

NAVAL AVIATION

NEWS



Pilot Training
Terrain Models
Navy Air Bases

October 15, 1944
RESTRICTED

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The pilot was stunned—

THE raid on Wake Island was routine for P. T. Bonilla, AOM2c, until the SBD in which he was rear seat man started home and the engine cut out.

▶ "I thought we were just changing tanks, and then I heard my pilot say we were going in the water," Bonilla said. They hit easily, and then smacked a big wave, hard. By the time Bonilla got out, his pilot was on the wing, apparently somewhat stunned. Bonilla got the life raft from its stowage cylinder aft of the rear cockpit, broke it out, and jumped in as the plane went down.

▶ The pilot, burdened with his parachute, back pad, and chute raft, stayed on the wing until it sank from under him, and then was in the water. He had forgotten to pull the toggles to inflate his "Mae West" jacket, or was too stunned to do so. The wind had blown Bonilla away from his pilot, but he called to him to inflate his life jacket, and—unable to find the oars—used his hands to paddle to the pilot and finally got him into the raft.

▶ During the night they fired flares, about one an hour. They were afraid of drifting onto Wake, and rowed away from it. Next day they kept rowing, ate a small amount of food, and drank about half of one can from their supply of half a dozen cans of water. They took turns sleeping and as lookouts.

▶ During the second night they fired more flares, but most of them had been wet from the waves and from rain, and wouldn't work. At daybreak of the second night they saw a searchlight, briefly, thought it was Wake Island, and decided to get away from there. They had only one flare left, and didn't use it. Later they talked it over and decided it was a friendly rescue vessel they had avoided, and were very blue.

▶ That day they had two malt tablets and a little water. They protected the remaining flare carefully from the wet. The third night passed, and at daybreak they again saw a light, and fired their last flare. About an hour later they saw a rescue ship coming straight toward them. It had seen their flare from nearly 20 miles away, and was just leaving the area when the flare was sighted!

No. 10 of a series.

AIRCREW MEN HAVE WHAT IT TAKES!



TERRAIN MODELS

A TERRAIN model is a three-dimensional view of a portion of the earth's surface in miniature. The primary wartime use of such models is to present all available information on enemy terrain in the most easily understood form possible. Military personnel planning strategy can study the model of an area of operations carefully and leisurely from all altitudes and directions and under various lighting conditions. It provides them a three-dimensional synthesis of all known and supposed facts about a particular objective based on contour maps, reconnaissance photos and ground information. Commanding officers in the field have praised the value of terrain models because they give all personnel not only a familiarity with their ob-

jective but also added confidence in the thoroughness behind the operation in which they are engaged. In landing operations, photos of an accurate model of a stretch of coastline taken from an angle which enables beaches, cliffs, rocks and other important landmarks to be recognized promptly from sea-level, can be supplied every landing craft taking troops ashore in the landing.

IN PREPARING an air attack the pilot can rehearse an approach from his assigned angle sliding his hands in and out of the valleys and dropping "bombs" on his objective, actually getting the "feel" of the land. When the attack begins, the pilot has a vivid impression he will remember and carry out in the stress of combat.



LARGE PLANNING TERRAIN MODEL OF ATTU PLAYS A LEADING ROLE IN DRESS REHEARSAL FOR INITIAL LANDINGS ON THE ALEUTIAN ISLANDS

LARGE SCALE MODELS AID ATTACK FORCES ABOUT TO HIT JAP AREAS

THE LARGE model of Attu in the photograph above is being used en route to the attack on the Aleutian Islands to instruct coxwains of landing boats in their invasion procedure. This is one of the important types of terrain models being used in planning operations against our enemies. These models are divided into types according to their scale. Those at scales smaller than 1 to 20,000 are called Planning Terrain Models and are useful for over-all planning tactics, presenting an accurate reproduction of the coast line, and indicating the general character of the terrain under consideration. For planning air attacks, models at 1 to 25,000 or 1 to 50,000 are most useful. Since hardly any detail can be shown at small scale, the result is actually a three-dimensional relief map, representing the geological form of the area with its most outstanding feature such as

rivers, railways or towns indicated in a general way. At such scales it is usually necessary to exaggerate altitudes as compared to horizontal distances to stress the type of terrain. Assault models are larger in scale, ranging up to 1 to 5,000. As the name implies, these are used in studying amphibious landing operations, Task Force movements near land, or fire control problems. Because of their use, these models must be very accurate, especially the shore line, and there can be no distortion of vertical distances to stress terrain.

TARGET, or Low-Level Models, are used to brief pilots in strafing or bombing attacks on specific enemy installations. These are large scale models, 1 to 5,000 or larger, and show details of combat terrain. Buildings and military installations appear as they actually are related to one another, and mobile objectives such as planes or vessels are placed on the model to represent their current location. These models are often used to advantage in combination with high level or assault models, especially if the target contains important military installations. These installations will show up only in the terrain models of large scale.



WATER-LEVEL VIEW OF THE MODEL SHOWS EXACTLY WHAT LANDING BOATS CAN EXPECT TO SEE WHEN THEY APPROACH ASSIGNED LANDING BEACHES

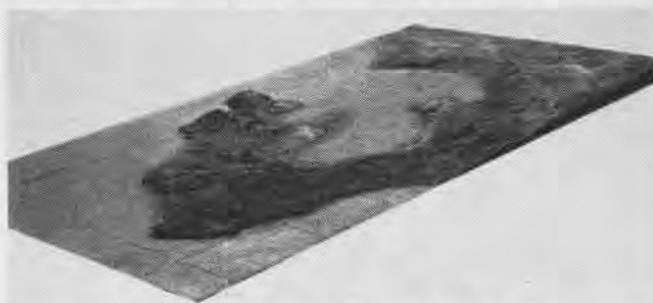


PILOTS CAN ACTUALLY GET THE "FEEL" OF THE TERRAIN AS THEY MAKE "BOMBING RUNS" ON THE MODEL TARGET FROM DIFFERENT DIRECTIONS

MAPS, PHOTOS, GROUND DATA ALL GO INTO MAKING TERRAIN MODELS

CONSTRUCTION of terrain models is based on information derived principally from maps, aerial photographs and ground information such as HO charts, Army G-2 and ONI data, and guide books. It is important that the model maker have a sound understanding of map-reading and photo interpretation. His work on the area being studied begins with maps on which relief is represented by contour lines, hachures, shading and spot elevations. His first task is to project these elevations vertically presenting the earth's surface in its natural three-dimensional form. His second task is transferring vegetative and man-made features shown on the map and photos to the model, representing them in as realistic a manner as time and the scale of the model permit. Models are no more accurate than the maps, aerial photos and other information used in their construction.

WHILE maps are sometimes outdated or inaccurate, air photos are valuable in presenting accurate up-to-date and detailed information on the area to be modeled, and both natural and man-made features appear more normal and familiar in photos than on maps. Even indications of the colors of the terrain may be obtained from photos by experienced photo interpreters, but if color accuracy is important, decisions must be based on observations made in the field. Training in photo interpretation is essential also when it comes to recognizing characteristic appearance on aerial photos of various features and objects in enemy territory, such as industrial buildings, roads, aircraft and airfields, military works and equipment—features that must be spotted on photographs and reproduced in accurate scale and relationship on large scale models to familiarize pilots and bombardiers with the terrain and target.



MODELS SHOW APPEARANCE OF TARGET FROM EVERY APPROACH



RUBBER TARGET MODEL OF ROI, NAMUR REVEALS INSTALLATIONS

TERRAIN MODEL-MAKING REQUIRES SKILL

THE NAVY Photo Interpretation Center at Anacostia has been designated as model coordinating agency for all terrain model activities in the armed forces. This agency functions as a training center, avoids duplication of models and effects an interchange of information concerning new processes and techniques in building terrain models. Separate techniques for finished workshop type models and those built in the field have been developed and a terrain model workshop established to train Army, Navy and Marine Corps personnel in field techniques. Types of production units include small field units

working on a small scale with materials available at hand and turning out one or two copies of a model, larger field units where rigid models are produced in quantity, and rear area units producing both rigid and flexible models in quantity. Rigid models are made of such materials as plaster or papier maché in one piece or several sections. Flexible types are made of rubber or some synthetic material, allowing the model to be rolled up and mailed or carried with great convenience. Important stages in producing a flexible type terrain model are shown herewith in the following series of pictures.



Navy Photo Interpreters check over maps, charts and aerial reconnaissance photographs in preliminary study of area to be modeled. These data are checked carefully with available ground information to insure accuracy in master drawings for the model



After master tracings are made and checked with all information available, contours are transferred to cardboard. Each contour will form a layer in the structure of the model over which plastocene or a similar material will be laid to create a realistic effect



Contours have been fastened in correct positions and are being covered with modeling clay which is applied with the fingers. Vertical distances often are exaggerated for terrain effect which will help aviators size up areas to be hit by aerial strikes



Contours are now completely covered with clay and important features have been added. The workers are pouring plaster over the model to produce a mold that can be used for mass production, thus turning out quantities of models if operation is large



Plaster mold has been lifted off the original clay model which now has served its purpose. Workers are cleaning mold and repairing any small defects. A large number of copies of the model now can be made in master mold, of plaster or flexible material



Plaster mold, resting on its wooden frame and edged with strips for protection, is being sprayed with a light coating of rubber. After several thin coats of rubber have dried, a thicker layer of light foam rubber is added to level off the underside of model



Dried rubber model is lifted from the plaster mold, which now can be used over again. This type model is extremely light weight and can be rolled up for convenience in shipping or storage. It is durable and is able to withstand rough handling



Final stage in the production shows worker applying color to model with spray gun. Finishes are as realistic as possible. In some cases a sensitized emulsion is applied and a photo image of the area projected onto the model (to facilitate manufacture)



SALIENT FEATURES OF THE ASSAULT SECTOR OF SOUTHERN FRANCE ARE POINTED OUT ON THIS RUBBER MODEL WHICH ACCOMPANIED INVASION

GRAMPAW PETTIBONE

Little Did He Think

A division of four F6F's ran into a low ceiling on a routine tactics flight. Although his wingmen were relatively inexperienced, the flight leader took them up through the overcast. When it came time to return, he began a slow letdown from 2000 feet, with his flight in close formation and without attempting to use any of the numerous radio aids which were available.

As the group suddenly popped out of the overcast, the second section leader was forced to jerk back on his stick to avoid flying into some trees. Even then, his wings brushed through the top branches. His wingman, however, was unable to pull up in time. He crashed.

 Grampaw Pettibone says:

A particularly brilliant display of poor judgment!

This division leader might know better next time and then again he might pull some other equally dumb stunt. His C. O. evidently had doubts along this line for the case has been referred to a special



board, in accordance with BuPers Circular Letter 62-44, to determine his fitness as a naval aviator.

Incidentally, you pilots better read this BuPers letter carefully, paying particular attention to classifications 3 and 4 of paragraph 6. If these descriptions fit you, take my advice and reform while you have time.

Know Your Emergency Equipment

After a normal take-off, the pilot of a FV could not raise his port wheel so decided to lower the gear again and land to find out what was wrong. The right wheel and the tail wheel lowered and locked but considerable pumping on the manual hydraulic pump was necessary to lock down the port wheel. While circling the field, the pilot tried to lower flaps manually, but could get only 10°. So he decided to make a no-flap landing in order to save the remaining hydraulic pressure (600#) for landing.

During the landing run, two crew members pumped continually on the hydraulic pump in an effort to maintain brake pressure, but the brakes failed completely about 250 feet short of the



end of runway. The airplane was still rolling quite fast and in an effort to avoid going off into soft sand at the end of the runway the pilot attempted an intentional ground loop resulting in major damage to the aircraft.

► COMMENT—The pilot's procedure in this case was correct insofar as he went, but he must be held mainly at fault for this accident, because, knowing that his hydraulic system was not functioning normally, he did not stand by to use his emergency brake system. This system was installed for exactly such emergencies.

No Good Unless Used

An SBD pilot continued dive bombing practice for an hour and a half after he realized he had an oil leak. All this time a light oil spray was blowing through the cockpit, making it necessary for him frequently to wipe his goggles. As he entered his fifth dive, the propeller went into low pitch and the engine oversped, necessitating a forced landing in soft terrain. Examination of the engine showed there had been a break in the propeller governor oil line and that loss of oil had resulted in severe deterioration of the engine.

When interviewed, the pilot admitted he had not read the oil tempera-

ture, cylinder head temperature, or the oil pressure gauges during the entire flight. It was felt by the investigating board that had the pilot kept a close watch on his engine instrument gauges, especially after noting the marked loss of oil, he would have realized what was happening to the engine and would have been able to make a deferred forced landing at his home field without doing damage to either aircraft or engine. Eighty per cent of the cause of the accident was assigned to the carelessness of the pilot.



Grampaw Pettibone says:

This is heartbreaking! Here's a guy with over 300 hours' flight time, supposedly qualified to fly dive bombers, who hasn't yet learned to watch his gauges—even when he is having trouble.

There's a lot more to flying than just manipulating the stick. I don't care how hot you are at the controls, if you don't have enough sense to keep a running check on your instruments, specially in a jam like this, then you haven't got what it takes to be a naval aviator.

The Human Mole

At 1,200 feet, the engine of an FM-2 began cutting out. The pilot was unable to get it running smoothly again and altitude was lost until, at 400 feet, the pilot lowered his wheels in preparation to land on a highway. At the last minute he noticed power lines and poles obstructing his flight path, so decided to land in an adjoining plowed field. It was then too late to retract the wheels. The pilot tells the remainder of the story in his own words:

"I had locked my shoulder straps immediately after the conk-out which was all that saved me. After the plane rolled over and landed on its back, it buried itself about three inches below the level of the hatch line, due to the soft dirt, completely sealing me in.

"My head was jammed into the soft dirt and broken glass, completely shutting off air. I held my breath and wiggled as long as I could, then took a gulp. I swallowed dirt and inhaled dirt, but got a little air. I then popped my safety belt, put my knees on the dirt, pushed up and so formed a little pocket in which to breathe. I kept burrowing to improve this position and when satisfied I wasn't going to smother, I felt around and turned off everything possible. The switch was already off, so I turned the gas and pulled the mixture and throttle all the way back, then waited till the crash crew arrived and dug me out."



Squadrons

LET NA NEWS
HEAR FROM YOU!

Naval aviators realize that physical condition is highly important in combat. These pilots, just back from a strike at Guam, play basketball for relaxation in carrier elevator



GRAMPAW'S SAFETY QUIZ



All aviators should know the answers to these questions. In the air, the penalty for not knowing may prove fatal. If you miss an answer on the ground, penalize yourself by looking up the reference.

1. Should you inflate your life jacket on the way down in an over-water parachute jump?
2. Above what altitude should you be if purposely running a tank dry to get an accurate fuel check?
3. What is the meaning of a series of alternating red and green flashes directed at a pilot from the control tower?
4. When there is no horizon during take-off, why is it dangerous to operate auxiliary cockpit controls before gaining a safe altitude?
5. For what maneuvers and under what circumstances should the electric-driven fuel pump be used?

Answers on Page 40

Accidents Trying to Happen

When the TBF airplane was designed an interconnection was incorporated between the control for the landing gear and the flap control to prevent the pilot from inadvertently landing without lowering landing gear.

The mechanism has very effectively accomplished its purpose. Only a few belly landings have been reported, and they have occurred when the pilot, taking a wave-off, has raised his gear to circle the field and forgotten to lower it again.

Like any other design with advantages, this one has its disadvantages. Provision was made for lowering flaps separately from the landing gear for emergency water or rough terrain landings, but under the urgency and the stress of the emergency, the pilot occasionally failed to operate the special button provided for lowering flaps only.

After realizing that his landing gear also was lowered, the pilot found it was too late to retract it and frequently paid with his life for this error. Another disadvantage was the requirement of the interconnector for near-perfect adjustment. Only a slight maladjustment, which may be caused by wear, sometimes results in both landing gear and flaps being raised after

a take-off when the raising of only the landing gear is intended. Loss of the airplane usually results.

Because of these disadvantages, it is considered advisable to remove the interconnection feature from this control. Because of the work load involved, the procedure change and the service change will be slightly different. As a result, the pilot should read Aircraft Service Change No. 210 to familiarize himself with this change. Briefly, the pilot now will operate the control as follows:

In All TBF's and TBM's

1. Operate flap control and landing gear control separately.
2. Always trip lock lever to left of landing gear lever when operating the landing gear control.

It is realized that a slight hazard in normal landings is being added, particularly to pilots with tendency toward subconscious or careless operation of their controls. It is believed wise to pay this price for the real increase in flight safety in emergencies.

Neither of the operation items suggested above are necessary on unmodified airplanes, and item 2 is not necessary on airplanes not modified in production. However, both operations may be used on either modified or unmodified airplanes and it is believed that their development as a habit can be valuable in accident prevention.

Light of Your Life

During a pre-dawn launching, the catapult failed and an F6F went over the side. The pilot got out and was heard to yell, "Here I am" as the ship passed. A thorough search of the area by destroyers, however, failed.

Prior to being catapulted, the pilot gave the ready signal with his arm, which indicated that he had no flashlight or that it was out of order.

In his official report of the accident, the commanding officer recommended, "All pilots participating in night flights should be cautioned as to the importance of having a water-proof flashlight

in good working order. Five persons from this vessel have been rescued from night crashes due largely to the fact that they all had flashlights."

A Maintenance Crash

A TBM-1C made a normal carrier landing, engaging No. 3 wire. After a run-out of approximately 50 feet, the arresting hook and its carriage parted from the airplane which continued into the barrier.

Investigation of the failed parts indicated that the arresting hook track failed because the hook carriage was not locked in the down position.

Dirt in the track had prevented the carriage from locking properly.

This accident was attributed entirely to maintenance. The Trouble Board recommended more careful attention to the cleanliness and proper lubrication of tail hook tracks.

Thick and Red

From the Corpus Christi "Aviation Safety Bulletin":

"A young pilot with very thick head,
Now has a long face that's bright red;
He had a bad lapse
When he reached for his flaps
And pulled up his wheels instead."



DID YOU KNOW?

NAS Civilians Buy Bonds Lead All Other Navy Activities

Naval air stations led all other Navy activities in civilian war bond participation in August, with an over-all total of 95.5 percent. They maintained second place in percentage of gross payroll invested, with 11 percent.

Jacksonville was first among air stations in participation, with 97.3 percent and in payroll investment with 11.7 per cent.

Displaying increased momentum, the entire Navy war bond program again passed the 30-million-dollar mark in August, for a total of \$34,719,265. This brought the grand total of bond sales since October 1941, when the program began, to \$737,721,617.

Navy Sets Up Record Plan To Keep Complete Plane Statistics

No longer are Navy aircraft anonymous and interchangeable pieces of machinery.

With the establishment of a new aircraft record and reporting system, effective 31 August, each plane has its repairs, alternations, locations and assignments tabulated in a record system rivaling in thoroughness records kept for enlisted men and officers.

It sounds complicated, but it is not, and the information produced makes possible a kind and degree of control over naval aircraft which has probably never before been equaled in any Navy.

Here's how it works: At the end of each month, each command having aircraft in its custody will report by airmail to DCNO (Air) the numbers and ages of all the aircraft on hand by types and by models. It reports the aircraft received during the month, the aircraft transferred to other commands, the aircraft lost, and the aircraft returned for reconditioning. When an aircraft is lost, it reports when and how they were lost. In the case of aircraft repair, it reports extent of repairs.

These are only a few of the facts which will be checked off on forms which have been supplied to all commands. Altogether, the reports present each month a complete picture of the number, age, and status of all aircraft.

These reports have been developed as a result of the recommendation by the Radford Board that the combat

planes of the naval aeronautic organization be operated henceforth on a carefully controlled and integrated plan.

The findings of the Board, submitted 4 May and now in process of implementation, are designed to produce important benefits for the Navy. The new policies make it possible to supply more new and more militarily superior planes to the Fleet, to eliminate from the combat commands older planes which have lost their combat advantage, and to improve the efficiency at the advanced base repair units by relieving them of extensive repair jobs on older planes, and thus enabling them to spend all their time keeping newer planes in top shape at all times.

The recommendations also provide the opportunity for better planning of A&R activities in the U.S. and for better control of spare parts purchases and inventories.

System Improves Spare Parts Control

The exercise of that kind of control requires complete, detailed, accurate, and up-to-date information at all times. The new reporting system has been designed to produce such information.

First, the commands fill out the forms and airmail them. When the forms are received in Washington, the statisticians take over. They tabulate the information with the aid of nearly human tabulating machines; then they analyze it, organize it, extract the facts of partic-

ular usefulness to each bureau, division, and section, and produce reports which are then distributed to people who need the information.

With this caliber of information readily available, it will not only be possible to supply promptly the necessary day-to-day planning and operating information, but even more importantly, it will be possible to provide the information necessary for backing up quick changes in strategic plans, calculating more accurately aircraft losses to be expected, and for measuring stamina and endurance of new models of planes.

Each airplane will serve its hitch under the watchful eye of the new record and reporting system. It will be assigned during each part of its useful life to duties to which it is then best suited. When its tour of duty as a combat plane has been completed, if it is in good condition, it will be returned, reconditioned, and assigned to duty in U. S. for training or for the use of forming or reforming squadrons. When age and condition indicate that a plane has passed the peak of its usefulness and when its repair record shows that it is becoming too expensive in man-hours to maintain, it will be stricken from the records, cannibalized for needed parts, and melted down into critical metals.

It is a big job. It will require the full and complete cooperation of all units operating or handling aircraft and will require accuracy, speed, and coordination. But it will be worth the effort many times over in terms of better planes for combat fliers, and a faster, smoother working aeronautic operation.

COMMANDER
3RD FLEET, U.S. NAVY
COMMANDER IN CHIEF
SOUTHWEST PACIFIC AREA
BRISBANE AUSTRALIA

*To Halsey for Mitscher from Arnold,
information Cincpac*

CONGRATULATIONS ON THE OUTSTANDING SUCCESS OF THE RECENT UNITED STATES NAVAL AIR ENGAGEMENTS OF THE MANILA AREA. IT IS A TRIBUTE TO THE TRAINING OF YOUR ORGANIZATION AND THE ABILITY AND LEADERSHIP OF THE UNITS OF YOUR FAST CARRIER TASK FORCE. MAY YOU HAVE MORE VICTORIES WITH THE SAME OR BETTER RESULTS THAT IS THE WISH OF THE AAF.



RESTING IN THE SHADE, this Marine airman finds the wing of a Vought Corsair is a handy lounge where he can catch up on his correspondence. Scene is at Bougainville airfield where comfort is at premium.

PUBLICATIONS

Structural Repair Handbooks Are Ready

There has been developed within the last 18 months a new and comprehensive technical publications program covering the repair of aircraft structures.

The basic manual in the series is the *General Manual for Structural Repair*, AN 01-1A-1, which covers general working practices, riveting specifications and methods, repair of tubing, metal and fabric patching, etc.—structural repair procedures common to nearly all aircraft. The manual describes methods for repairing most kinds of damage, tells which materials should be used and gives finishing processes for each surface after repair is accomplished, in accordance with normal construction methods.

In addition to the general manual, individual books are published for each kind of airplane and are called *Handbooks of Structural Repair for the Model X Airplane*. BuAer attempts to cover in these manuals all classes of work on structures that are specifically applicable to the particular plane and that are not described in sufficient detail or are not given at all in *General Manual for Structural Repair*.

There is one feature of the books which is considered particularly useful and valuable to operating activities. "Negligible Damage" is defined and limits are declared for damage to every part of the wings, fuselage and empennage. Damage is considered negligible if it can be allowed to remain unrepaired without imposing any restriction on the flight characteristics of the airplane. If damage is rated negligible, the plane can go back into the air immediately. No repair is necessary until time and material are readily available, and the repair is optional even under those circumstances.

The manuals are written to present the simplest satisfactory repair possible in all cases. Where it is feasible, sheet substitutions are given for extrusions. If a part cannot safely be repaired, the book states the replacement required.

A list of the handbooks follows:

BTD-1	AN 01-40AN-3
F4F-4 & FM-1	NavAer 01-85RC-3
F4U-1	AN 01-45HA-3
GB-1, -2	AN 01-90CC-3
GH-1, NH-1	AN 01-170CB-3
JM-1	AN 01-35E-3
JRF-5, -6B	NavAer 01-85V-3
N2T-1	NavAer 01-205QA-3
OS2U-1, -2, -3	AN 01-45DB-3
OY-1	AN 01-50DB-3
PBJ-1H	AN 01-60GD-3
PB2Y-3	AN 01-5E1-3
PB4Y-1	AN 01-5EC-3
PV-2	AN 01-55ED-3
R5C-1	AN 01-25LA-3
R50-1 to 5	AN 01-75C-3
RV-1	AN 01-5CA-3
SB2C-1A	AN 01-25AA-3
SBD-3, -4, -5	NavAer 01-40S-3
SNB-1	AN 01-90KC-3
SNB-2	AN 01-90-3
SNJ-3, -4	AN 01-60F-3
SNV-1	AN 01-50B-3
SNV-2	AN 01-50BD-3
TBF-1, TRM-1	NavAer 01-85WA-3

Devices Catalog Is Issued

Synthetic Training Is Described

More than 100 synthetic training devices available to Navy, Army Air Forces and Allied aviation activities are described in a newly revised catalog issued by BuAer Special Devices Division. This 172-page publication tells the purpose of each device and provides photographs or sketches of training equipment.

Necessary war training in the fields of navigation, bombing, torpedoing, gunnery, aircraft simulation, recognition and range estimation, voice procedure, aircraft arming, communication, maintenance and the making of



NEW ISSUE AVAILABLE AT MAJOR ACTIVITIES

terrain models may be carried on with devices described in this Navy guide. Devices are used also in aero-medical work. Included in this catalog is information about training courses for special devices officers and for men who operate and maintain devices at naval training activities.

Primarily, the new edition provides current information concerning devices now in production and available for distribution. This catalog should be particularly useful to those who wish to order devices and to those who do not have an opportunity to see available equipment in operation. This catalog provides an indication of scope and purpose of the synthetic training program, exclusive of confidential gear.

Reports reaching BuAer from training activities and war theaters reveal a growing use of synthetic training devices both for training of personnel before they operate actual equipment, and as refresher aids in advance bases. The greater the knowledge of how to use training equipment, the better the training. Likewise, the greater the knowledge of training needs, the better the training devices developed. Catalogs have been sent to major Navy,

Army, Marine and Allied aviation activities and commands. Copies are available for reference through training officers or special devices officers.

Air Bombers Get New Aids

Publications Originated by BuAer

Two new publications on bombing have been prepared recently by BuAer's Special Devices Division. These are entitled: "Precision Bombing" and "Briefing Folder for 7-A-3 Horizontal Bombing and Dead Reckoning Trainer."

Although "Precision Bombing" is a manual primarily intended as guide and reference book for all naval aviation activities dealing with the basic training of air bombers, it also may be useful in refresher and advanced horizontal bombing training. It is based on proved methods and technique developed by fleet and shore training activities.

Commenting on "Precision Bombing," DCNO for Air points out that it will be a valuable aid to air bombers not only for their initial but also for their refresher training. The same comment adds that as such the publication should materially contribute to successful prosecution of the war.

The Briefing Folder, a 20½" by 21¼" publication, will be used to brief students on bombing targets before they go on a simulated mission in the 7-A-3 Bombing Trainer. All large photographic reproductions are direct contact prints of aerial photoplates on the 7-A-3. They are exactly the same size and scale as those used on the trainer and may therefore be used to plot a course or mission on the trainer. A number of specific targets have been selected from the terrain available and both vertical and oblique photographs of these are included in the folder. Five aeronautical charts are provided for plotting, all of them identical and similar in scale and marking to a standard chart.

Jet Units Speed Take-Off

Navy Now Ready to Employ JATO

Announcement recently was made that the Navy is now prepared to use jet-assisted take-off for both carrier air-



UNITS RESEMBLE BOMBS BUT FIT ON FUSELAGE

planes and flying boats. These will be known as JATO units and will reduce take-off runs 33 to 60 percent or greatly increase the maximum plane load.

Each jet unit is an engine in itself. It consists of a cylinder filled with solid propellant including oxygen so the mixture will burn without air, an electrically controlled sparkplug and a rocket-like vent from which jet gases give their thrust. The units resemble bombs but are fastened to the fuselage instead of to the wings. Easily mounted and replaced, each unit delivers approximately 330 hp.

With four, six or eight JATO units used in salvo or in series, a flying boat could greatly increase its payload and still take off in the limited area of Pacific island lagoons. This feature is increasingly important as lines of supply and communication lengthen.

As to carrier-based planes, JATO will enable flattops to use more deck surface for aircraft and get a greater number of planes, more heavily loaded, into the air sooner. Planes can rendezvous more quickly and make safer take-offs. As an added feature JATO will enable land based fighters and bombers to utilize island air strips with greater safety.

Salty Dunkers Are Formed Pilots, Crewmen Are Members

USS GAMBIER BAY—Naval rank or rate has no bearing in the Grand Order Of Salty Dunkers aboard this CVE. With a charter membership of 12 pilots and 13 crewmen, this organization insists that all new members be potential "Dunkees" who have abandoned aircraft, as an emergency measure, at sea. Only members of the aviation branch of the naval service are eligible. Charter members' signatures are written into the scroll card and diploma.

Potential "Dunkees" must buy a round of drinks for all members. If, at any time, a "Dunker" is found without his membership card he must buy all members present a drink or undergo some displeasure determined by Dunkers present. Officers of this organization bear the regal, high-sounding titles of the "King Fish" and "Salty Scribe."



GRAND ORDER OF SALTY DUNKERS SIGN DIPLOMA

Navy Aviation Is Featured Flying Magazine Reviews Record

Naval aviation activities and combat achievements are featured in the October, 1944, issue of *Flying* magazine, which completely covers the subject.

Material on which the articles were based was prepared by the Aviation Training Division, Training Literature Section of DCNO (Air), from material submitted by various officers and men of the Navy, Marine Corps and Coast Guard. Photographs were taken largely by officers of the section. The magazine issue covers naval aviation's activities for the past year and a half.



MAGAZINE FEATURES NAVY AVIATION ACTIVITIES

Japs Get Taste Of Cannon New Carrier Type Plane in Action

First cannon-firing warplanes built for aircraft carriers are now in action against the Japanese in the Pacific. These are the Navy's new version of the Curtiss *Helldiver* (SB2C) dive-bomber. The new cannon packing carrier plane helped to swell the score of Navy Air Group One which recently returned from the combat zone after destroying 101 Jap planes in combat, 104 more on the ground and sinking or damaging 38 enemy ships.

These new *Helldivers* are equipped with a pair of 20 mm. fixed cannon mounted on the leading edge of the wing in place of the former armament of 50 cal. machine guns. In addition the plane has flexible machine guns operated by the rear seat gunner and radioman.

In one 48-day period of combat, pilots of Fighting One who carry the nickname of "High Hatters," shot down 101 Jap planes and scored an additional 19 probables. Their biggest day occurred when the Japs attacked a task force in the region of the Marianas. That day the "High Hatters" shot down 37 enemy planes and had six probables

BEST ANSWERS

Historic U. S. Ships

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

1. She was built under the leadership of Joshua Humphreys, commanded by Edward Preble and Thomas Truxton, and defeated the *Guerriere* and the *Java*. She was the—

- a—*Constellation*
 b—*Congress*
 c—*Constitution*
 d—*Chesapeake*

2. Ship construction (and perhaps the course of the war) was changed by a battle which was a draw, in which neither ship was seriously damaged, and not a man was killed. A participant in this battle was the—

- a—*Olympia*
 b—*Merrimac*
 c—*Baltimore*
 d—*McCullough*

3. The first submarine to really sink a ship by means of a torpedo, although she herself was dragged under by the suction, was the—

- a—*Nautilus*
 b—*Turtle*
 c—*Pickrel*
 d—*C.S.S. Hunley*

4. More than one-half her crew was killed when she was sunk at anchor. The sinking was the final step toward our entrance into a war which stamped us a world power. Her sinking became the battle cry of "Remember the—"

- a—*Alamo*
 b—*Texas*
 c—*Maine*
 d—*Iowa*

5. "This return of nine guns was the first which the Stars and Stripes had ever received from a foreign man-of-war!" The proud captain on this occasion was John Paul Jones; the place was Quiberon Bay; The ship bearing our flag was the—

- a—*Bonhomme Richard*
 b—*Alfred*
 c—*Providence*
 d—*Ranger*

6. The aircraft carrier was assured as part of our fleet when Eugene Ely made a successful landing on the—

- a—*Pennsylvania*
 b—*Birmingham*
 c—*Langley*
 d—*Yorktown*

25 YEARS AGO THIS MONTH

Naval Aviation in October 1919

October—The use of the rigid type of airship by the Army and Navy was referred to the Joint Army and Navy Board on Aeronautics. The question as to which service should have authority over experimentation and production of the rigid airships was the subject of long discussion by the Board on Aeronautics. The Navy contended that the development of this type of airship was a Navy function exclusively, and the Army asserted that there were military as well as naval uses for the dirigible ship.

October—The establishment by the Navy Department of a school to train men in the science of aerology, as the exploration of the free atmosphere has been called since 1906, marked one of the big steps taken by the government for the study of this subject, then and now so necessary to the success of aviation.

October 6—The Navy Department proposed both the plan of land-and-water flights to Brazil before the end of the winter, and the first transpacific attempt before June of 1920.

Starting from Hampton Roads, the Brazilian venture was to constitute the first test growing out of the experience gained in the transatlantic flight. The planes, which were to be improved ships of the NC type, were to follow the coast to Key West before crossing

the Caribbean to Rio de Janeiro. The longest leg of this journey was to be 1,000 miles, with stops at Guantanamo, Cuba, Haiti, Santo Domingo, Trinidad and various South American ports. Mother ships, such as were employed in the NC journey from Rockaway to Plymouth, were not to be used.

The transpacific flight was to start at San Diego, with a stop at Hawaii, making the first leg 2,000 miles long, and longer than the NC-4's Trespassey to Azores voyage. One other stop was to be made at Guam. Due to the greater hazards and the longer distances, destroyers from the Pacific fleet were to act as station ships to guide the fliers on their 7,000-mile journey.

The Navy's program for equipping all bases with aviation facilities called for the maintenance of landing places at every naval establishment on both coasts. The aviation division of the Navy Department intended to have stationed at all naval bases sufficient mechanics to care for planes that put in there, as well as providing covered buildings to house these seaplanes. The program likewise called for the expansion of naval aviation to include a full division of seaplanes for both the Atlantic and Pacific fleets. Four major vessels in each fleet would be especially equipped to carry fast scouting planes.

October 6—Recognizing the future of the airplane in the motion picture

world, the Fox Film Corporation instructed their architect to revise the plans of their huge studio in order to provide landing facilities for aircraft.



DE CHEVALIER

October 10—Fifteen Navy officers were ordered to report to Lieut. Comdr. de Chevalier at Carlstrom Field, Arcadia, Florida, for training in land machines. The Army Air Corps gave them permission to use this field temporarily.

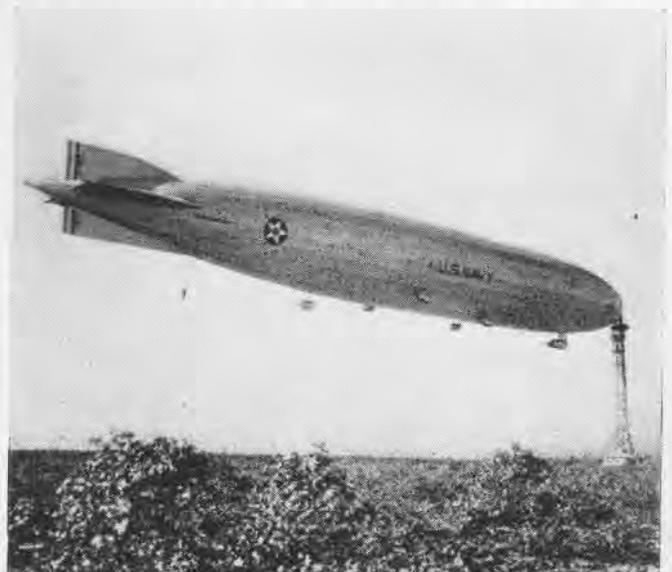
October 13—Lt. Comdr. A. C. Read of the NC-4, the Navy's famous flying boat, received a bicentennial medal from Yale University in honor of his achievement in flying across the Atlantic. In response to the presentation address, Comdr. Read paid tribute to Yale's contribution to naval aviation.

October 13—The officers and crew of the F-5 flying boat, in which King Albert of Belgium made a flight over New York City, October 4, received the Order of Leopold II from the King through Lt. Comdr. Hasler.

October 20—Five naval flying boats carrying nineteen men began a recruiting trip for the naval air service. Three of the craft were of the HS-2 type and two were of the F-5-L type both of which were manufactured at the Philadelphia Naval Aircraft Factory.



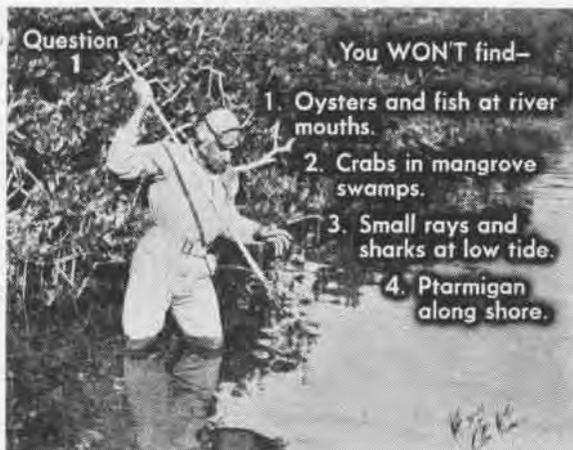
Among the first royal air enthusiasts was King Albert of Belgium who is photographed here ready to take off on one of many flights



A Navy rigid airship moored at the mast at Lakehurst. Both the Army and the Navy claimed authority over these in 1919

Question 1 You **WON'T** find—

1. Oysters and fish at river mouths.
2. Crabs in mangrove swamps.
3. Small rays and sharks at low tide.
4. Ptarmigan along shore.



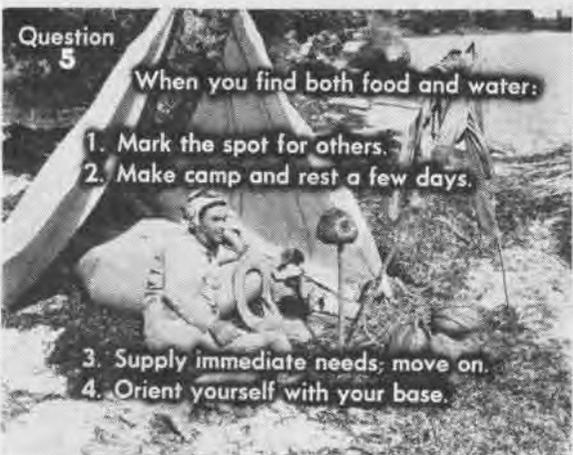
Question 3 Coconut palms are found—

1. Near sea on low sandy shore.
2. On rocky slopes.
3. Usually on high ground.
4. In Tropics only.



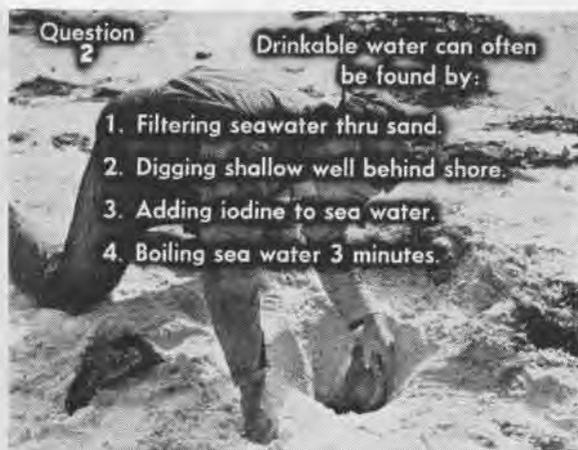
Question 5 When you find both food and water:

1. Mark the spot for others.
2. Make camp and rest a few days.
3. Supply immediate needs; move on.
4. Orient yourself with your base.



Question 2 Drinkable water can often be found by:

1. Filtering seawater thru sand.
2. Digging shallow well behind shore.
3. Adding iodine to sea water.
4. Boiling sea water 3 minutes.



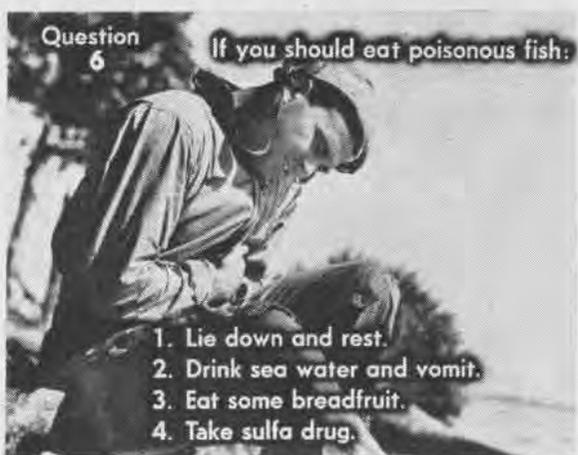
Question 4 **DON'T** hunt shellfish—

1. About 1/2 mile off shore.
2. In tidal pools.
3. In water below tidal zone.
4. Along beach.



Question 6 If you should eat poisonous fish:

1. Lie down and rest.
2. Drink sea water and vomit.
3. Eat some breadfruit.
4. Take sulfa drug.



LACK of a little seashore survival knowledge can be a dangerous thing. Unless you're one of those unheard-of individuals who can manage to wade in through surf to a populated beach even in the Central Pacific, some do's and don'ts of seashore procedure are a necessary part of your survival gear. Since survival means eating and drinking, check your knowledge on these questions. If you have the word, your chances of surviving are excellent. See page 40 for answers.

[QUESTIONS FROM BUAKR SPECIAL DEVICES VISUAL QUIZZER FILM NO. 58, SURVIVOR AT SEA]

Write your answers here

- | | |
|---------|---------|
| 1. | 4. |
| 2. | 5. |
| 3. | 6. |



14 HAWAIIAN ISLANDS



COM-14
NAB
Pearl Harbor - Pearl Harbor

16 PHILIPPINE ISLANDS



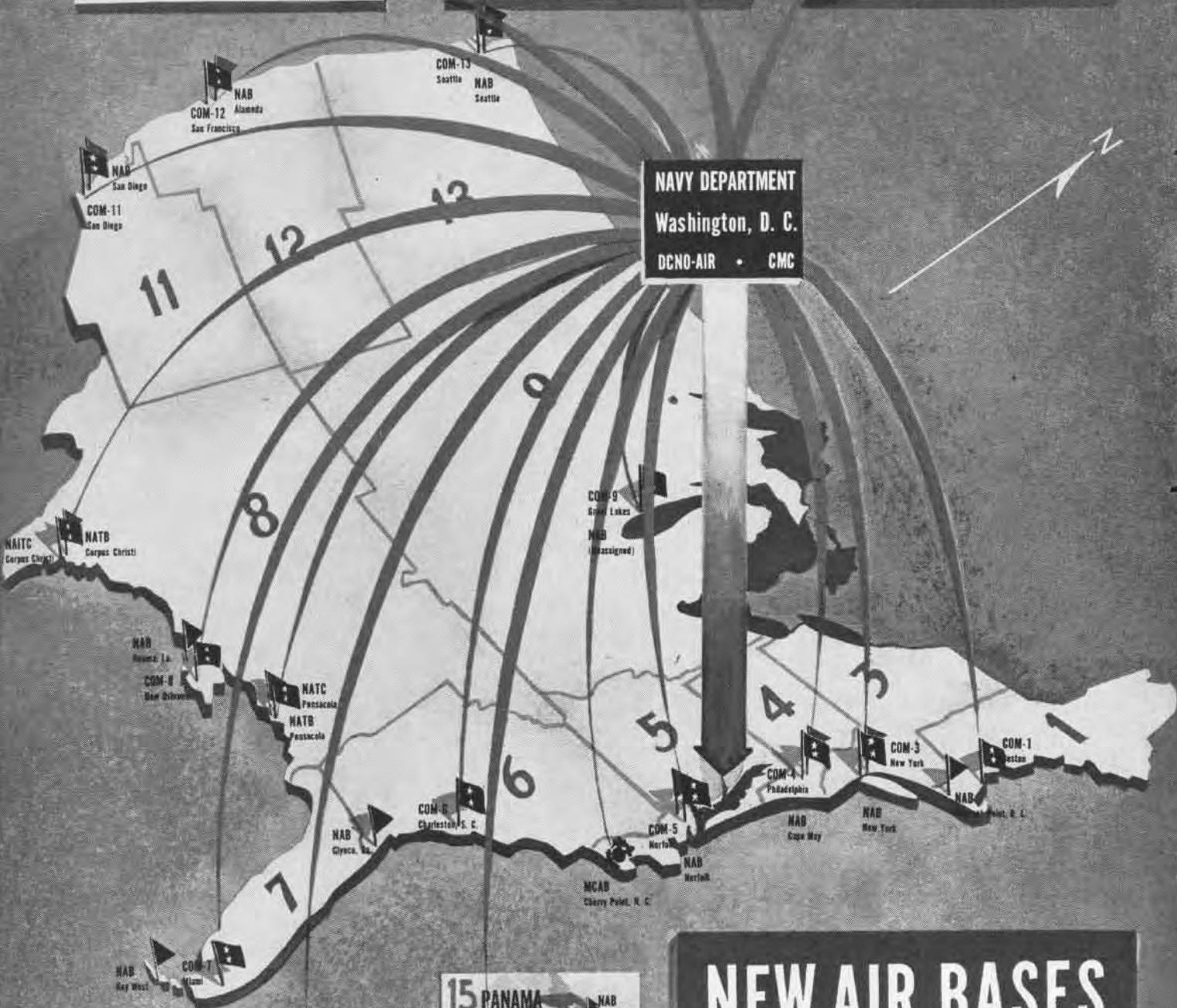
Manila

17 ALASKA



COM-17
NAB
Kodiak Island

NAVY DEPARTMENT
Washington, D. C.
DCNO-AIR • CMC



10 CARIBBEAN AREA



COM-10
NAB
San Juan

15 PANAMA



COM-15
NAB
Balboa

NEW AIR BASES SET-UP BY NAVY

A far reaching development in administration of the Navy is depicted here. Air Bases answer the problems growing out of a tremendous war time expansion.

AIR BASES ARE CREATED IN ALL DISTRICTS

In a far-reaching move directed at complete coordination of shore establishments supporting Navy and Marine Corps flying activity, the Secretary of Navy has issued General Order No. 210 which designates as Air Bases all seven of the existing Naval Air Centers and extends the Air Bases concept to the rest of the naval districts. In this fashion the Navy has met the administrative problems which grew out of tremendous war-time expansion in naval aeronautical activity on land. Naval Air Bases are not an overnight development. Nor was this new concept in air administration adopted without actual field test, for the Air Center system had served as the advance testing ground.

Evolution of the Air Bases might be said to date back nearly two years. Wartime America, launching its drive for the victory which is now in sight, called upon its Navy for an expansion in air power without precedent. The fleet which in peacetime had served as training ground of squadrons and air groups was devoting its energies to war and all shipboard training had to be assumed by shore establishments. A terrific expansion in training facilities ashore was demanded. New stations sprang into existence and began training pilots before the last of the concrete had set. These grew into still larger stations and as the need arose smaller satellite stations steadily came into existence around them.

Air Center Is First System Adopted

Soon the major stations became the hub from which radiated intense activity spreading out for miles over the adjacent area. New administrative problems arose and out of these grew the concept of an Air Center designed to function as an over-all command. In October, 1942, General Order No. 181 was issued which as amended, and with No. 188, created the Air Centers as a coordinating unit in the Navy's chain of command. Centers were created at Norfolk, San Diego, Seattle, Pearl Harbor and Alameda. In addition, that order established two Naval Air Training Centers, one at Corpus Christi and the other at Pensacola.

Each of the new Air Center commands had its own commandant whose function was to tie together activities of the various naval aviation shore stations assigned to his command. The Air Center concept proved out in practice but soon other areas began to show the need of similar coordination. Out of this growing need came the new General Order No. 210 changing the name of Naval Air Centers to Naval Air Bases and expanding the program to every one of the naval districts. The new order creates three types of commands. These are: Naval Air Bases, Naval Air Training Bases and Marine Corps Air Bases. Coordination was best served by these three classifications.

NAVAL AIR BASES have administrative jurisdiction over all naval air stations within their respective districts and are under the commandant of the naval district in which their headquarters station is situated. The order provides that a line officer (Naval Aviator) shall serve as Commander. If there are two or more Marine Corps air stations in the district or a like number of other Marine Corps activities a Marine Corps officer is added to the command staff to act as a deputy, in command of such stations or activities. The General Order makes exceptions to the scope of influence in three districts. Some non-continental activities in the Tenth District are assigned to the Seventh. Some insular activities outside the area of the Fourteenth are added to its jurisdiction. All naval aviation shore activities within the limits of the Panama Sea Frontier go, by the specific terms and provisions of the Gen-

eral Order, to the Naval Air Bases, Fifteenth District.

No shore activities which were assigned already to the Naval Air Training Command and its subordinate commands are included under the Naval Air Bases command. Other excluded activities are those assigned to the Naval Airship Training and Experimental Command, the Naval Air Technical Training Command, the Training Task Force Command, the Potomac River Naval Command and the Severn River Naval Command, Naval Air Material Center of Philadelphia and the United States Marine Barracks at Quantico and Parris Island. Headquarters air stations for the new Naval Air Bases have been designated by the Chief of Naval Operations under authority of the order.

District Headquarters Are Designated

By district, the NAB headquarters are: First, Quonset Point; Third, New York; Fourth, Cape May, N. J.; Fifth, Norfolk; Sixth, Glynco, Ga.; Seventh, Key West; Eighth, Houma, La.; Ninth, not yet named; Tenth, San Juan, P.R.; Eleventh, San Diego; Twelfth, Alameda; Thirteenth, Seattle; Fourteenth, Pearl Harbor; Fifteenth, Coco Solo, C.Z., and Seventeenth, Kodiak, Alaska. The chain of command for a naval air station under the new system first would lead to NAB, next to district commandant, thence from COM to the Navy Department. Because air station activities assigned to the Air Functional Training Commands already were well coordinated by these commands the General Order continues the status of these activities without any change and they remain outside of the NAB organization. The Naval Air Training Centers which were located at Corpus Christi and Pensacola became NATB commands with no changes in their location, organization or function.

THE GENERAL Order provides that a line officer (Naval Aviator) shall be commander of these bases. His title, as an example, would be: Commander, Naval Air Bases, Fifth Naval District. NATB is not under the jurisdiction of the COM except on matters coordinating the general plan of military defense within the district. The NATB Commands are placed under the Intermediate Training Command at Corpus Christi. Chain of command progresses from NATC to the Naval Air Training Command, Pensacola, and thence to Washington, D.C., and the Navy Department. The third general class of air bases is the Marine Corps command under the Commandant of the Marine Corps. The Commandant has direct jurisdiction.

Order Is Invested With Flexibility

The General Order established only one Marine Corps Air Base with various auxiliary facilities in the area. Headquarters and the main base are located at Cherry Point, N.C. All other Marine Corps activities are unaffected. As is true of Training Bases, the Marine Corps Air Bases command has jurisdiction over a more limited number of stations and fields than are assigned to such NAB commands as the First, Eleventh, and other large districts.

The General Order specifies that a Marine Corps officer (Aviator) who holds suitable rank shall serve as the Commander of the Marine Corps Air Bases. As a measure designed to lend flexibility to the new General Order, special powers are vested in the Chief of Naval Operations. A clause in the order itself gives him specific authority to assign aviation shore activities to the commands and designate headquarters air stations from time to time. By this means the order anticipates any contingency so that future requirements can be easily met with a minimum of delay.

PROPER FUZE FOR ROCKET ADDS PUNCH

ROCKETS have been reborn as a military weapon in this war. Limited use of rockets in combat by carrier squadrons has already indicated they are one of our most effective airborne weapons. Technical data on aircraft rocket ammunition assemblies contained herein is from BuOrd Circular Letter AV 21-44.

To sink a submarine, an H.E. rocket must be detonated in contact with pressure hull. Since upper deck or saddle tanks will initiate fuze action before pressure hull is reached, nose fuzed or non-delay base fuzed rockets are less effective against subs. Five-inch rockets with nose plugs, or nose fuze inoperative, may breach a sub's pressure hull. In any case above water hits will be required, since both nose and base function upon impact with water. Developed for anti-submarine use, 3.5" body rockets will penetrate a sub's pressure hull even after considerable underwater travel.

Depending on speed of firing aircraft and range, 5.0" H.E. rockets will inflict serious damage to armor plate from ¾" to 1" thickness. Velocity is such that serious damage is not likely in plates thicker than 1". Maximum penetration is obtained by using steel nose plug and delay base fuze Mk. 157. Solid 3.5" rocket bodies of non-heat-treated steel



HELLCAT ABOARD USS TULAGI TAKES ABOARD ROCKETS FOR AERIAL STRIKE AGAINST NAZIS

tend to deform badly or shatter upon impact.

Five-inch rockets with explosive bodies fuzed with nose fuzes and/or non-delay base fuzes are not expected to cause more than superficial surface damage to concrete slabs of appreciable thickness. Solid body 3.5" rockets and 5.0" rockets with delay base fuze and steel nose plug (or nose plug set safe)

are effective against reinforced concrete. Penetration is about identical. Thickness of slab which will be completely penetrated varies with conditions of firing. Average may be taken as 2 ft. at normal obliquity, and 1½ ft. at 30 degree obliquity. Depth of penetration in massive slabs is about half above.

This information is preliminary, more complete data will be published later.



CORSICA-BASED HELLCAT LOADS ROCKETS FOR FRENCH INVASION

FORWARD FIRING AIRCRAFT ROCKET AMMUNITION

BODY			Fuze	Motor (3.25")	Wt. of Body Loaded & Fuzed Lbs.	Wt. of Complete Round Lbs.
Diam.	Mark	Filler				
3.5"	1, 2	Solid	None	Mk. 6, 7	20	53
3.5"	8*	Solid	None	Mk. 7	20	53
5.0"	1	8.4 lb. TNT	NF Mk. 148	Mk. 7	44½	77½
	"	"	NF Mk. 149	"	40	79
5.0"	1	7.9 lb. TNT	NF Mk. 148			
	"	"	BF Mk. 146, 157	Mk. 7	49½	82½
	"	"	NF Mk. 149			
	"	"	BF Mk. 146, 157	"	50½	83½
	"	"	Nose Plug			
	"	"	BF Mk. 146, 147	"	50½	83½

* Nose fuzes Mk. 148, Mk. 149-air arming fuzes detonate upon impact; may also be fired safe and should then not detonate under any condition of impact. Base fuze Mk. 146 arms by propellant powder gas pressure; fires upon impact with slight inherent delay. Base fuze Mk. 157 is similar to Mk. 146 but has .02 second delay element. ** Performance of Motors. Mk. 6, Mk. 7 are considered as identical in this article.

SHORE STATIONS

▶ **NAS JACKSONVILLE**—An opportunity for service personnel and civilian workers to pursue standard college courses of freshman and sophomore grade by attending classes two evenings per week has been offered by the president of the Jacksonville Junior College. The two-day-a-week semester has been made possible by lengthening each class period, so that the required number of hours will have been accumulated by the close of the semester.

▶ **NAS SOUTH WEYMOUTH**—Recently some men were needed at the main station to help land a Blimp. A Blimp Officer went back to the hangar to draft some volunteers. He rounded up fourteen Hedron men and they all went back to the field. Upon arrival, the landing officer said, "Fine, but you didn't have to run. You should have taken some sort of transportation." A voice replied, "We did. We're on a Jeep!"



▶ **NAS MIAMI**—The station theatre was crowded and a devoted couple had finally accepted single seats. The young lady, however, didn't care for the arrangement and tried to remedy matters. It occurred to her that her neighbor, a veteran CPO, might be willing to exchange seats with her escort. Accordingly, she leaned over and whispered: "Pardon me, are you alone?" The prudent chief gave no sign of having heard, so she asked the question in a louder tone, at which time the chief turned slightly toward her, but kept his eye on the screen. "Cut it out, sister," he whispered savagely, "my whole darned family is here tonight."

▶ **NPFS ST. MARY'S COLLEGE**—Prior to the official announcement of the Navy's revised V-5 program, the following story gained wide circulation. "Do you know what they're going to do with us?" said one cadet. When the answer was "No," he replied, "They're going to send us to the Ford plant, ram three pistons down our throats and make us V-8's."

▶ **NATTC NORMAN**—An AMM2c, stationed here after service overseas, doesn't know just what it proves about the Japanese, but here's his story as it happened. On his way back to the States recently after serving with a torpedo bomber squadron as a turret gunner, he was assigned for a time to a ship carrying Japanese prisoners.

One day when the Japs were being aired on the deck, he noticed one of them looking around incredulously at the American warships which extended as far as the eye could see in several directions. It was part of the Navy's gigantic Task Force 58.

The Jap took a long look, a deep breath and then said in pure American: "Oh, my gawd!"

It developed that he was a graduate of the University of California. His name was something bordering on Sukiyaki, and he had a sense of humor—in a grim sort of way. "We noticed that another Jap, a little guy and very young, was scared silly about something," continued the AMM2c. "His hands shook, and he walked around as though he were in a trance. His eyes never left the deck. Finally, we found out what was the matter with him. Sukiyaki had told him that all the prisoners were being taken to New York City where they were to be beheaded at a war bond rally."

▶ **NAS BRUNSWICK**—A WAVE was pensively watching a blimp cruising over the station. "What would happen if its engines stopped?" she inquired of her male companion. "Nothing," he replied, "it would just drift." "But supposing he wanted to come down," she persisted. "Oh, he'd just valve out some gas," answered her informant, "and down he'd come." The WAVE thought for a minute and then said, "You mean straight down like a heliotrope?"

▶ **NAS NEW ORLEANS**—A Bkrlc was the first enlisted man to receive recognition under a new program initiated at this station. His commendation read as follows: "For exceptionally meritorious services as a morale builder at the Naval Air Station, New Orleans, since October, 1942, having furnished the personnel of this station with superior bread and pastry. His interest and attitude have inspired the men who work for and with him, and the products of the bakery shop have brought forth praise continually from the personnel of this activity. As a baker who learned that trade while serving aboard the USS *West Virginia* during a tour of duty at sea, he has demonstrated consistently his superior ability and a keen desire to make his shipmates happy with the products of his talents." The new program honors outstanding personnel who are making an extra contribution to efficiency or well-being.

▶ **NPFS ATHENS**—Before an enthusiastic audience of wheelchair patients at the Warm Springs Foundation, Georgia's institution for Infantile Paralysis treatment, five outstanding swimmers, selected from

the Athens Pre-Flight APT Battalion, staged an aquatic demonstration a short time ago. The paralysis patients watched with great interest, particularly when it was demonstrated that it is possible for a person to swim even with his arms or his legs disabled. The main purpose of the show, however, was to provide entertainment of an educational nature based on the wartime uses of swimming.

▶ **NAS NEW YORK**—The familiar train announcement, "Change at Penn Station!" took on a new meaning last month with



the opening of a nursery at the station. The pink-walled service station for babies is proving a real boon for Navy men, their wives and children. The nursery is equipped with

cribs, high chairs, bathing facilities, an electric stove for heating bottles and a refrigerator for cooling them. The railroad supplies washcloths, towels, oil, powder, disposal diapers, etc. The nursery is open to children up to six years of age, from 7:30 a.m. to 12:30 a.m. Small babies have priority during rush hours. Children staying more than a few minutes are logged in a registration book. A child's stay is limited to about two hours. Parents or guardians must stay with them all that time, except for 15 minutes' grace to buy tickets or check schedules.

▶ **NAAS GREEN COVE SPRINGS**—A seaman 2c blinked, rubbed his eyes and looked again at the airplane motor upon which he was doing repair work in Hangar 19. Yep, there it was—his name scratched clearly into the rocker-box of the FM-2 *Wildcat*, just as he had put it there six months before when he was doing war production work in the Eastern Aircraft plant at Linden, N.J. He enlisted in the Navy soon afterward, went through boot camp at Bainbridge, Md., and has been stationed here for over a month.

▶ **NAS MIAMI**—"Right is might" according to a member of one of NAS Miami training units. It seems that he was shopping around for a radio to lighten the hours in his jalopy, but they were all too expensive. So, as a last resort, he stole into the night and "borrowed" a radio from a car which was being dismantled in a vacant lot. Nobody was the wiser. But wives are a curious lot, and his proceeded to delve into the question of "How Much?" He stalled and talked about the weather, and finally she asked him how much he thought it was worth. He gave her a conservative answer and forgot the whole matter. The following Sunday at church, his wife put \$30 in the collection plate.



▶ **SO. PAC.**—An ordinary, GI china coffee cup is one of the most treasured souvenirs of a Marine aviation unit on the womanless island of Bougainville. Nostalgic Marines have it on prominent display, suspended by a string in the officers' mess. The cup, unmistakably marked by scarlet lipstick, was used by a flight nurse who was a dinner guest when her hospital plane made a brief stopover on the island.

▶ **NAAS GREEN COVE SPRINGS**—Most girls dream about the time they led the Junior Prom or were voted the best jitterbug in school, but one WAVE will always treasure the memory of a Friday inspection. While she was stationed at NAS Jacksonville, she acted as chauffeur for an admiral. While inspecting the WAVES one Friday, the admiral recognized her and paused to chat.

▶ **NAS PEARL HARBOR**—Somewhere in the States is a young bride whose husband is fond of chocolate cake. With his birthday approaching, she was faced with the problem of providing him with a nice fresh cake for the occasion. And it was a problem, because he was far from home, stationed on Ford Island with the Navy Seabees. A long trip through the mails wouldn't do a chocolate cake much good. Finally she hit upon a solution.

An airmail letter, containing an unusual request, arrived at the office of the chaplain. Would he please see what he could do about getting one chocolate birthday cake to one MM2c on a certain Sunday? Not having his recipe book handy at the moment, the chaplain relayed the message to the Seabee unit's executive officer. The latter, in turn, enlisted the services of a Bkr1c, who whipped up a four-pound masterpiece, properly inscribed.

▶ **NATTC NORMAN**—The fire department was a little bewildered when they were called out to fight a fire raging in "Building 5." Not only could they not locate the fire, but they couldn't even find the building. Later they sighted it perched aboard a trailer-truck. Actually it was a surprise alarm to test their ingenuity.

▶ **NAS CORPUS CHRISTI**—An organization known as the "Naval Order of Wise Old Owls" has been established for naval flight instructors who have completed 500 hours of instruction without an accident or violation of training rules. The membership is retroactive. If a pilot damages a plane or violates any training rule during a 500-hour period, he is fined from 5 to 50 hours of flight time credit, depending upon the decision of the board of governors. Head of this board of governors is the Senior Owl, any instructor in the squadron having the highest merit rating at any given time. A new senior takes over as merits accumulate.

▶ **NAS GROSSE ILE**—The Navy is now making use of the lowly tin can to teach beginners how to swim. Salvaged No. 10 cans are soldered together and attached to a strap that may be fastened around the body in any position. The result is a perfect pair of water wings which gives confidence to a fledgling while he learns.

TOKYO TALKS

—TO JAPAN

An indication of a severe food shortage in occupied Asia was contained in a recent Japanese Domei agency dispatch suggesting a new recipe for ersatz bread and cakes. In a Romanized Japanese-language dispatch to the press, Domei suggested that the natives make bread from "powdered tea grounds, Chinese wormwood, and the leaves, stalks and peelings of different vegetables and plants." Domei also pointed out that flour could be extracted from mulberry bark. It suggested that "the residue" be dried and pulverized to yield "a substitute for flour."

—TO AUSTRALIA

The Tokyo radio declared in an English-language broadcast to Australia that some Japanese soldiers, hiding out on Guadalcanal Island, had recently returned

to a Japanese base in the central Pacific by a submarine which they captured from the enemy. These soldiers brought word that other Japanese army men were still on the island carrying out guerrilla activity. These soldiers have returned to Guadalcanal, presumably aboard the captured submarine, carrying a load of ammunition.

—TO JAPAN

According to Tokyo, 40 Japanese residents of Paris declined to be evacuated with other Japanese nationals from the French capital. One hundred other Japanese, including the Paris embassy staff and Japanese newspapermen, had been evacuated to Berlin "in view of the seriousness of the times."

—TO THE UNITED STATES

The Japanese Domei agency distributed a memo recently to its bureau chiefs in occupied East Asia informing them that the "puppet de Gaulle regime plans to send an expeditionary force to East Asia to cooperate with the British and American armies now battling Japan." The bureau chiefs also were told that the plan "appears to be highly ridiculous" because the "puppet French army, which only now has climbed on the bandwagon and joined the British and American armies in France, has not sufficient reserve forces to send a large expeditionary army to East Asia."

—TO JAPAN

It was announced recently that those who are one year younger than the age requirement for admittance to the Naval Academy will be admitted to the new naval cadet training system. Officers' training will be given to men from as early an age as possible and education will be strengthened. Applications for enrollment in the new cadet corps will be accepted between August 15 and early fall, examinations are to be held at the end of the year, and admission will take place sometime during the following year.

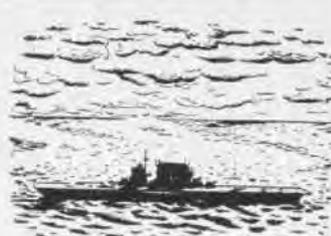
—TO OCCUPIED AREAS

The Japanese Information Board last week issued a communique on "friendship." It was all part of an intensified propaganda drive launched by the Japanese in conjunction with their military offensive in China's Honan and Hunan provinces. The Information Board communique, which reiterated the Japanese word-picture of the "Greater Asia Co-Prosperity Sphere" and professed Japan's "friendship" for the Chinese, was timed to coincide with China's "Big 7" anniversary, commemorating the end of the seventh year of the war with Japan.

—TO JAPAN

The Japanese Domei agency announced recently that Emperor Hirohito entertained ex-Premier General Hideki Tojo and members of the former cabinet at a luncheon at the palace. After the luncheon, all members retired from the Phoenix Hall in the Imperial Palace to another chamber where the Emperor entertained again at tea. Tojo and all the ministers were deeply moved by this honor and with trepidation retired from the Palace.

SHOW ME THE WAY TO GO HOME



Geographic Sector Search

You depart at flight altitude of 8,000 ft. from over Gasparilla Island, lat. 26° 42' N, Long. 82° 16' W, at 1000 to search a geographic sector from 270° to 300° to a maximum distance, returning at 1400 to Carrier "X" which at 0930 was bearing 204°, 49 miles distant from Gasparilla Island on course 174°, speed 18 k. CAS 119 k. Air T (+) 1°. Wind is from 275° at 28 k. Mean variation is 2° E.

1. What is the course and speed of the fictitious ship?

Course
Spd

2. What is your MH, 1st leg of search?

.....

3. What is your MH, 2nd leg of search?

.....

4. What is your MH, 3rd leg of search?

.....

5. What is your TTT at the end of 1st leg?

.....

6. What is your TTT at the end of 2nd leg?

.....

(ANSWERS ON PAGE 40)



PILOT TRAINING

Naval aviation alters its pilot training program to conform to the fleet's needs for new aviators. With the attrition rate in combat falling below anticipated figures, a revised program is installed to turn out the best trained men possible, providing them longer and better training for action

AVIATION PILOT TRAINING PROGRAM

HIGHER PILOT standards and increased emphasis on the advanced stages of training feature the revised program for turning out naval aviators, designed to meet future needs of the fleet.

Improvement of pilot quality is to be achieved by:

1. Raising standards required for successful completion of each successive stage of pilot training.
2. Improving quality of instruction at all levels.
3. Increasing time in advanced stages of training.
4. Coordinating and integrating all instruction in each stage of training, and each stage with the next.

One of the main reasons why the Navy is able to revise its pilot-training program and give its men better training is that the rate of survival in battle areas is one-third greater than had been anticipated.

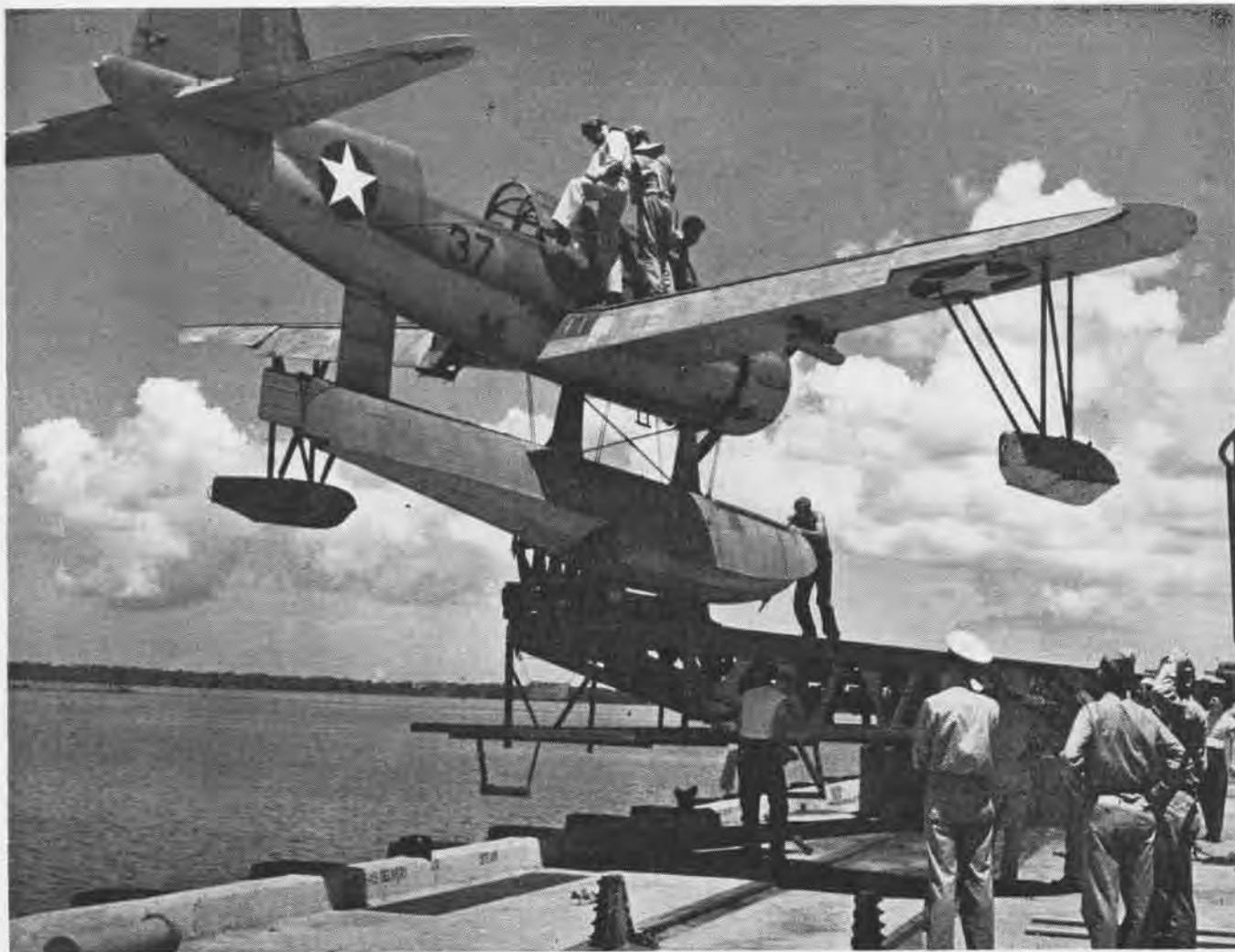
Their fighting qualities, superior training and better equipment have enabled Navy pilots to knock down Jap fliers in aerial combat at a rate often better than five to one. The Navy's original pilot-need plans were ultra-conservative, to allow a margin of safety in case combat losses exceeded estimates. Along with the reduced

training program, the Navy has cut plane production.

Reduction in the output of pilots has been scheduled through two means: 1. smaller intake, and 2. release of some men already in training in preliminary stages. Entries from pre-flight to primary flight are reduced to about one-third of the previously scheduled rate of entry. Civilian procurement has been discontinued.

Release of men in good standing became necessary in early phases of training. These men were given "good standing" reports in their service records and options.

MANY ELECT to stay within the aeronautical organization, either as aircrewmembers or as seamen on new carriers. Those with previous training in the V-12 college program can complete their training under that program as officer candidates. This will lead to commissions in non-aviation branches of the service. Those with two years of college can enter training as reserve midshipmen, with ultimate commissions as deck officers. Students may elect to serve as enlisted men in non-aviation ratings of the Navy or withdraw completely.



OBSERVATION AND CRUISER SCOUTING SQUADRONS, FORMERLY TRAINED AT JACKSONVILLE, ARE NOW LEARNING TO FLY OS2U'S AT NAS PENSACOLA



Longer aviation training for Navy cadets will make better pilots upon graduation. Battle casualties are below estimates

NEW PROGRAM GIVES PILOTS MORE TRAINING IN PRE-FLIGHT PHASE

OBJECTIVES of the new program will be to turn out fewer pilots, better trained by longer periods in advanced flight schools. Output is geared to the needs of the fleet.

Under the revised program, students who enter naval aviation as enlisted men will spend 16 weeks receiving academic refresher courses to polish them up on mathematics, physics, and English before beginning the standard 70 weeks of pre-flight, primary, intermediate and operational.

The 17 flight preparatory and 89 CAA-WTS schools have been closed down and their work turned over to pre-flight schools, which are lengthening their course of training from 12 weeks to 26 weeks.

At the same time, primary flight has been lengthened from 12 weeks to 16 weeks. Intermediate formerly ran on a 16-week syllabus. This is lengthened to 20 weeks. Present plans contemplate lengthening the eight-weeks operational

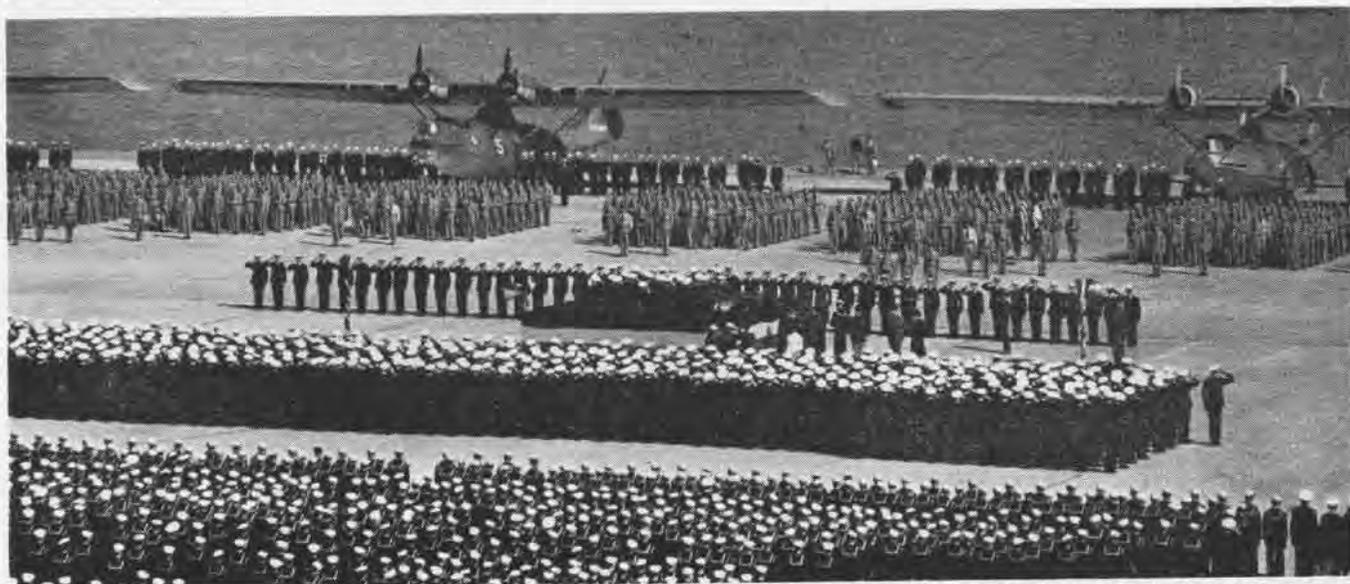


Cadets get first chance to fly planes when they reach primary base. Under old program they flew small planes in CAA schools

syllabus to 12 weeks by the second half of 1945. The lengthening will be made gradually.

The naval aviation training program at one time was turning out more than 2,000 pilots a month, but under the cut-back it will turn out lessened numbers as the war's needs grow less. As this number drops, changes in stations which teach various phases necessarily will have to be made. Some will abandon training entirely and engage in other aviation activities. Use to which these stations are put will be determined individually as they are closed. Some will be used for forming or reforming squadrons, others for storage of planes or other work, as dictated by changes in the training program as the war progresses and pilot needs change.

FOR MANY MONTHS, the United States has been training pilots for Allied nations, to augment their own pilot output. This training falls into three general categories: 1. British—Both Royal Navy and Royal Air Force men who entered at the primary stage. The RAF program now has been terminated. 2. French—Navy student pilots who enter in the pre-flight stage. 3. Latin-American—Pilots from many nations of Latin America get training at Corpus Christi.



GRADUATION SCENES LIKE THIS WILL BECOME SCARCER AS NAVY TRAINS FEWER PILOTS TO FILL THE FLEET'S NEEDS FOR CAPABLE FIGHTING MEN



First ship deck landing by plane made by Eugene B. Ely on the U.S.S. *Pennsylvania* in January, 1911. Ely first Navy instructor



Contrast the plank landing deck on the *Pennsylvania* (left) with this well-ordered carrier deck today with its rows of Avengers

WORLD WARS BOOM NAVAL PILOT TRAINING TO MEET FLEET NEEDS

ONE OUTSTANDING thing about naval aviation training, from the day Glenn Curtiss taught the first naval pilot how to fly back in 1910, has been that it never has been static. The program has its ups and downs, in peacetimes and in war, but the keynote always has been to turn out the best-trained pilot possible under existing conditions.

In the rush of preparation in early days of the war, pilot training was speeded up to turn out as many pilots as possible. At the outbreak of hostilities, 600 pilots a month were joining the fleet. This number rose to more than 2,000 a month. Now the trend is downward again as pilot-needs slacken. Schools and stations are tapering off training.

In the peaceful years, during the 1920's and 1930's, all pilot training was done at Pensacola, the Navy's largest air center. When the flier graduated, he was sent directly to a fleet squadron to learn what he now learns in operational training.

In these squadrons, new aviators gradually were absorbed by training them in service-type airplanes. Operational training to these fliers was slow because squadrons had to carry out their regular operating schedules. New pilots were somewhat in the way. Experienced men were handicapped by having to leave their work to indoctrinate the neophytes, thus handicapping their own squadron training.

THE SYSTEM was workable so long as the number of new pilots was small and need for them was not urgent. When the war broke out, advanced training groups were established at Norfolk and San Diego to give operational training to carrier pilots. With announcement of the enlarged pilot training program by the President, it became obvious that these two groups could not handle more than a small percentage of the newly designated naval aviators. It also was necessary to train them in other than carrier types.

So the Navy changed its program and established operational training at Jacksonville in May, 1942, to give two months of training. This relieved squadrons of the job of making fighting pilots out of their own Pensacola graduates.

The first aviation training came when Glenn Curtiss of-

fered to train a pilot free, back in 1910, if the Navy would order a plane. Lt. Theodore G. Ellyson was selected to be that man. At San Diego, the first camp was set up with three planes and a mile-long runway. Here Eugene Ely and Curtiss taught Ellyson to fly. Later, Ely was the first man to take off or land on a naval vessel.

The next year the Navy ordered a plane from Wright brothers, with the stipulation they had to train a pilot. Thus Lt. John Rodgers became Naval Aviator No. 2. Lt. John H. Towers was trained by Curtiss and the Navy soon had three pilots but no planes yet delivered.

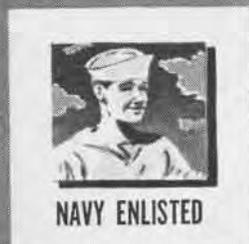
The first naval aviation camp was across the river from Annapolis, with two Curtiss and one Wright pusher planes. Gradually, the Navy assigned a few more men to learn to fly. In January, 1913, the aviation unit went to Guantanamo Bay to operate with the fleet, training new cadets at the same time. Flight requirements to become a pilot were not set up and a student soloed as soon as the teacher thought he could get away with it.

Pensacola became the first naval air station, established in 1914 with Lt. Towers heading the flight school. Pilots first learned to fly a plane, then learned naval aspects of flying. Training began in earnest and some of the school's personnel flew many missions scouting enemy positions in the short-lived war with Mexico.

The outbreak of World War I bled the flight school of its key men, who went off to observe aviation's new role in warfare. Training dropped off. With entry of the U.S. in the war, however, the program boomed again. Naval Reserve men in large numbers began to get flight training, including the now famous Yale unit. Beginning training was at Miami and advanced at Pensacola. Men trained as ground officers or pilots. Later, Long Island, Key West and San Diego were added to preliminary training to speed the program.

WHEN THE war had started, naval aviation was pretty small. It had 17 planes in 1915. This grew to 39 pilots and 54 training planes in 1917. At the war's end, the Navy had 2,127 planes and 1,656 aviators, 825 of them overseas. Aircraft carriers were unknown in that war and naval aviation's principal job was anti-submarine patrols off the American and European coasts. The Navy had 22 air bases abroad and 21 stations or schools in the U.S. Fliers often lacked planes overseas, so they went to specialists' schools when they were not convoying or patrolling oceans.

NEW PILOT TRAINING PROGRAM



NAVY ENLISTED



ACADEMIC REFRESHER



V-12

An illustration showing two figures performing physical training exercises, one on a high bar and one on a pommel horse.

PRE-FLIGHT
26 Weeks



NAVY, MARINE
CORPS OFFICERS

An illustration of a biplane flying in the sky.

PRIMARY
16 Weeks

An illustration of a monoplane flying in the sky.

INTERMEDIATE
20 Weeks

An illustration of a biplane flying in the sky.

OPERATIONAL
12 Weeks



FLEET



SHORE BASES

NANews Chart



AVIATION CADETS GET STIFF PHYSICAL COURSE

FOUR PRE-FLIGHT schools at St. Marys, Iowa City, Chapel Hill and Athens continue to give aviation cadets more or less the same training as before but under the revised program they have also taken over training which formerly was given at flight preparatory and CAA-WTS schools. To accomplish this the 12 weeks formerly given at pre-flight are being lengthened to 26 weeks of training to permit the enlarged course of study to be taught.

Purpose of pre-flight is three fold: 1. To bring trainees into top-notch physical condition, 2. to provide thorough indoctrination, and 3. to give preliminary ground training.

A systematic physical training program has been developed especially for the prospective pilot. In addition, men get training in how to relax and learn how to survive on land or sea. At the same time, the pre-flight schools simulate as nearly as possible the discipline of the Naval Academy. Entering cadets are organized into a regiment.

Ground training includes celestial navigation, communications, essentials of Navy service, recognition, aerology, gunnery, seamanship and first aid. Principles of engines, CAA regulations and principles of flying are taught.

In the physical training end of the program, the students get a wide variety of sports—swimming, gymnastics, soccer, military track, hand-to-hand combat, football, wrestling, basketball and boxing. All help bring them into good condition.

UNDER THE gunnery phase they learn about explosives, fuzes, bombs, gun cameras, torpedoes, range estimation, ship armaments, machine guns and sights. Navigation embraces tracking and use of the Mk III board. In communications classes they learn radio code, blinker, flag hoists.

Men from the fleet who would be entering the pilot training program without immediate contact with mathematics and kindred subjects are first sent to academic refresher training for 16 weeks. They are given review in mathematics, physics and English. Schools which formerly gave flight preparatory work, selected to give refresher work are Louisiana State Normal, Wooster College, Monmouth College, St. Olaf, Murray State Teachers, Cornell College, William Jewell College and at the California Polytechnic School.



Pre-flight schools still give aviation cadet plenty of physical training along with his indoctrination and ground training



Swimming ability has saved many a naval pilot's life after he was forced down at sea. Men can use pants for life preservers



AVIATION CADETS UNDER NEW PROGRAM FLY PLANES FIRST IN PRIMARY TRAINING SCHOOLS. 'YELLOW PERILS' FLY FORMATION AMONG CLOUDBANKS



PRIMARY SCHOOLS GIVE STUDENTS FIRST FLYING

THE CADET has been in naval aviation 26 weeks before he gets in an airplane, but when he reaches the primary training phase his 16 weeks contain plenty of flying. He will make approximately 75 flights and put in more than 100 hours in the air, under dual controls or soloing the N2S.

He studies the same general things as in pre-flight, except that they are expanded and he now gets, in primary, the "post graduate" course. He goes deeper into flying principles. His gunnery classes are expanded to include pyrotechnics, bomb-loading equipment, boresighting, aerial warfare and rockets, with more shooting of small arms thrown in.

In navigation, he gets flight plotting problems and radio

homing. Survival training goes into strafing, life saving, jumping into water, clothing use, underwater swimming, parachute familiarization, life jackets, shoulder harness and safety belts, crash landings, bailing out, and hand-to-hand.

Primary training is divided into two parts—ground and flight. In the aerial phase, he flies solo and under dual controls, does precision maneuvers, aerobatics, night flying and cross country.

Naval and Marine officers enter the flight training program at the primary phase, as do British Fleet Air Arm trainees.

In August there were 11 primary flight schools, located at Bunker Hill, Glenview, Memphis, Norman, Ottumwa, Dallas, Grosse Isle, Livermore, Minneapolis, St. Louis and Olathe. As the aviation training program slackens off it is expected only the first five will give primary work by the year's end. The other stations will be converted to use by NATS, ferry service squadrons, fleet squadron formation, and for storage of any surplus aeronautical material and planes.



Recognition of enemy and friendly planes is stressed all through pilot training. Long hours of primary training are spent on it



Flight plotting problems and radio homing are taught cadets in primary navigation classes. Plotting boards get considerable use



INTERMEDIATE FLIGHT STUDENTS FLY SOME OPERATIONAL-TYPE PLANES SUCH AS OS2U'S OR PBY'S, TRAINING FOR BOTH CENTERS AT PENSACOLA



INTERMEDIATE TRAINING EXPANDS TO 20 WEEKS

WHEN THE aviation cadet finishes primary training he knows how to fly. Entering the intermediate phase, at Pensacola or Corpus Christi, he is taught how to apply his flying to combat for the next 20 weeks. Under the earlier program, it took him 16 weeks to get his gold wings as a Navy ensign or Marine second lieutenant.

Instrument and night flying, formation flying and air tactics are emphasized at intermediate. He flies heavier planes, graduating from biplanes to SNV, SNJ, PBY, OS2U, SNB.

The first month of intermediate is devoted to basic training, flying SNV or SNJ aircraft in formation or divisional tactics. Following this familiarization, the men get basic instrument training, including link trainer, radio range flying and instrument flights, all important things for a pilot to master.



Old reliable SNJ gets heavy usage at intermediate schools. Students fly them before branching into specialized aircraft types

The third phase of intermediate follows, with the pilot going into a specialized type of aircraft—carrier planes, land based bombers, patrol bombers or observation planes. Generally, he does not fly the service type plane until operational, but in intermediate he begins to get the word on those aircraft and how they are used.

Along with flight training, the intermediate cadet also gets intensive ground training. Thrown in with it is a background of good things for pilots to know—how to inflate and use life rafts, dyes, rescue mirrors, how to get out of cockpits underwater and ditch his plane, use of survival equipment and how to live in jungle areas. More and more attention is being paid in naval aviation to survival. Many officers to teach such material are given background training at Pensacola Naval Air Station and go out to other schools.

HE ALSO may get his first chance with real operational training in OS2U's if he is assigned to an observation or cruiser scout squadron. This vo/vcs program formerly was at Jacksonville, but was recently shifted to Pensacola.



Flying by instruments, so important in combat theaters, is in intermediate curriculum. Navigator uses his drift sight here



OPERATIONAL TEAMS UP PILOT AND AIRCREWMEN

MANY AVIATION cadets will have fallen by the wayside before they reach the final phase of naval aviation training—operational which is given at Jacksonville and elsewhere. Here the pilot flies combat planes and gets further intensive training in the use of the airplane as a military weapon. Working with him, if he is in a multi-place aircraft, are the aircrewmembers who will accompany him to the Fleet and combat.

One of the newer developments in this phase is formation of combat teams. These consist usually of one experienced pilot with actual battle experience with two student pilots as his wingmen. This plan acts as a refresher for the man from the Fleet and gives new men the benefit of his combat knowledge.

Operational training runs from eight to 12 weeks and in it experienced pilots with many weeks of battle experience in the Pacific and Atlantic theaters are the teachers. In pre-war days, the pilot joined the Fleet after intermediate and got his final polishing with his squadron.

Men in vb squadrons fly PV, SNB or PBO's at Jacksonville, receiving training in solo, basic instrument, night flying, navigation over water, masthead bombing, cross-country navigation, radio beams, and torpedo runs.

The vsb pilot flies SBD's or SB2C's, learning instrument flying, tactics, navigation, night flying, field carrier landings, combat tactics and dive, glide and anti-submarine bombing, fixed and free gunnery.

Fighter pilots fly *Wildcats* or *Hellcats*, or if they are Marines, *Corsairs*. Their operational training includes formation flying, navigation, gunnery and combat tactics, night and instrument flying, field carrier landings and small field procedure. They get plenty of aerobatics thrown in to familiarize them with the way their planes handle under all conditions. In battle, they have to fly instinctively so their minds can be free for battle tactics.

Torpedo bomber pilots, as do the others, spend much time familiarizing themselves with their plane. They fly formations, learn how to navigate day and night or on instruments. Gunnery and torpedo drops occupy much of their time. Field carrier landings teach them how to bring their planes down on a carrier deck, no mean job for a pilot.

MEN IN VPB squadrons learn taxiing, landings and take-offs, anti-submarine strafing, torpedo runs, free gunnery, radio beam and instrument work, night landings and navigation and take hops to outlying bases for practice in long overwater hops.

As an example of the thorough training fighter pilots get in operational tactics, the course of study includes interception of high altitude horizontal bombers with or without enemy VF escorts, dive bomber attacks with or without escort, torpedo attacks under similar circumstances, or any combination of plane types. Pilots learn how to escort bombers, dive bombers or TBF's, or any combination of these.

With the increased emphasis on heavier planes such as the PB4Y and PV-2, naval aviation training schools will step up their work of welding pilots and aircrewmembers together into a fighting team. New, revised models of both of those plane types are being readied for combat use and training of men to handle them is being stepped up. As other new types of fighter and scout bomber planes come off the assembly lines, the Navy will revise its operational training to prepare men to fly them in Fleet missions against the enemy.



Field carrier landings at some outlying field give operational flight students training in bringing plane down on limited space



Torpedo drops are practiced by TBF pilots in operational squadron over the sea. Aircrewmembers join pilot in this training phase



Student pilots, navigators and bombers get word before starting off in SNB for practice flights at operational training base

UNITED STATES TRAINS PILOTS FOR MANY ALLIED NATIONS

BRITISH, FRENCH, LATIN AMERICANS RECEIVE TRAINING AT NAVY BASES

AVIATION cadets of 10 countries fighting under the Allied nations banner are trained as pilots at naval air stations. The men receive the same thorough ground and aerial training as any cadet of the United States, so that when they graduate they can fly American plane types.

Largest patron of the cooperative training policy is Great Britain. When its own training facilities were strained during earlier days of the war, it sent its Royal Air Force and Fleet Air Arm men to this country to learn how to fly the hundreds of *Wildcats*, *Hellcats*, *Corsairs* and other planes which were being rushed overseas to stop the Germans.

Other nations whose aviation cadets go through U.S. pilot training are France, Brazil, Chile, Colombia, Cuba, Ecuador, Mexico, Peru and Uruguay.

British Fleet Air Arm fliers enter the training program in the primary phase, taking their instruction at NAS Bunker Hill. Upon graduation there they get their intermediate work at Pensacola, then go to Fort Lauderdale or Jacksonville, depending on whether they are to fly TBF's or fighter-type aircraft in operational training.

The RAF cadet-training program is being terminated, after many hundreds have been taught to fly patrol types at Pensacola, following primary training at St. Louis. P-boat pilots with the RAF got their operational work in England and finally wound up under the Coastal Command.

Fleet Air Arm continues to send its men over for training. Both the FAA and RAF men in the past attended the same basic and instrument flight classes at Pensacola. Since FAA cadets fly fighter and torpedo planes in action, they branch into these types after completing basic and instrument work.

Because training methods differ in the United States and

the United Kingdom, many instructors at Pensacola were summoned from England, Canada, Australia and New Zealand to augment instructors regularly attached to Pensacola.

Although nomenclature is somewhat of a problem in the case of English cadets, it is still more so when it comes to training French students. In as many cases as possible, Frenchmen who already understood English were selected for training in this country.

Training of French started in September, 1942, and since then about fifty or sixty have received their American wings. One squadron of American-trained pilots is operating in North Africa. Men who compose the French classes come from various parts of the French empire and its colonies, some from South America, United States or Africa. Some escaped from German-controlled France and others come from newly liberated areas. Some are experienced pilots being given refresher work preparatory to going into action.

FRENCH STUDENTS start in the pre-flight phase, at Chapel Hill, learning English there along with their aviation. Primary training is given them at NAS Memphis. At Pensacola they learn to fly PBY's and CV type planes and get operational training at Jacksonville or its subsidiary activities.

Latin-American students are handled at Corpus Christi. Each of the nine nations is invited to send a quota of cadets to this country for training in American aviation methods. They get 10 months of this before returning to their home countries. Spanish is spoken mainly in the courses, although many students know English.

First two weeks of their training consists of indoctrination and early ground school, followed by flying in the primary squadron organized for them. Ground training runs along with flight work the first four months, with such subjects as communications, gunnery, recognition, navigation, engines, aerology and aerodynamics being given them.

The students are assigned to various squadron types, carrier, scouting and observation, and multi-engine bombers.



Language problems offer complications as French students go into complexities of navigation. U.S. training many pilots for France



Hundreds of RAF and British Fleet Air Arm pilots have received training at Navy fields. RAF program terminated but FAA goes on



Navy pilot training program is revised downward as squadrons in combat pile up fine records



PONTOON SEAPLANE SLIP

PAN AMERICAN AIRWAYS MEN MANEUVER NATS PB2Y-3R INTO SEAPLANE SERVICING SLIP ASSEMBLED FROM STANDARD NAVY PONTOONS AND FITTINGS

BuDocks recently supervised the construction of two pontoon seaplane servicing slips at Bowery Bay, LaGuardia Field for the use of Pan American Airways operating Navy seaplanes under NATS contract.

The U-shaped slips were assembled from standard Navy lightering gear. The fingers of the slip are formed of two sets of two strings, 15 pontoons in length, fastened together by two strings

of three pontoons which form the head of the slip. Owing to limited space in the Bowery Bay anchorage, the slips were made small. Three extra pontoons added outboard of each finger make the outboard engines on PB2Y-3Rs accessible to mechanics. Although deck space is at a minimum, the slips have proved useful for loading, unloading, fueling and servicing the big aircraft.

BuDocks' standard design for sea-

plane slips (illustrated in BuDocks pontoon gear manual, March 1944), of which these slips are a modification, calls for fingers formed of two sets of three strings, 18 pontoons in length, fastened together by three strings of six pontoons which form the head of the slip. This design provides greatly increased deck space. BuDocks is ready to provide the materials for assembling standard slips at advanced bases.



U-Shaped Slip provides convenient means of servicing big NATS flying boats. Deck house encloses small Diesel-powered generator



Mail Sacks are piled on deck as big transport is unloaded. Engines also are accessible from the deck of pontoon seaplane slip

TECHNICALLY SPEAKING

Compass Is Now Available Pocket Size Aid Used as Standby

A new pocket compass is now available to the service. It is intended for use as a standby for the remote indicating compass and for use in multiplace life rafts. Insofar as standby use is concerned, the compass will be an allowance list item, and may be requisitioned through regular channels under stock No. R88-C-786.

For life raft use, the compass will be included in the equipment container in Mark 2, Mark 4 and Mark 7 rafts in



POCKET COMPASS IS AVAILABLE FOR SERVICE

new procurement. The present match box compass is, therefore, superseded for new production by the pocket compass. Mandatory retroactive replacement of compasses is not intended.

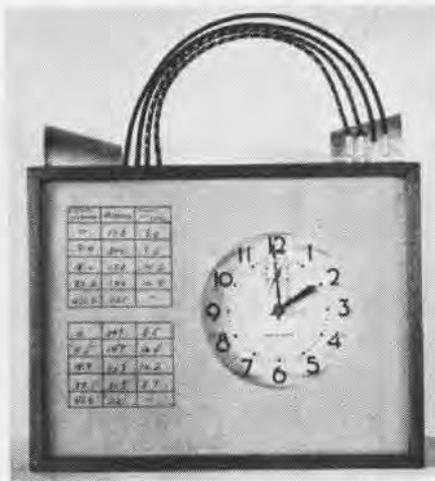
Technically, the new compass is an electro-magnetically damped card type compass in a water-tight transparent plastic case. It may be read from either top or side; 30° graduations, cardinal headings on the edge of the card and an arrow at North on the top of the card are finished in radioactive material. The case has a bead on the top edge with two notches, one at each end of the lubbers line, for sighting. Clips on the base will take a lanyard or strap. The compasses are about 1 1/4 inch diameter by 1-1/32 inch high.

In operation and accuracy, the compass is approximately equivalent to a Mark 8 compass, stock No. R88-C-800, or a B-16 compass, stock No. R-88-C-783, it has no compensator, and must be held away from magnetic materials.

Surplus Light Is Limited An Escort Plan Timer Is Night Aid

VP-205—An escort plan timer for night escort patrols of vp type aircraft has been designed in this command as a means of reducing light in the cockpit and improving accuracy of escort planes. It consists of an alarm clock and four jacks connected to a pair of flashlight batteries and is fitted with two metal brackets which support it on the pilot's yoke.

Jacks are inserted at the time of the turns and when the minute hand



RED LIGHT SERVES AS A REMINDER TO PILOT

reaches them it completes a circuit lighting a small red bulb which illuminates the escort plan. The pilot then is able to read his flight plan which is worked out and filled in on a form affixed to left side of timer. A jack is inserted at the time for each turn shown in the clock setting column and the minute hand is set on 12 at beginning of port or starboard leg.

On flights requiring reports or actions at regular intervals a jack may be inserted when action is required.

(DESIGNED BY LT. (J.G.) W. H. F. HESSER.)

► **BuAER COMMENT**—The escort plan timer described here appears to be a very



useful device. It provides for reduction of extraneous cockpit lights and for a continuous check to the pilot on escort plan navigation. PatRon 205 provides escort.

New Ear Plug Is Stocked Neoprene Device Protects Hearing

Originally developed to protect seamen's ears from severe noise shock of gun blasts and diesel engines, "ear wardens" are now available to aviation activities. Made of neoprene, these ear plugs are designed to prevent partial deafness that sometimes results from long exposure to great noise.



PLUGS MAY BE QUICKLY INSERTED, EXTRACTED

Research on the device was carried on by BuShips and BuMed. Tests of the ear wardens indicate that they actually improve hearing under certain battle conditions. With high level noises pushed into the background, men wearing ear phones could hear signals better wearing "ear wardens" under phones.

Plugs may be quickly inserted by means of a plastic applicator which also serves as a container for the device. This container may be clipped to a pocket like a fountain pen.

Carried on the allowance lists of various aeronautical activities, these "ear wardens" may be ordered through routine channels from the Aviation Supply Office, Philadelphia. These plugs are listed as "protectors, ear" Type V51-R. Stock numbers are: large, 37-P-292-200; medium, 37-P-292-210; small, 37-P-292-220. These plugs are packed one dozen pair to a standard package. Each package contains three large, three small and six medium-sized ear wardens.

CORNER REFLECTOR

THE NAVY's increased emphasis on rescuing its pilots and aircrewmembers shot down in action is illustrated by a new device which will enable search planes to find life rafts at greater distances than heretofore possible. The device, known as a corner reflector, has been placed in large-scale production sufficient to equip all new and old rafts in the service.

Distances at which life rafts at sea can be spotted by eye vary from zero at night up to very few miles in daytime even with the aid of marker dye. It is apparent that a device which makes rafts visible at substantial distances regardless of visibility is welcome news.

The corner reflector operates by increasing the range of radar detection of the raft. There are no tubes, no batteries, and no cables. The device therefore requires no trained maintenance personnel, and operation is only a ques-

Life Rafts to Carry Device to Aid Rescue

tion of erecting the reflector in the raft. Two models are being procured, the MX-137/A and the MX-138/A, for singleplace and multiplace rafts respectively.

As the illustrations show, the two are very similar when open but it was necessary to package them differently because of stowage problems in the rafts. The corner reflector consists of three reflecting planes intersecting at right angles. Such a configuration of planes has the property of reflecting back to the source a large portion of radar energy incident upon it. The reflecting planes are made of a fabric woven of monel metal wire. A loose

mesh is used to reduce windage and monel metal is used because of its corrosion-resisting properties. As a result the reflectors should have a useful life of thirty to sixty days in a raft at sea.

Further data including ranges at which rafts equipped with these reflectors can be detected can be found in the *Naval Aviation Confidential Bulletin* of August 1944 or the *Digest of Radio and Radar News* of 25 August.

FOR a raft equipped with a corner reflector, every radar-equipped aircraft becomes a potential sea-search plane. The new hope which this brings to personnel adrift is accompanied by a new responsibility for radar operators and maintenance personnel, to be alert.

The first reflectors manufactured have already been shipped to fleet activities for familiarization. It is suggested that all flying personnel make it their business to know where the reflectors are stowed in rafts and raft packs and how to erect them. This will take only a few minutes but it may someday prove to be the most valuable act of your life.



CORNER REFLECTORS IMPOSE NEW RESPONSIBILITY ON RADAR OPERATOR ON SEARCHING MISSIONS



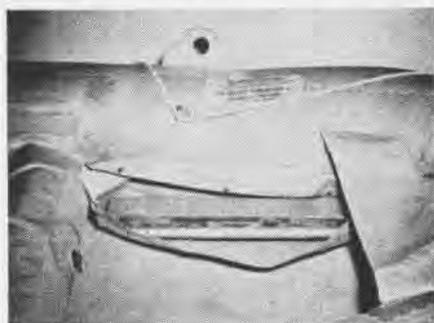
CORNER REFLECTOR INSTALLED ON 1-MAN RAFT



DEVICE IS IN PACK PROVIDED ON SMALL RAFT



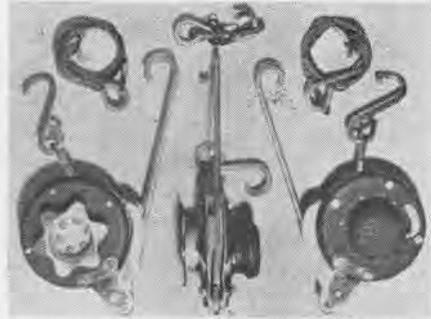
UNFOLDING OF DEVICE IS SIMPLE OPERATION



LARGER RAFT CARRIES REFLECTOR IN POCKET

Mooring Reel Is Supplied New Device Is Developed by BuAer

An improved reel has been developed by BuAer for the proper mooring of airplanes on land or aboard carriers during various adverse weather conditions, as explained by Technical Note 43-43, dated 11 June 1943 and 15 November 1943 issue of NANews.



INTERNAL RATCHET WINDS UP THE REEL CABLE

The reel has a steel constructed case containing an internally wound standard 5/32" airplane cable and three auxiliary cables, 21", 6" and 8' long.

An open hook bar attached to one end of the reel case and open hooks on the cable ends, afford a speedy and secure method of tying down airplanes to apron anchor rings, ground stakes or carrier deck. An internal ratchet having an external hand knob, provides a manual means of winding and unwinding the reel cable. An eccentric slack take-up lever is attached to the reel case for increasing cable tautness. Total weight of the reel is 8 lbs.

To use the reel, the cable end is hooked to the airplane tie-down fitting, reel is unwound and its open hook bar is attached to apron or carrier deck anchor fitting. Cable is made taut by holding the reel in the left hand and turning the hand knob with the right hand. To make the cable absolutely taut the eccentric slack take-up lever is pulled back toward the reel case. Reverse procedure is followed when detaching the reel.

This mooring reel can be obtained by requisition to ASO, NASD, Philadelphia, bearing nomenclature "R89-R-90500, Reel, Aircraft Mooring." To secure airplanes to ground surfaces having no anchor rings, it is necessary to use a "Stake, Mooring, Auger Point, R6-S-4300" in conjunction with reels.



AVIATION ORDNANCE

INQUIRIES SHOULD BE ADDRESSED TO THE CHIEF OF BUREAU OF ORDNANCE

Instruction Card Can Reduce Bomb Duds

On one occasion a U.S. plane on patrol in the Marshall Islands sector dropped four AN-Mk 47 depth bombs on or extremely near a Japanese vessel. All the bombs failed to explode. The bombs had been released at an altitude insufficient to insure the arming of the AN-M103 fuze installed in the nose of the bombs. Again, during the period from 23 November 1943 to 20 December 1943, over 100 unexploded bombs were recovered and immunized on Tarawa Atoll in the Gilbert Islands. Many of these bombs were in an armed and sensitive condition upon recovery, but many had not become armed due to the low altitude from which they were dropped and the consequent insufficient number of turns of the arming vanes.

would tend to show that it is not.

Pilots should request that these "Ordnance Handling Instruction" cards be submitted to them before taking off, and the various activities should check to ascertain that the cards are received with the bombs.

Any suggestions for improving the form of the OHI, or the method of distribution, should be addressed to the Bureau of Ordnance. A sample card is shown below.

Petroleum Products Are Bad for Gun Parts

Information received by BuOrd indicates that many activities use only petroleum distillate products to clean the bore of aircraft machine guns after firing. This cleaning procedure is contrary to all instructions issued on the subject and it is desired to remind the fleet that after firing

<p>RESTRICTED</p> <p>NAVY DEPARTMENT, BUREAU OF ORDNANCE, WASHINGTON, D.C.</p> <p>Approved by the Chief of the Bureau of Ordnance</p> <p>ORDNANCE HANDLING INSTRUCTIONS</p> <p>ARMAMENT AND FUSELAGE—DEPTH BOMBS</p>		<p>1 Page—Page 1</p> <p>Date: 20 Dec 43</p> <p>NAVYHEAD</p> <p>OHT AV 20-43</p>										
<p>BOMB DATA CARD FOR 25-LB.-50-LB. DEPTH BOMBS, AN-MARK 1-2 AND AN-MARK 41 WITH FLAT NOSE ATTACHMENT, OR AN-MARK 41 AND AN-MARK 41.</p>												
<p>1. REFERENCES</p> <p>(a) OHT's A10-43, A14-43, and AV14-43 are hereby incorporated and should be studied.</p> <p>(b) See OCL's VBS, VBSA, VBD, A11-43, and AV14-43 for additional information.</p>												
<p>2. PURPOSE</p> <p>Give to pilot when bomb is on the plane.</p>												
<p>3. INSTALLATION</p> <p>(Indicate by check)</p> <table border="1"> <thead> <tr> <th>Fuze Combination</th> <th>Air Travel to Arm</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> AN-Mk 218 (None Fuzed)</td> <td>2,000-2,300 Feet*</td> </tr> <tr> <td><input type="checkbox"/> AN-M103 (None Fuzed with modified arming vane)</td> <td>1,000-1,300 Feet*</td> </tr> <tr> <td><input type="checkbox"/> AN-Mk 224 (Hydrostatic)</td> <td>Just Arming</td> </tr> <tr> <td><input type="checkbox"/> AN-Mk 231 (Hydrostatic)</td> <td>Just Arming</td> </tr> </tbody> </table> <p>*Without flat nose air travel is 1,500 Feet for Mk 218 and 900 Feet for M103 with unmodified arming vane. When sensitive arming is available, this bomb should be fused with both a nose and hydrostatic fuze.</p>			Fuze Combination	Air Travel to Arm	<input type="checkbox"/> AN-Mk 218 (None Fuzed)	2,000-2,300 Feet*	<input type="checkbox"/> AN-M103 (None Fuzed with modified arming vane)	1,000-1,300 Feet*	<input type="checkbox"/> AN-Mk 224 (Hydrostatic)	Just Arming	<input type="checkbox"/> AN-Mk 231 (Hydrostatic)	Just Arming
Fuze Combination	Air Travel to Arm											
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<input type="checkbox"/> AN-Mk 224 (Hydrostatic)	Just Arming											
<input type="checkbox"/> AN-Mk 231 (Hydrostatic)	Just Arming											
<p>See other side for delays and recommended uses</p>												
<p>Requests for this publication should be addressed to the nearest BuOrd Publications Distribution Center, Control and Supply, Navy Gun Dept., Wash. 25, D. C.; Norfolk, N. Y.; Mare Island, Calif.; Stock, OrdPublication, NGS; Fleet, ComSubPac, Beverly Hills, OrdPublication, care of FPO San Fran.</p> <p>and 16-9710-1</p>												
<p>4. USE AND CARE IN HANDLING</p> <p>Delay and recommended uses. (Indicate delay by check)</p> <p><input type="checkbox"/> Inertialess (Mk 218 or M103 None Fuzed)—Anti-personnel, small high speed incendiary bombs, TD's, moderate to light buildings (1 story), extended aircraft, surface submarines.</p> <p><input type="checkbox"/> 10 sec. (M103 None Fuzed)—Not recommended as item will fall before penetrating air armor or heavy deck plate.</p> <p><input type="checkbox"/> 2' Depth Setting (Hydrostatic)—Setting effort applied any vessel, anti-submarine attack.</p> <p><input type="checkbox"/> 50'-75'-100'-125' Depth Setting.—Attains depth setting for submarine attack.</p> <p>Release above 50' to avoid rebound. Without flat nose attachment release above 100' to avoid rebound. Danger area extends over target at altitude under 300' until water surface.</p> <p>50C AND 50N TYPE JETTERON THIS BOMB BEFORE LANDING IN ROUGH WATER</p>		<p>This bomb is suspended from _____</p> <p>(16-0781-1)</p>										

Earlier similar reports of such a nature were reported and the Bureau of Ordnance attempted to solve the problem by issuing handling instruction cards on the majority of service bombs and fuzes which would be made available to the pilot. These cards were to be inserted in the fuze cavities of bombs and in the fuze containers of certain fuzes by the various ammunition depots. Printed on each card appears the more salient facts concerning the particular piece of ordnance material involved; such as *Air Travel to Arm* and *Delay and Recommended Uses*.

So that the pilot would have this information at hand, instructions to "Give to pilot when bomb is on the plane," and space to indicate the bomb and fuze combinations used, was clearly printed on each card. Whether or not this policy is being carried out, is in question, but the number of reports received by BuOrd

a gun the barrel, face of bolt and parts of the receiver adjacent to the rear of the barrel are fouled with primer salts residue.

These salts are water soluble only and are not removed by cleaning with petroleum distillates. If not properly removed excessive corrosion results which will shorten gun life and may cause stoppages.

The correct cleaning method requires the use of a water solution to remove the primer salts and a hot, soapy water solution is probably best. However, it is recognized that hot water is not always available especially under combat conditions. BuOrd recommends the use of an especially prepared solvent, "Cleaner, rifle bore, RIXS 205," which is available at supply points in quart containers under stock number R-51-S-4796. All activities maintaining aircraft machine guns are urged to keep a sufficient supply of this cleaner on hand to take care of all needs.

Can Secure Landing Gear System Is Used When Gear Fails

VT-60—This squadron has found that landing gear of TBF and TBM can be locked fully down even with complete failure of hydraulic system.

Release landing gear from locked up position either by moving control handle to "down" or pulling emergency release handle fully out and locking it by turning 4 degrees clockwise. By skidding plane first to one side and then the other large fairing on landing gear will act as an air foil and force each wheel fully down in turn.

This procedure has been used with speed up to 150 knots, failure of hydraulic system being simulated by lowering landing gear with emergency release handle, leaving hydraulic control lever in "up" position. It is not recommended that this experimental procedure be used extensively because of possible stresses on the hydraulic system.

It was noted that the emergency release on most airplanes received by this squadron had to be cleaned of rust before they could be operated without difficulty.

► **BuAER COMMENT**—This is a restatement of the procedure recommended on page 10 of the *Avenger Pilot's Handbook*. It is a healthy practice for pilots to familiarize themselves with all tricks that may be used by Navy pilots in emergencies.



SAFETY TOOL DESIGNED TO PERFORATE FLARES

Tool To Perforate Flares

Accident Prevention Is Purpose

Night drift signals AN-Mark 4 and AN-Mark 5 model 1 frequently have failed to function when dropped from airships at low altitudes. To insure functioning of these signals, BuOrd has approved the practice of perforating with a sharp instrument the paraffin sealing disc in the nose of signals.

Fleet Airships, Atlantic has developed a simple and light weight tool to be used in cutting out sealing disc when either of the two types of signals is to be dropped from an altitude of less than 250 ft. This tool is designed to prevent serious accidents from occurring when personnel, attempting to perforate the sealing disc, inadvertently force firing pin back against primer and ignite flare.

Instructions issued to blimp squad-

rons direct that any signals paraffin sealing discs perforated shall be used or loaded in release chute within 10 seconds and jettisoned over water before landing. No alteration is to be made to signals dropped from above 250 ft.

Device Aids Rocket Pilots Trains Them to Find Diving Angle

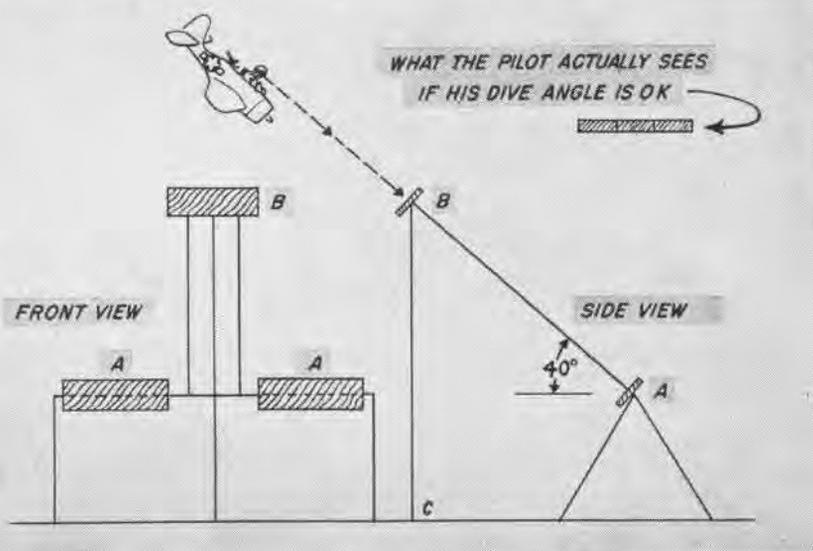
A dive angle estimation trainer, similar to the one shown in the accompanying sketch, is currently in use by the RAF in England to train pilots in estimating their angle of glide during aircraft forward firing rocket training. The chief advantage in its use lies in the fact that essential training can be given without use of a ground observation party, or radio equipment for ground to air communication.

This device requires use of three planks, each about one to two feet wide by 10' to 15' long. They should be painted white or yellow to be visible easily by the pilot against the background in use. By means of an adjustable bar (BC in the side view) the arm AB which connects the planks AA with the plank B can be elevated or lowered at will, to set the proper angle upon this training device.

In the event the 40° angle is selected as shown, this device is adjusted so the bar AB aligns planks AA and B so that when the pilot actually is diving at a 40° angle toward the device, he will see all three planks in a straight line. If the dive angle is steeper than 40°, the center plank will be above the two end planks. Accompanying drawings are schematic diagrams.

If it is desired to include ranging training, at the same time dive angle training is done, it is recommended that the pilot use the rings on the fixed gun sight to determine the range to the target. An alternate method of determining range is to mark a circle on the ground about this device, the diameter of the circle to be such that at any given range the circle will coincide with a selected circle in the sight.

Use of this device on a smaller scale aboard a carrier is believed to be possible. The planks AA may be fixed on the deck or side of the carrier. Use of properly aligned lights to replace the planks is proposed for night as well as day glide angle estimation training.



WOODEN 'TARGET', BUILT BY RAF, HELPS DIVING PILOTS TO ESTIMATE ROCKET-FIRING ANGLE

NIGHT SKY IS SHOWN

Star gazing as a means of learning navigation is made possible by the Star Recognition Trainer, Device 1-BV-1 developed by BuAer's Special Devices Division. It consists of a near hemispherical screen, spherical star pro-

jector and flashlight, which is held by instructor. The screen is suspended from above with projector under its center at about eye level. The projector is a 16" celestial globe. It shows important stars through the fifth magnitude. Light at center of globe shines through holes onto screen. The screen is 10' in diameter covering 140° of the

hemisphere and provides space for all stars from 20° above horizon to the observer's zenith. This device can be had by request to Chief, BuAer. It is portable and comes with 25' of cord connecting it to an ordinary 110 volt circuit. Transformer for lights in globe and flashlight pointer included.



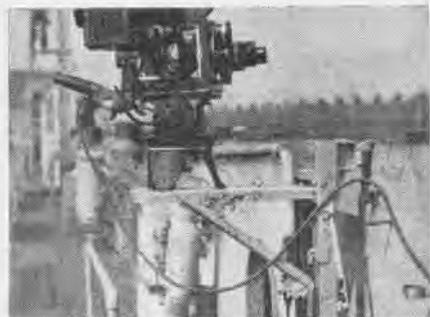
PHOTOGRAPHY

Kodacolor Filter Mount Work Begun

BuAer is working on the problem of suitable mounts for Aero Kodacolor Filters. Definite information on this matter will be published at a later date.

Carrier Deck Camera Mount Is Ordered

Procurement is being initiated for deck-edge motion picture camera mounts for the large carriers. The principal features of this mount are ease of installation and removal, and provision for emergency re-



MOVIE CAMERA IS MOUNTED ALONG SHIP'S RAIL

lease of the platform to permit the camera to be dropped below the deck edge, thereby avoiding damage to the camera and possibly additional damage to the aircraft in cases where planes swerve into or over the camera position. Two mounts will be supplied all cv's.

Spares for K-20 Camera by Number

All parts on the Fairchild and the Folmer Graflex K-20 cameras are not interchangeable. Therefore, spare parts for those cameras should be ordered by the manufacturer's number for the cameras.

Bracket Holds Long-Range Still Camera

Pictures of distant sea or aerial engagements are recorded much more successfully when long focal length lenses are available to naval photographers. Due to the telescopic effect, much greater detail is secured on the negatives, but holding the camera during the exposure sometimes



BRACKET HELPS SECURE CAMERA FOR SHIP USE

presents a problem. The accompanying photograph shows how the carrier *San Jacinto* solved the problem with a bracket welded to the rail near a gun position. Pictured is the F-56, with a 40" lens.

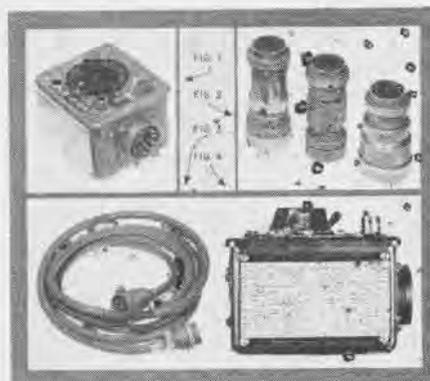
Set Will Test 15 Circuits No Expert Required for New Unit

NAS SAN DIEGO—A complete electrical circuit checking unit for planes has been devised by an NAS snapper electrician under the beneficial suggestion program. It can be operated by comparatively unskilled personnel, and it has saved this station 12 man-hours a week.

The compact unit was designed to make positive check of all electrical circuits on planes prior to installation of wings and engine and will check as many as 15 different circuits. It includes all necessary equipment except extension cord.

Top view of selector switch and end view of cannon plug are shown in Fig. 1 of accompanying photograph, while adapters are shown in Fig. 2. Extension cord, which has one 15-point cannon plug permanently installed on it, is shown in Fig. 3. Selection chart mounted on test box is seen in Fig. 4.

In use, permanent end of extension cord is plugged into test set and the right adapter to fit the airplane is attached to the other end of extension cord to wing or firewall connectors. A



WORKER DESIGNS DEVICE TO CHECK CIRCUITS

light bulb first is installed. When battery current is switched on, and the selector switch turned to various points on the chart, the bulb will indicate that the current is functioning.

[DESIGNED BY R. M. HUMMEL]

Hydraulic Set Is Compact Brake And Wing Systems Tested

VF-17—A portable hydraulic test set which has been designed and built by squadron personnel, has proved of great value in hydraulic maintenance.

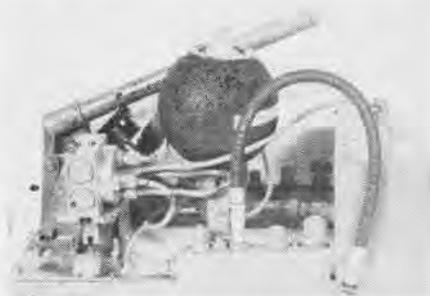
This unit is mounted on a rectangular frame made of 3/4" angle iron. It is light, compact and easily carried or stowed away. The reservoir has a capacity of 3/4 gals. Salvaged thermal relief manifold blocks are secured on each side of the frame, one having four dif-

ferent sized AC fittings and the other, four different sized AN fittings. Fittings not in use are plugged with cap nuts.

By use of a selector valve, fluid pressure can be directed to either block or returned to the reservoir. Pressure accumulator and pressure gauge are connected to the line with r fittings.

This device is capable of pumping 2000 lbs. pressure and is especially valuable for bleeding brakes, testing various hydraulic equipment and folding wings on flight deck in case of hydraulic failure.

Entire unit including fluid weighs only 23 lbs. The tank holds 3/4 gals. but



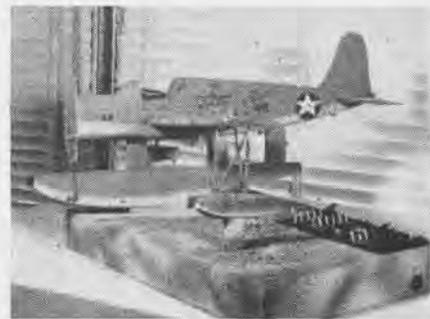
TESTING UNIT PRODUCES A TON OF PRESSURE

would preferably be enlarged to about 1 1/2 gals. The set is 18" long, 8" wide and 12" high. Size of fittings used depends on the particular hydraulic system for which the device will be used. This model, used for F6F systems, includes sizes: 3/8", 5/16", 3/4" and 1/2".

[DESIGNED BY DEAN A. LEWALLEN, ACM(T)]

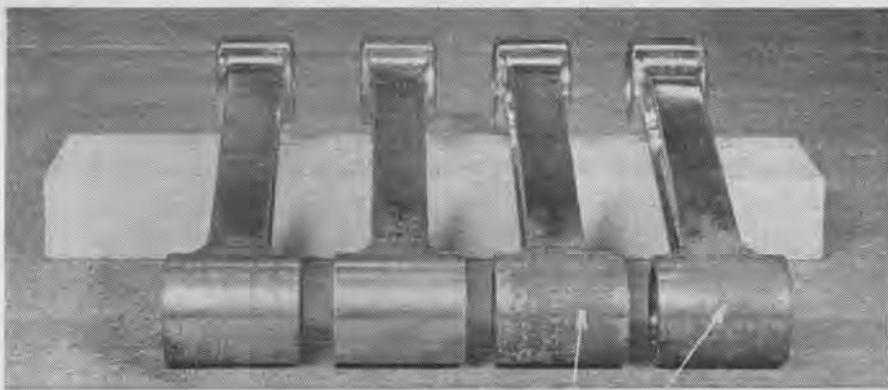
Trainer For Night Flying Lights Simulate Those of an OS2U

NATB, PENSACOLA—A plane lighting and signal demonstrator which is used effectively in conjunction with lectures on plane lights and signals has been developed by NavAirTraCen, Pensacola. The device consists of an OS2U plane model mounted on a base housing two six-volt batteries which provide current for lights mounted on the model. These



ACTUAL OS2U NAVIGATION LIGHTS ARE COPIED simulate actual OS2U navigation lights.

This device may be made at other training centers with 1:72 models and other materials locally available or may be manufactured from BuAer funds.



AIRCRAFT ENGINE PARTS SO HIGHLY STRESSED SMALL CORROSION PITS RENDERED RODS USELESS

WATCH ENGINE PRESERVATION!

MAJOR overhaul activities continue to receive many engines with little or no preservation. Insufficient preservation results in big increases in time and labor required for overhaul. Part replacements usually are far in excess of those normally required for reconditioning. Numerous RUDM's evidence this. Frequently engines are idle for weeks or months before or during shipment. Make it a rule always to apply preservation unless transfer of engine to a major overhaul activity within 24 hours is a certainty.

Complete and correct procedure for engine preservation is contained in General Engine Bulletin No. 38. All operating personnel should familiarize themselves with this. It is realized some advanced bases shipping engines may be without preservation materials that are called for.

If an activity has no supply of AN-VV-576 for interior or RM-61-C for exterior, it can preserve with used engine oil. Seal exhaust ports with steel plates or wooden plugs, cap carburetor flange and any accessory openings. Then fill engine including upper cylinder bars

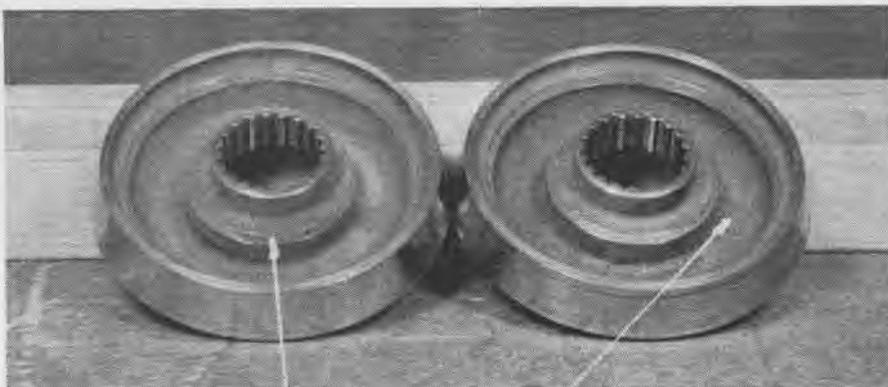
rels (through spark plug holes) with used oil, coating exterior generously. While not ideal preservation, it's a lot better than nothing, and may mean that some activity gets a badly needed engine at a later date. After preservation, paint information on nose section, giving



THIS CRANKSHAFT CORRODED IN FOUR MONTHS

type of preservation used and date.

Responsibility for preserving or re-preservation engines is shared by any activity handling the engine. An engine awaiting overhaul should be preserved the same as an engine ready for issue. Intervals between actual shipment overhaul and reshipment may be months.



DAMAGE DONE TO CONES WHEN MOTOR WAS NOT PROPERLY PRESERVED DURING LONG IDLENESS

POWER PLANTS

Trouble Is Not Always Carburetor Fault

The following is quoted from a manufacturer's field service representative report:

"At one base, I was informed they had had a good deal of carburetor trouble with practically all planes of this model—engines were rough at any altitude in automatic rich or automatic lean regardless of RPM or manifold pressure and when mixture control was put in full rich everything cleared up. So they had richened up the carburetor settings and also set the automatic mixture control richer.

"With all planes apparently operating ok at this time and no pilot complaints, they were satisfied to leave them as they were. I finally persuaded them to take one of the airplanes they had experienced the most trouble with and set it according to proper specs. The plane then was test flown.

"Contact from control tower was made immediately after take-off and every 2,000' thereon. During the climb, all checks were favorable to the highest degree. The plane was flown for one hour and tested up to 29,000'. Upon completion of the test, pilot reported this as one of the best performing ships he ever had flown.

"This performance convinced everyone concerned that carburetor setting was not the trouble they had experienced. Before leaving, I arrived at an understanding that they would reset all carburetors and mixture controls according to proper specs."

COMMENT—A carburetor difficulty is not easy to diagnose. A large number of troubles actually caused by engine, propeller, or accessories can be, and often are, attributed to the carburetor.

True, some may be due to it, but before destroying the results of a helluva lot of engineering research, flight tests, and experience by taking a "whack" at the carburetor setting, be certain that you're dead right about the cause of the trouble! The minor "improvements" which you might feel like tossing in to "touch up" the setting sometimes have a way of boomeranging.

Don't get the idea that BuAer is not receptive to possible improvements. If you really feel you've got something, pass it back to the Bureau and we'll put it through the test mill.

Carbon Tetrachloride Causes Corrosion

It has been found that one of the main causes of excessive corrosion of electric governor heads is the use of carbon tetrachloride as a cleaning agent during overhaul of these units. The use of carbon tetrachloride will result in the formation of corrosion products and its use should therefore be avoided.

After cleaning, the parts should not be handled unnecessarily. Lubricants should be applied to the electric head with the use of spatula rather than by using the hands.

NEW FILMS

Fighting weather. It took a war to do it, but the much-maligned weather man finally has come into his own, as evidenced by the eight motion pictures produced for the Navy in color by Walt Disney's best technicians.

A flying acquaintance with aerology, so vital to the fellows up there beating paths in the wind, is made less difficult by these films:

- MN-119a *Aerology—Ice Formation on Aircraft; Part I, How and Where Ice Forms; Part II, Review*
- MN-119b *Aerology—Fog*
- MN-119c *Aerology—Thunderstorms*
- MN-119d *Aerology—Air Masses and Fronts*
- MN-119e *Aerology—Cold Front*
- MN-119f *Aerology—Warm Front*
- MN-119g *Aerology—Occluded Fronts*
- MN-119h *Aerology—Flying the Weather Map*

Since these films are in technicolor, the number of prints available is limited. But prints have been shipped to Central Aviation Film Libraries and Sub-Libraries so that all activities in their area can have a crack at them.

Design for living. As the Philippines loom through the sights of high Pacific strategy these days, the need for intimate knowledge of these key islands by those likely to be forced down there is urgent. A timely sound slide film (with accompanying record) in color packs a great deal of helpful information into 19 minutes of film:

- SN-1538t *Theaters of War—Pacific Area—Philippine Islands*

Dividing the Philippines into three major areas (Luzon, Visayan and Mindanao), the film talks about weather, terrain, location of cities and islands, edible food (plants, fish, animals), the water problem, sleeping quarters, protection against mosquitoes and other pests. Chief people of the Philippines (Filipinos, Pagans, Moros, Negritos, Ilicanos) are studied from the viewpoint of how to deal with them.

Combat fatigue. Causes, symptoms and treatment of the war malady, combat fatigue, are realistically dramatized in:

- MN-3428a and b *Introduction to Combat Fatigue*—30 min.

Actually, these two pictures are identical in content with the exception that the opening and end titles are cut from the first film, MN-3428a, which is designed for use only in those hospitals having combat fatigue patients. MN-3428b is for medical officers and hospital personnel.

The story follows a Marine through intense convoy, landing and holding battle experiences. Jumpy nerves, depression, nightmares, irritability, sleeplessness, and similar symptoms show the increasing strain of combat, until he reaches the breaking point with the death of his buddy. Back in the States, expert treatment dispels his mental obsession.

Malaria buzz-bombs. Like the late flying robots, malaria-carrying Anopheles mosquitoes

strike blindly but often, and the attendant damage is heavy and widespread. Defense measures, however, are far advanced and the responsibility for reducing malaria casualties now rests largely with the individual. Much that a man can do to save his own hide from the attacks of the lethal carriers is the main theme of:

- MA-4176 *Malaria Discipline*—27 min.

Some of the questions answered in this film: How are mosquitoes and their breeding places controlled? Where does malaria occur? What are the habits (all bad) of Anopheles and how does she transmit the malaria parasite? The high no-ceiling price of carelessness is dramatized with stories taken from life (and death).

Bubble sighting. Two new films on the Pioneer Bubble Sextant will be of interest to Navigators and Aviation students:

- MN-83ab *Navigation (Air) The Pioneer Bubble Sextant—Mark 5—Part I*
- MN-83ac *Navigation (Air) The Pioneer Bubble Sextant—Mark 5—Part II—Averaging Device, Adjustment and Practical Use.*

The first film gives a general description of the instrument, demonstrating use without the averaging device.

The second picture shows how to use the sextant with the averaging device, explaining the necessary checks and adjustments.

Theory of relativity. Two new films in the Navigational series set up relativity problems and knock them down for discussion in:

- MN-83y *Air Navigation—Relative Movement—Part I*
- MN-83z *Air Navigation—Relative Movement—Part II Out and In Search—Relative Wind.*

MN-83y illustrates the basic principles of relative movement and interception between planes and ships. A number of problems are posed and solved.

In MN-83z, animation and model photography are used to explain relative movement, computing time, speed, course when leaving and returning to a carrier, searching on a relative bearing to a carrier and relative wind.

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

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

Shoulder Straps Can't Slip Connecting Links Now Available

As indicated in Technical Note 34-44, connecting links designed to prevent shoulder straps from slipping off the wearer's shoulders have been obtained and are now ready for distribution. Activities requiring these connecting straps may order from major supply points.

Connectors are to be snapped on to shoulder straps as illustrated in photo-



REMOVAL OF LINKS IS USUALLY UNNECESSARY

graph, or in any other convenient manner, wherever no other means, such as a retaining loop on the back of seat, for holding straps together is provided in the installation. Ordinarily, it will not be necessary to remove them after they are snapped on; however, this may be easily done by pulling snaps apart from the outboard side (as indicated by arrows stamped on the snaps).

New shoulder straps now being procured by BuAer have a permanent connecting link built into the strap. It will only be necessary to use the detachable link, described herein, on straps previously issued.

Sextant Holder Developed Dome Suspension Arm Is Replaced

VP-45—This squadron, operating airplanes which are not equipped with the standard astro dome, faced the problem of steadying the AN (Mark 5) sextant during the taking of sights when the suspension arm could not be used.

A device has been developed which is now in constant use in the squadron. It consists of a strap around the neck, suspending a cup adapter on the chest or upper abdomen. A pole approximately a foot long is placed in the cup. A wooden template is cut to conform to the contour of the bottom of the sextant and the circumference of the pole. It is placed on the pole with a small brad to keep it from sliding down. The sextant is then placed on top of the template so the averager winding key can rotate.

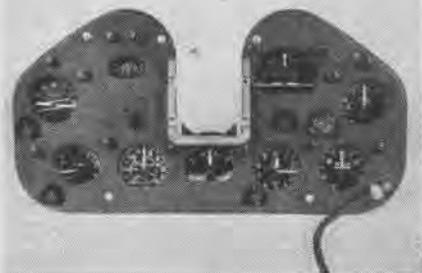
► **BuAER COMMENT**—It is believed that sufficient steadiness may be achieved if the sextant is held as described in chapter 17 of the *Handbook of Aircraft Instruments*.

LATEST BULLETINS ENGINE, AUXILIARY POWER PLANT, ACCESSORY, PROPELLER 21 September 1944

ENGINE	BULLETIN	DATE	SUBJECT	EXPLANATION
Pratt & Whitney				
R-985	184	8-29-44	<i>Push Rod Cover Packing</i>	Use of new packing
R-1340	197	Supp. #1 9-8-44	<i>Rocker Arm Shafts on the P&W R-985 and R-1340</i>	Standardization of rocker arm shafts
R-1340	204	5-30-44	<i>Impeller Shaft Rear Spacer to Cover Clearance</i>	New values for subject clearance
R-1340	205	Being issued	<i>Stromberg N-A-Y8E1 Setting Change</i>	Improved performance and fuel economy
R-1340	206	8-29-44	<i>Push Rod Cover Packing</i>	Use of new packing
R-1830	372	8-10-44	<i>Auxiliary Drive Housing</i>	Improved lubrication
R-1830	373	9-6-44	<i>Improved Type of Main Oil Sump Vent Pipe</i>	Information on new type pipe
R-1830	374	8-28-44	<i>Rocker Box Sump Scavenge Pipe</i>	Instructions on new parts
R-1830	375	8-29-44	<i>Push Rod Cover Packing</i>	Use for new packing
R-2000	80	8-10-44	<i>Auxiliary Drive Housing</i>	Improved lubrication
R-2000	82	Being issued	<i>Supercharger Fuel Drain Valves</i>	New Type valves
R-2000	83	8-29-44	<i>Push Rod Covering</i>	Use of new packing
R-2000	84	8-22-44	<i>Redesigned Valve Springs, Exhaust Valves and Front and Rear Cams</i>	Design change and use limitations
R-2000	85	8-28-44	<i>Rocker Box Sump Scavenge Pipe</i>	Instructions on new parts
R-2800	151	8-19-44	<i>Checking Crankshaft Runout</i>	Change in method of checking
R-2800	152	8-30-44	<i>One Piece Push Rod Covers</i>	Instructions on subject parts
R-2800	153	Being issued	<i>Stromberg Model PT-15 Carburetor Setting Change</i>	Improved operation
R-2800	154	9-2-44	<i>New Inlet Valve Springs</i>	Change in inlet valve springs
Wright				
R-760	None			
R-975	23	6-8-44	<i>Mixture Control Needle Seat Gasket Material Change</i>	Reduce possibility of engine failure
R-975	24	9-7-44	<i>Installation of Oil Tank Vent Sump Can Assemblies on Engines Prepared for Storage</i>	Drainage can of sufficient size
R-1820	366	8-14-44	<i>Defective SKF Bearings, Wright Engine Parts</i>	Segregation and return of defective main bearings
R-1820	367	8-11-44	<i>Water Injection Carburetor Adapter Discharge Valve Tube Assembly—Replacement of Instructions for Grit-Blasting Counterweight Pins</i>	Eliminate interference between engine mount and water injection discharge valve connecting "T"
R-1820	368	Being issued	<i>Ignition Cable Installation—Failure of</i>	Increase service life for counterweight pins
R-1820	369	9-1-44	<i>Installation of Oil Tank Vent Sump Can Assemblies on Engines Prepared for Storage</i>	Special inspection and rework of ignition harness
R-1820	370	9-7-44	<i>Replacement of Washer WAC Part No. 27D118 with Washer WAC Part No. 27D147 between Supercharger Clutch Oil Control Springs</i>	Drainage can of sufficient size
R-1820	371	9-5-44	<i>Rework of Rear Crankcheeks WAC Part No. 88916 to WAC Part No. 113597 to Provide Oil Passages to Counterweight Bushings</i>	Improve clutch operation
R-1820	372	Being issued	<i>Defective SKF Bearings—Wright Engine Parts</i>	Provide pressure oil passages to eliminate counterweight pin scuffing
R-2600	144	8-14-44	<i>Cylinder Machining and Studding Assemblies with Buttress Thread Exhaust Valve Seats—Replacement</i>	Segregation and return of defective main bearings
R-2600	145	8-12-44	<i>Flange Type Intake Pipe Hose Connections</i>	Prevent exhaust valve seat failures
R-2600	146	9-7-44	<i>Installation of Oil Tank Vent Sump Can Assemblies on Engines Prepared for Storage</i>	New assembly for replacing damaged or leaking intake pipe connections of rear row cylinder
R-2600	147	9-7-44	<i>Replacement of Push Rod Housing Hose Clamps WAC Part Nos. 4019D and 6047D</i>	Provide a drainage can of sufficient size
R-3350	21	1-4-44	<i>Loose Fit Sinter Master Rod Bearings</i>	Prevent oil leakage
R-3350	24	Revision #1	<i>Grooves—Piston Ring—Remachining of</i>	Maintenance instructions
R-3350	25	6-15-44	<i>Throttle Valve Clearance and Throttle Shaft End Play in all Stromberg "PR" Type Carburetors</i>	Latest information for reworking piston ring grooves
R-3350	26	7-29-44	<i>Defective SKF Bearings Wright Engine Parts</i>	Prevent possible galling of the throttle bores
R-3350	28	8-14-44		Segregation and return of defective main bearings
Continental				
R-670	None			
Lycoming				
R-680	14		Not assigned	
R-680	15	8-8-44	<i>Ignition Distributor Heads—Ventilation of</i>	Prevent formation of moisture or nitric acid film on dielectric surfaces
Ranger				
R-770	None			
R-440	None			
	41	9-1-44	<i>Stromberg Float Type Carburetor Throttle Valve and Screw—Securing of</i>	Eliminate possibility of dropping into engine
	52	8-18-44	<i>Engine Service Instructions (Operator's Handbooks) Engine Overhaul Manuals—Distribution</i>	Revised procedure for distribution
GENERAL ENGINE BULLETINS				
AUXILIARY POWER PLANT BULLETINS				
	None			
PROPELLER BULLETINS				
	None			
Curtiss				
	None			
Hamilton Standard				
	21	7-12-44	<i>Wooden Blades Installed in Hamilton Standard #D30 Hubs for Use on SNV Aircraft</i>	Instructions on use
	22	8-25-44	<i>Hamilton Standard Service Bulletins</i>	Approval of Hamilton Standard Service Bul. No. 91
GENERAL PROPELLER BULLETINS				
	None			
POWER PLANT ACCESSORIES BULLETINS				
	55-44	8-26-44	<i>Fuel System Access. J-4 (Aero Supply Fuel Selector Valves—Poppet Valve Seal Washers)</i>	Tendency of poppet valve seal washer to shrink when dried out
	56-44	8-26-44	<i>Fuel Pumps, 2-16, (Pesco Fuel Pumps—Bearings)</i>	Standardize size of bearings in Pesco fuel pumps
	57-44	8-26-44	<i>Miscellaneous Accessories J-9 (Parker Appliance Co. Tapered Plug Valves)</i>	Proper lubrication of tapered plug valves
	58-44	9-2-44	<i>Miscellaneous Accessories J-10 (Water Pumps)</i>	Prevent corrosion of water pumps when not in use
	60-44	9-11-44	<i>Fuel System, J-6 (Cork Seated Fuel Valve—Maintenance of)</i>	Information on maintenance of fuel selector valves
	61-44	9-11-44	<i>Fuel Pumps, 2-18 (Thompson Products Co.—Engine Driven—Replacement of Thrust Washer)</i>	New thrust washer provides more positive engagement for locking tang

Red Lighting Is Adopted System Used in Night-fighters

As a result of considerable research BuAer has adopted red lighting for instrument panels and certain other locations in naval aircraft so that night vision of flying personnel may be most efficient. Pilots of night-fighter aircraft must be able to read their instruments



RED LIGHTING COVER OVER INSTRUMENT PANEL

and radar scopes without affecting their ability to discern objects outside the plane.

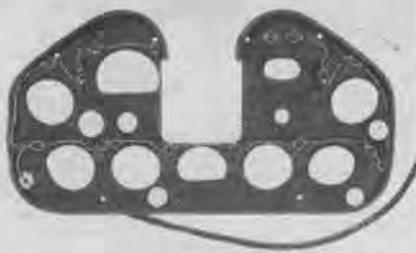
Consequently BuAer has specified red lighting for all night-fighters, both new and those now in the field. Red lighting is also specified for all other types of aircraft on new contracts except those purchased from the Army. These will still have ultra-violet lighting. In addition to instrument panels, all compartments where outside vision is required will be provided with red illumination.

Now equipped with red lighting are F6F-5 and 5(N), F7F-1, 2, FM-2 and TBM-3. New type of lighting will be in the F4U-4 and SB2C-5 when they come off production lines and in the PB4Y-2, PBM-5, PV-2 and PB4Y-2 early next year.

In addition, red-coated lamps have been procured and are available for installation in cockpit lighting fixtures of planes now in the field. A full assortment of red lamps will be found at ASA Oakland, NASD Norfolk, NASD Philadelphia, and NAS Jacksonville. At all locations in the airplane where the ability of crew to see at night is important, these red-coated lamps should be used. Navy Aeronautical Specification M-573a has been prepared covering red-coated lamps which are specified by cone-to-rod ratio. This is a method of measuring a lamp's damage to dark adaptation.

Red filter assemblies have been procured for radar scopes as a result of studies made at NAS Quonset and at NRL. Shade of red selected is of such

density that dark adaptation is maintained with minimum loss of ability to detect faint targets on radar scopes. Requirements for new "red indirect instrument lighting" program are set forth in Navy Aeronautical Specification SR-127a. In this system, instruments are illuminated by small lamps placed between mounting panel and cover panel. Lamp sockets are located on cover panel



INSIDE OF COVER PANEL USED IN RED LIGHTING

and are designed so lamps can be replaced without removing it. Instruments are seen through holes in cover panel, which are carefully located so only instrument dials themselves can be seen. Holes must be properly flanged to confine light to dial.

Lamps are located well above centers of instrument dials so all direct reflections not shielded by cover panel are directed down into cockpit. Miniature lamps have been specifically developed for this use. Red color is provided by a plastic lamp cover. Lamps operate from six volts, provided by a voltage dropping resistor, and may be dimmed by means of a rheostat. To further aid dark-adaptation, the entire cover panel and front of mounting panel are painted with non-reflecting type of black paint.



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NEWS

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ANSWERS TO QUIZZES

● NAVIGATION PROBLEM (on p. 18)

- | | |
|---------------|-----------|
| 1. Cus 185.5° | 4. 127.5° |
| Spd 31.5 k | |
| 2. 293° | 5. 1148 |
| 3. 205° | 6. 1235.5 |

(Tolerances of 2 or 3 miles or 2 or 3 degrees from the answers are considered correct)

● BEST ANSWERS (on page 11)

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

● PIX QUIZ (on page 13)

- 7.4 2.2 3.1 4.1 5.2 6.2

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

● Answers to Grampaw's Safety Quiz on Page 8

1. Definitely not. Reference: Parachute Sense, page 23.
2. 3,000 feet. Reference: Flight Safety Bulletin 7-44.
3. Be on the alert for hazardous or unusual circumstances, such as a change of runways. Reference: Army-Navy-CAA Standard Airport Traffic Control Procedures, sec. 1.2202.
4. Danger of flying into the ground. Reference: Flight Safety Bulletin 3-44.
5. For starting, take-off, landing, switching fuel tanks, emergency and altitude operation. Reference: Technical Order 23-44.

**HERE'S WHAT
YOU GET...
WHEN YOU
IGNORE 'EM**



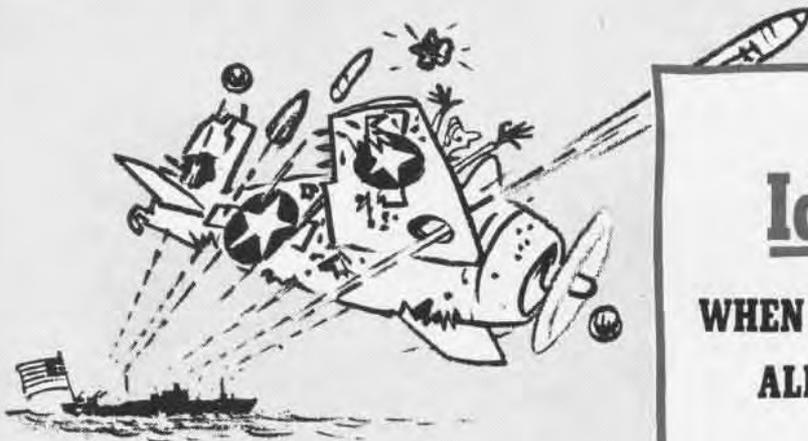
...CUT OFF IN WILL



...CROSSED OFF LIST



...DRESSED DOWN



...RIDDLED WITH LEAD!

Identify

**WHEN APPROACHING
ALLIED SHIPS!**

JAP EMILY BURNS

Emily, one of Japan's latest flying boats, is the first four-engined craft of purely Japanese design. Capable of long-range patrol, they apparently lack armor or self-sealing tanks and have been knocked down in numbers by U.S. planes



1. EMILY'S FOUR ENGINES AND HIGH WING ARE CLEARLY OUTLINED AS U.S. ATTACKER NEARS THE BIG FLYING BOAT AND GIVES IT A BLAST WITH GUNS
2. SHOT DOWN BY ATTACKING PLANE, EMILY SITS ON WATER AND BURNS 3. HEAVY PYRE OF SMOKE MARKS SPOT WHERE JAP FINALLY DISAPPEARS

