use of cigarets in the WAVE barracks caused the only fire damage at this air station during the fiscal year ended 30 June. Loss was only $500, a considerable reduction from the $1800 loss in 1944 and $1350 in 1935, the fire department reports. During the year the department answered 242 alarms, 31 of which were false. Constant inspections of buildings, rubbish collections, installation of safety lanes in buildings and inspection of inside pipes, air conditioning and refrigerating systems helped cut down losses from fires around this air station.

LETTERS

SIRS:

In your July issue was a photograph of our ship, the U.S.S. *Juneau* (CL-119). We would like to call your attention to the fact that you erred in placing the *Juneau* in the *Oakland* class. The *Juneau* is the first of three CL's of the new anti-aircraft type—*Juneau* class ships.

THE STOREKEEPERS OF THE U.S.S. JUNEAU

¶ According to the official *Naval Vessel Register*, BuShips, 1946, there are seven CL's in the *Oakland* class—*Oakland, Reno, Flint, Tucson, Juneau, Spokane* and *Fresno*. For purposes of bureau records, the *Juneau* is called the 119-class. ONI 222-US, *U.S. Naval Vessels*, lists them also as the *Oakland* class.

SIRS:

In regards to your back page of August, 1946, issue of NAVAL AVIATION NEWS on squadron insignia. CAG-7 insignia happened to be printed upside down. I would not mind except that it shows the good luck ran out in that squadron, which is true. We did have a lot of tough luck but when you print VT-7 insignia, please show it with the horseshoe holding in its good luck.

I am not trying to replace *Grampaw Pettibone* comment, but I imagine that the Air Group and their lovers "The Flight Deck Crew of the Hancock," CV-19, will be very much provoked about the whole situation.

E. P. SMITH, CAP, USN

NAS MOJAVE.

¶ Apparently NANews' art department is neither superstitious nor a horseshoe player—it mounted CAG-7's horseshoe insignia upside down without knowing it was wrong. It is hereby reproduced again, the right way.

SIRS:

In your September issue you state that VPB-107 is credited with only five and a half submarines. This is underestimating 107's achievements. The score sheet, to the best of my knowledge, runs somewhat as follows:

1. About 26 July 1943 by Lts. Waugh and Taylor. (Lt. Waugh and his crew were lost on this run.)
2. About 13 August 1943 by Lt. Cdr. Pruehrer, squadron skipper. (He and his crew were lost on this run.)
3. 6 November 1943 by Lts. Baldwin and S. Taylor. (This was a four-hour flight during the course of which the picture on page 9 of your September 1946 issue was taken.)
4. 20 November 1943 by Lt. (jg) Dawkins.
5. About 6 February 1944 by Lt. (jg) Pinnell.
6. About 8 April 1944 by Lt. Krug. (This sub actually remained afloat for some two weeks after the encounter but had to be sunk or sank naturally, due to effects of the action.)
7. About 15 September 1944 by Lts. Krug and Burton.

This tally does not include the two submarines which were garnered by VP-83 which became VPB-107 in June of 1943 with practically no change in personnel.

All told then, the score sheet runs up to seven if you exclude the work 107's boys did as VP-83, or nine if you include it.

EDWARD T. BRENNAN, LT.

VP-62

¶ Figures in NANEWS tabulation of submarine "kills" were taken from the Chief of Naval Operations Committee on Assessment of Damage to Enemy Submarines. Their records agree in the main with the first five claims, but do not credit the last two mentioned. VP-107's record according to the committee, was: 23 July 1943, U-598; 11 Aug., U-604 shared with VP-129); 5 Nov. U-848; 25 Nov. U-849; 6 Feb. 1944 U-177; 29 Sept. U-863.

SIRS:

What do you mean "contrary to Navy practice" (VB-5 letter in NEWS of July 1946)? Air Group Four pilots have been polishing and cleaning their planes since this group has been embarked aboard the U.S.S. *Tarawa* (CV-40).

I'll venture to say they're the cleanest (at least) planes in the fleet. (We hope, however, that this practice of pilots cleaning their own planes cease when plane captains become available).

S. L. SILBER, CDR., USNR.

¶ Are any other squadrons as industrious as CAG4? We still think it is a little out of ordinary Navy practice for lieutenant commanders to load 25,000 pounds of freight in R5D's, due to lack of ground personnel, as VR-5's officers did.

The Cover This fine cover photo pays tribute to one of Naval Air Transport Service's workhorses, the PB2Y *Coronado*, now on the retired list. Compass direction of the runway and its length are told by the figures.

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ANSWERS TO QUIZZES

● BEST ANSWERS (p. 12)

1-C, 2-B, 3-B, 4-E, 5-B, 6-D

● GRAMPAW QUIZ (p. 7)

1. Not unless the airport happens to be at sea level. Ref. T.O. 07-45.

2. Yes, subject to the restrictions in ACL 04-45.

3. When the plane first begins to swerve. Tendency is to delay too long in using brake. Ref. T.N. 49-42.

4. An accurate record of the full combat power time accumulated on the engine must be maintained in the engine log book. Ref. T.O. 08-46.

5. (b) Two hours between each overhaul. Ref. T.O. 08-46.

● NAVIGATION QUIZ (p. 10)

1. (a) DRM, 346°, (b) SRM 133K., (c) T.H. 353°, (d) Cus. 350°, (e) G.S. 125, (f) ETA 1244 GCT.

2. (a) Lat. 05°-54'N., Long 81°-52'W.; (b) 21 miles.

NAVAL AVIATION NEWS

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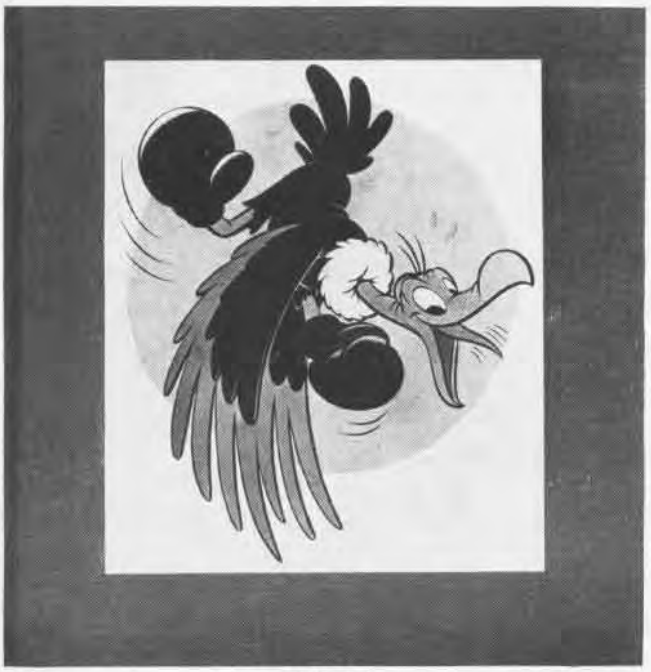
SQUADRON INSIGNIA

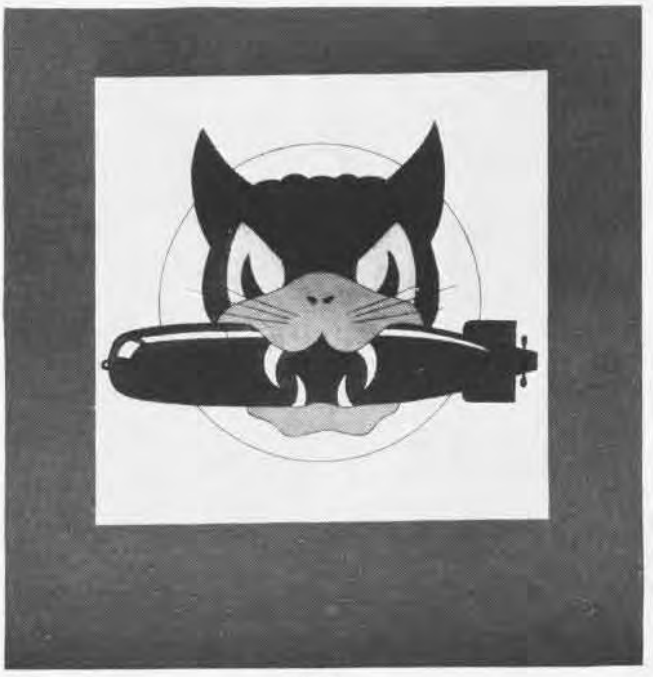
ONE OF the most ornate insignia in Naval Aviation is possessed by Night Carrier Air Group 52. Drawn by Milton Caniff, three armored, winged horses carrying fully mailed riders advance out of a constellation of stars, signifying the fact that the group may join battle against the enemy wherever it finds him. The hooded figure symbolizes the secret nature of 52's missions; the pointing finger is radar's searching probes. The horses and riders represent the night fighters, night torpedo and night bomber aircraft which operate with CVG-52 squadrons

CVG-52

VBF-4



VMF-322



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