

## FOCKE-WULF "FW 200"

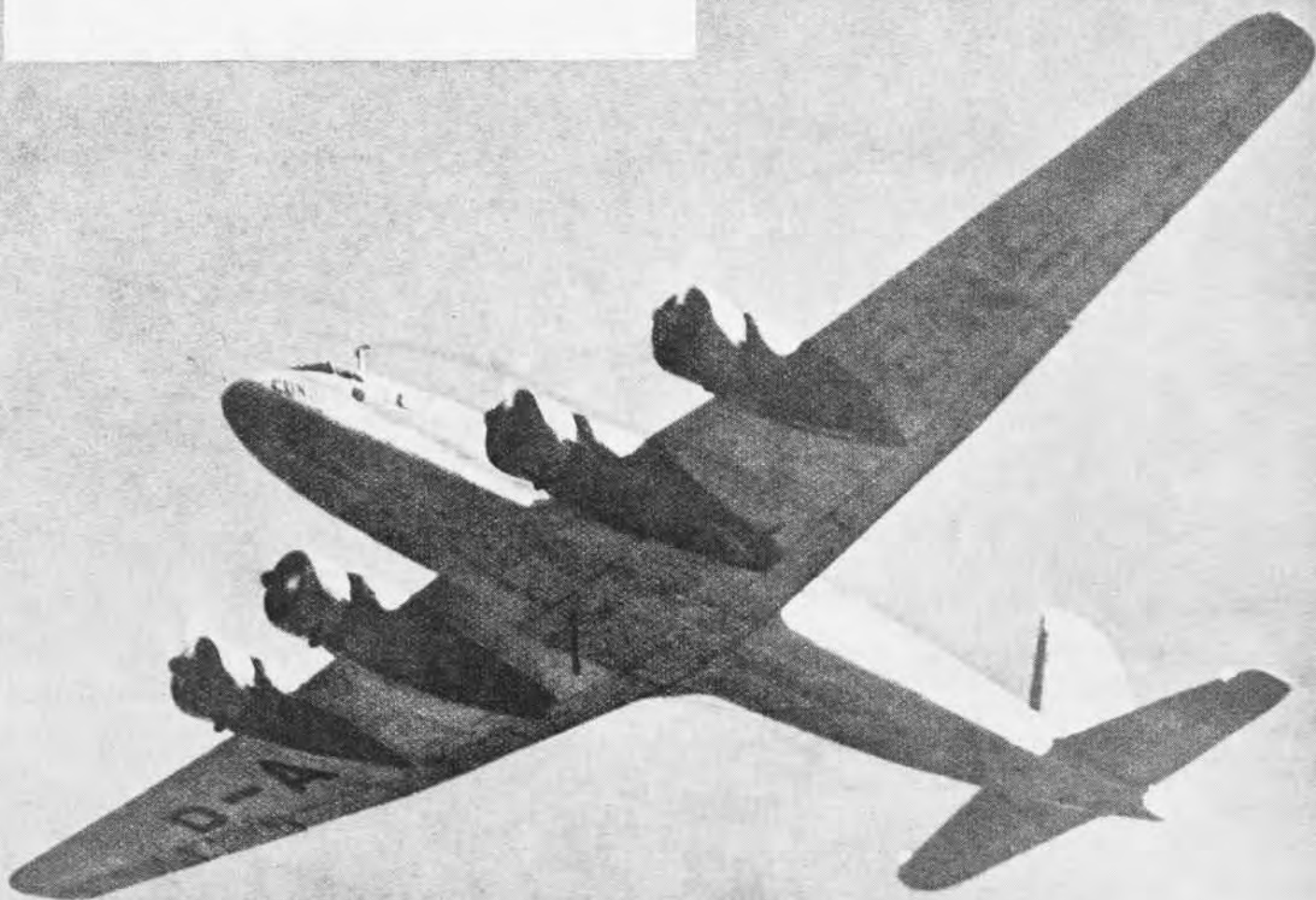
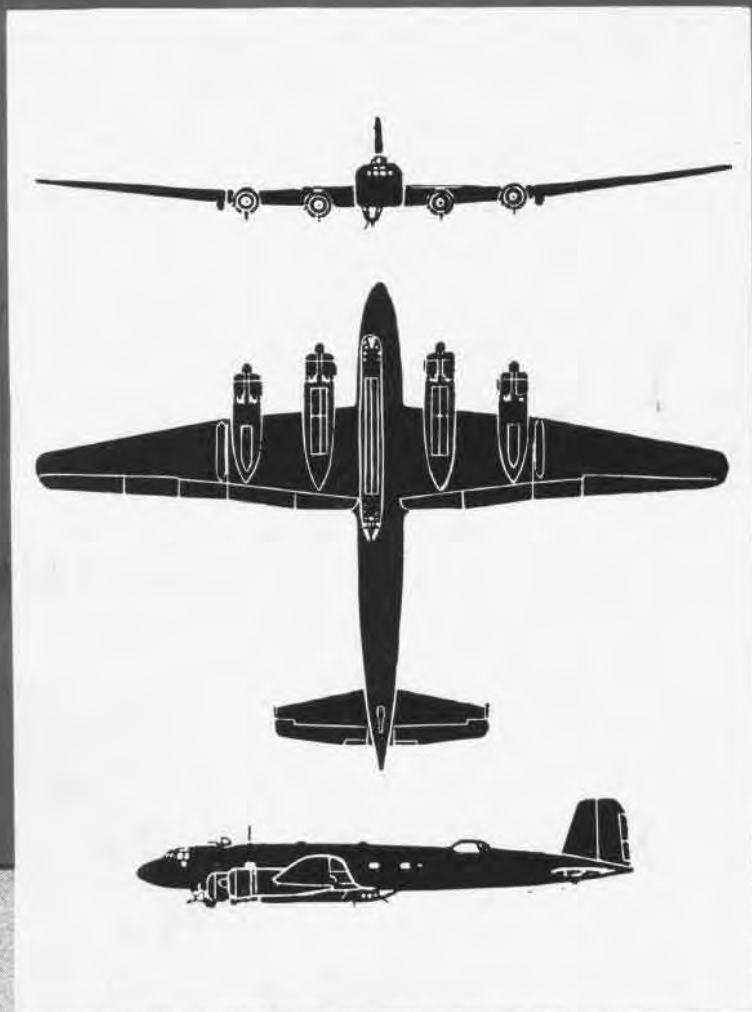
Span: 108 feet. Length: 78 feet

Service Ceiling: 30,000 feet (not loaded)  
21,500 feet (fully loaded)

Max. Speed: 235 m.p.h. at 13,000 feet (loaded)  
250 m.p.h. (unloaded)

**DISTINGUISHING FEATURES**—Low wing monoplane with four radial engines. Tapered wing has wide span, small rounded tips. Fuselage is long, tapering with long offset bomb compartment on under side. Large fin and rudder with blunt top. Tapered stabilizer and elevators have rounded tips.

**INTEREST**—Used extensively over the North Atlantic, this 6-place bomber carries out long-range reconnaissance, mine-laying, and convoy attacks. Against Russian bound convoys, it has been used as a torpedo plane. Known as the "Kurier," this aircraft is a military adaptation of the "Condor," a civil transport, and this accounts for the addition of the long off-center bomb compartment under the fuselage. German submarine "Wolf Packs" are frequently in radio communication with the "Kuriers," which inform them of courses and locations of convoys.





# THE GUNAIRSTRUCTOR

**T**HE GUNAIRSTRUCTOR, new fixed gunnery training device in operation at major naval air stations, has reached a high degree of success in training students the fine science of maneuvering aircraft through gunnery runs. Success of the device was further enhanced following inspection by Army Air Forces personnel who indicated a desire to immediately obtain quantities of the Gunairstructor for adaptation to the AAF gunnery training program.

The Gunairstructor is a mock-up of a fighter plane with cockpit, windshield, wing stubs, stick with trigger unit,

## Though Not Solving All Problems Navy's Training Device Helps Make Combat Gunnery Real to Students

dummy throttle, control rudder, and gun sights. Seated in the cockpit of the Gunairstructor, the student gunner views a seascape and sky on a screen. A plane, the silhouette of an enemy aircraft, is projected on the screen and it is the student's job to maneuver and follow

his target by operating the controls.

The instructor sits forward—tandem style in the fuselage—where the engine normally would be. His station is also fitted with control stick, rudder-pedals, a bank of control switches and a *hits* and *rounds fired* recorder.

In front of both student and instructor is a large rear-projection screen, behind which are located two projectors, the Fighter Projector and the Target Projector. Each projector throws an image forward where a large mirror reflects it back to the screen. (A light-tight housing encompasses the entire assembly.)

# SIGHT AND SOUND OF GUNAIRSTRUCTOR CREATE THE ILLUSION OF COMBAT

WHEN THE Gunairstructor is put into operation, loud sounds simulate the plane's engine noise and the screen depicts a realistic scene, showing what might be seen from an airplane flying at an altitude of eight to ten thousand feet, the target plane being in full vision. By manipulation of his controls the instructor is able to fly his target plane in any direction to practice shots from full deflection around to no deflection. The pilot causes movements of the horizon and landscape in a manner creating the illusion of being in flight. The sound of the engine pouring into the cockpit from a loudspeaker is varied in relation to various maneuvers. When the trigger is pressed the sound of gunfire is also realistically simulated.

Various flight maneuvers of dive,

climb, bank, and turn can be simulated by movements of rudder and stick in the pilot's cockpit. Proper coordination of controls is necessary in order to create the correct illusion. A training gun-sight similar to the Mark VIII sight is mounted in the usual place, and the standard hand grip with trigger button is mounted on the control stick.

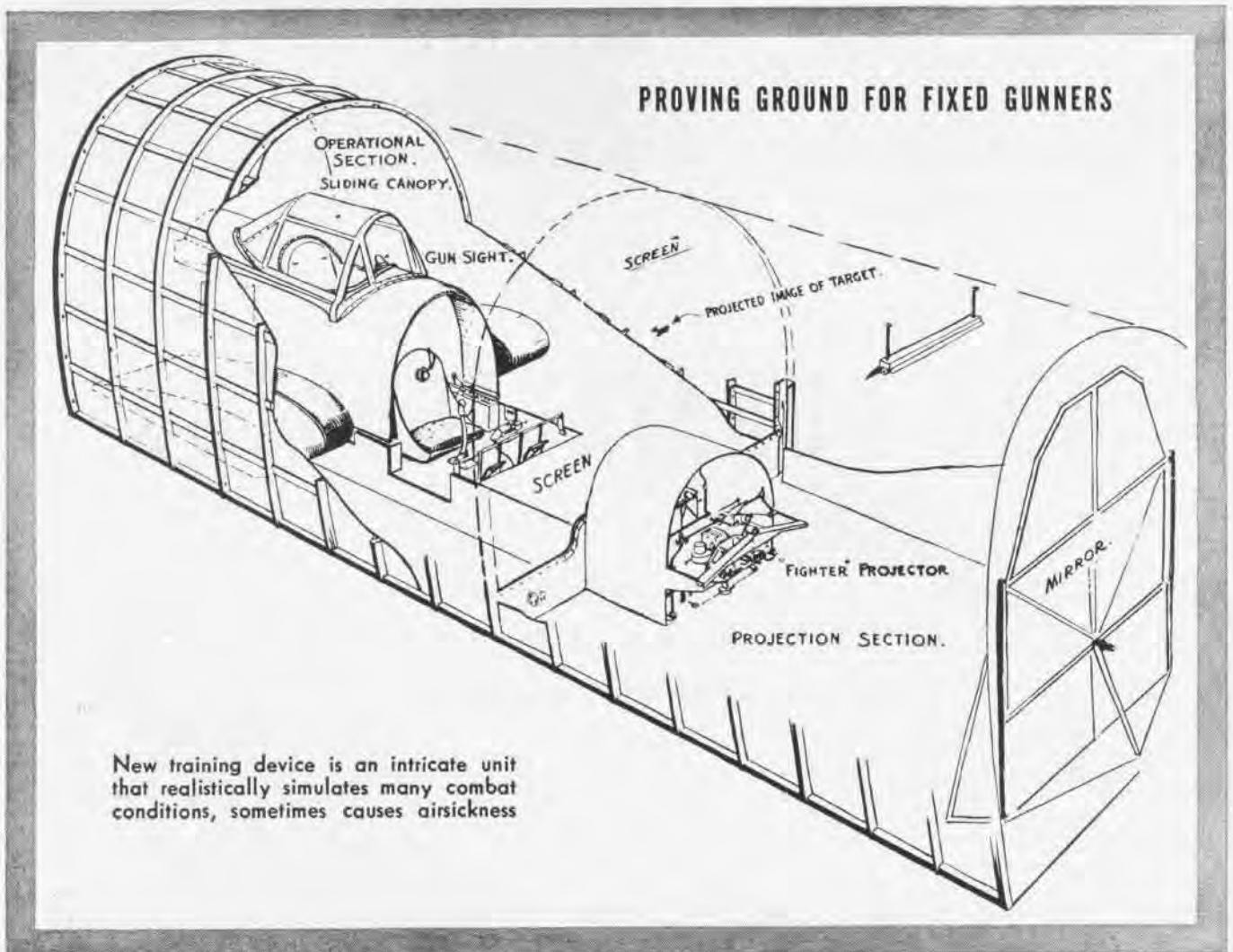
The target plane is projected on the screen against the background of seascape. This plane is flown both by the instructor and the student. Various maneuvers, dive, climb, bank, and turn are all controlled by rudder and stick movements of the instructor. Different attitudes of the target plane can be projected on the screen by a control switch which changes the frames of the 35 mm. film of the target in its projector. In this

manner, stern, quarter, and beam attitudes of the target plane can be presented to the pilot, so that range estimation and deflection are practiced.

## Instructor Freezes Action at Will

Correct point of aim can be demonstrated by the instructor for each attitude of the target. He switches on a light which is projected on the screen whenever the trigger is pressed. This training feature helps the pilot learn estimation of correct point of aim. Whenever he makes a hit on the target, a red flash covers the target plane on the screen, indicating the hit, which is recorded in the counting device.

By means of a target maneuver switch the range may be altered, requiring the student to judge the range and hold his fire until the correct firing range has been reached. During a period of instruction, the instructor, by throwing off his projector motor switches, is able to freeze all action in order to analyze any situation which arises with his student.



New training device is an intricate unit that realistically simulates many combat conditions, sometimes causes airsickness





**GUNAIRSTRUCTOR IS A TWO-MAN MECHANISM IN WHICH THE INSTRUCTOR ATTEMPTS TO OUTWIT HIS STUDENT BY MANEUVERING TARGET ON SCREEN**

This is a very desirable feature in teaching range estimation, and the correct mil lead for a particular situation, as such instruction cannot be duplicated in actual flight. The switch turning on the "correct-point-of-aim-light" enables the student to compare estimated point of aim with indicated correct point.

Electrically operated, the Gunairstructor's power requirements are 220-110 volts, A. C., 60 cycle, 15 amps. or 110 volts, A. C., 30 amps. Gunair-

structor dimensions are: 35 ft. long, 11 ft. wide, 10 ft. high. The trainer can be placed in the hangar or some convenient place on the station.

Training of enlisted personnel for operation of the Gunairstructor is arranged through the Bureau of Aeronautics, Special Devices Division. The training period is one month. Those who wish to operate the Gunairstructor should have a knowledge of flying and link trainer experience. Maintenance

men should have radio, electrical, or mechanical experience.

It is felt that the Gunairstructor, with all its desirable features, does not solve all problems of the fixed gunner, namely the important problem of where and how to commence the approach. However, increased accuracy and better procedure in making approaches have been reported by all activities using this device in fixed gunnery training as one phase of a comprehensive curriculum.

# GRAMPAW PETTIBONE

## Attention Crane Operators

A tractor crane was parked on an incline at a naval air station to make a lift. Pick-up was made on the up-hill side of the tractor and the load then was swung around to the down-hill side. What do you think happened?

Right; the whole crane tipped over and smeared a PBM-3-S. Estimated damage, \$26,636.



*Grampaw Pettibone says:*

Side lights on this accident are: This was a very experienced crane operator and it was absolutely unnecessary to make this lift with the crane parked on an incline. All of which goes to show that operating a crane is exactly like operating a plane; each requires a lot of common sense.

*Additional side light:* the pilot of this crane was temporarily suspended from duty involving the crane operation.

## The Right Way

Part of a letter from Bombing Squadron 134 to Grampaw Pettibone is quoted as of general interest:

"Dear Grampaw Pettibone:

"... and our pilots are probably the foremost authorities on, and masters of, single engine procedure in these parts. This is for the record:

"a. Five weeks ago a pilot had a scavenger pump failure at 100 feet (!) while making an A/S run. The engine froze tight and he brought it back on one engine. Since then—

"b. The fuel line connection to the droppable wing tank came loose on one plane. The engine started running roughly because of slugs of air getting into the gas line. The pilot brought the plane back on one engine.

"c. The propeller governor on another plane froze and chewed up the gear train; the propeller went up to



full speed. The pilot brought it back, mostly on one engine.

"d. On another plane, the hose going to the droppable wing tank had deteriorated and failed; the fuel pump became air-locked. The pilot brought it back on one engine.

"e. When the valve operating cam on another airplane failed, the pilot brought it back on one engine.

"f. During an engine run-in flight, the pilot feathered the propeller for test. When he could not unfeather it, due to a high pressure oil line failure, he brought the plane home on one engine.

"All single engine approaches were made properly, *i.e.*, they came in high right up to the end of the runway to avoid undershooting, and there were no casualties.

"Thought you might like to hear of something being done the *right* way, for a change."



*Grampaw Pettibone says:*

Right and bravo! Pats on the back for pilots a. to f. inclusive.

Sure I'm glad to hear of such shining examples of brains and skill! It shows these pilots have had proper emergency drills. They were prepared and knew what to do when trouble occurred.

Unfortunately, I'm not a member of the Board of Awards; I'm in the "Kick-in-the-Pants" Division and work on the

psychological principle that you learn more from seeing someone make a mistake and come to grief thereby, than by watching an expert do it the right way. (For example, to see one man crash and burn up because he forgot to lower his wheels on coming in to land is more apt to make you remember to lower your own wheels than to watch a hundred perfect, wheels-down landings.) Hence, the dumbbells get all the publicity; they are the warning signs for aviators on things to avoid and how not to do it. For the experts, the virtue of accomplishment is its own reward; not to mention the added reward of being on hand to collect longevity fogies.

## Fuel Unconsciousness

The pilot of an SNJ-4 made the following statement after his engine coughed and quit on him, one hour and ten minutes after take-off on a towing flight:

"I was at 3,500 feet when my engine stopped, I immediately turned on full preheat, worked the throttle and gave the wobble pump several strokes, but . . .

"As soon as the plane hit and nosed over, I realized that the gas tank, on which the engine was operating, had run dry and that the engine stopped because I failed to turn my fuel selector valve to the left tank."



*Grampaw Pettibone says:*

How's that for snappy mental reaction!?

## The High Price of Ignorance

During his landing approach, an SBD-5 pilot (305 hours) inadvertently opened his diving flaps, instead of his landing flaps. The resulting (and unexpected) increase in drag was just enough to cause the airplane to stall and spin in from low altitude. *Result:* one temporarily crippled aviator and the permanent loss of one good airplane.



*Grampaw Pettibone says:*

I'll say it again, "You've got to know your cockpit." If you'll just stop and think a minute, you will realize that you can't possibly make a visual check every time you pull, push or twist some gadget in the cockpit. You must know their

CALLING ALL SQUADRON COMMANDERS

SIR! WE'VE ONLY GOT ONE OXYGEN MASK!

Does EACH PILOT  
Check PLANE GEAR  
Before EACH FLIGHT



exact location and "feel," so you can put your hand on any one of them and operate it without a moment's hesitation and without having to poke your head in the cockpit to see what you are doing. That's why I've been hollering my head off for the past year to get you to spend as much time as you can on "cockpit drill."

And I'd like to remind the "smart" guys, who may not think this is necessary, that pilot error is still responsible for about 70% of all aircraft accidents, and that a great deal of this pilot error is attributable to "lack of familiarity with equipment."

Remember the word from the Fleet: "A pilot is no damn good in combat as long as he has to think about handling his plane."


## Dilbert's Dilemma

*When I left home, my Mother warned,  
"Now Dilbert, do be careful!  
Don't fly too high, don't fly too fast;  
And do land slow and easy!"*



*At flying school an Ensign warned,  
"Now Dilbert, do be careful!  
Don't fly too low, nor yet too slow;  
And land with plenty of speed!"*

*What should I do, and who believe;  
How high to go and at what speed?  
I know Ma wouldn't tell me wrong,  
But this Ensign's my instructor!*

 **Grampaw Pettibone says:**

See Navy Regs., Art. 89(2) on "what to do in case of conflicting orders."

## Non-Rubber-Neck Again

Three two-plane sections took departure at five-minute intervals on a night navigation training flight. At the end of the first leg, the second section overtook and passed the first section. Three minutes later, the third section, in making its turn to the second leg, overran the first section. The first section wingman saw the imminence of a collision but had no time to warn the other planes as he dived clear. The two section leaders collided and their planes

crashed out of control. One pilot and two radiomen were killed.

It was the opinion of the trouble board that this collision was caused by both section leaders concentrating on their navigation to the exclusion of all else and relying completely on their difference in time of departure to safeguard them from the possibility of collision.

## Active Month for Dilbert

Marine Base Defense Air Group 42 has submitted a résumé of certain accidents occurring in the group, each with a moral for aviation personnel. Read 'em and learn.

1. A fatal crash occurred when a TBF made a forced landing at sea after an engine failure. The pilot made a good landing, but lowered his flaps and wheels during his approach. The plane flipped over on its back, and before a rescue plane or crash boat could arrive at the scene, crew and plane had disappeared.

2. The Dilbert-of-the-month was an assistant plane captain who was warming up an SNJ. He failed to keep brakes on, and when he revved up the engine, the plane jumped its chocks. When silence again settled on the apron, the SNJ and two TBF's into which the "J" taxied were in need of major repairs, and Dilbert required some minor repairs himself.

3. Two pilots made parachute jumps from disabled FM-1's. The most obvious result of these "leaps for life" is renewed faith in the boast that "a Navy parachute has never failed." In fact, it would appear that the pilots are becoming too parachute conscious, for in one of the jumps, the pilot left his plane before determining whether any corrective measures could be taken.

4. Other outstanding Dilberts for the month were two FM-1 pilots who made forced landings because of lack of fuel. One flew his entire hop on the emer-

gency tank. The tank ran dry in the traffic circle, the pilot attempted to make a down-wind landing, but fell 10 yards short of the runway, resulting in major damage to the airplane. Another flew a two-hour combat hop, then attempted a landing using his main fuel tank. He was given a wave-off by the signal officer because of congested traffic conditions on the field. Shortly after he left the field for his second approach, his engine failed, and he made an emergency landing in the water. The aircraft ended up in major overhaul.

As a result of the last two mishaps, the fuel tank indicator consciousness of the pilots is little short of amazing.



**T**HIS major-damage accident resulted from a student's attempt to hit a circle shot by cheating; while making a half "S" turn approach, he saw that he was overshooting and tried to "mush" in. The plane stalled high, and dropped in about 20 feet.

Circle shots are precision maneuvers included in primary training for the specific purpose of developing technique and judgment. If students cheat during this practice, they are only cutting their own throats. Instructors are urged to stress correct approach, proper air-speed and planning of precision landings, rather than exact point of landing.

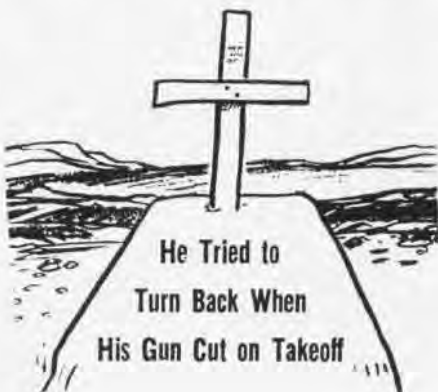
## Strafing Altitude

Following a "masthead" bombing run, the pilot (307 hours) of a TBF-1 maneuvered his plane to enable the rear gunner to strafe the target. He was observed to be unusually low and, while making a steep left turn, his wing tip made contact with the water, causing a fatal crash.



**Grampaw Pettibone says:**

This is the logical result of violent maneuvers at such low altitude. One is apt to lose some altitude in a sharp turn, not taking into account the added depth of the plane when a wing is down. Anyway, a pilot on a strafing run should never get so low as to require his full attention to keep from flying into the water; you need some altitude to have room for sharp, evading action. "A word to the wise" should be sufficient.





# Recoopering Air Cargo



WHEN IT costs a couple of dollars a pound to ship vital war materials by naval air transport from New York to Honolulu, the reason for the Navy's new program of repacking air cargo to cut weight and size can be understood. Repacking enables NATS to carry up to 35 percent more freight.

The program calls for BuSandA to establish overseas air cargo terminals at New York, Miami, San Francisco, Seattle and Patuxent River, Md. Limited opera-

tions at the Miami station alone in seven months saved 77,062 pounds on naval supplies destined for war fronts.

When shipped by air, the materials do not need to be packed so heavily or strongly as they would be if sent by cargo ship or train, where they would get rougher handling. This entails some education by the Navy of manufacturers who in the past learned by experience to put their products in the strongest boxes.

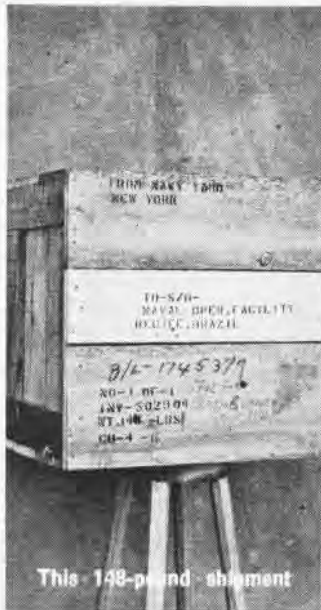
The speedier transit by air is becoming so popular the Navy's transport squadrons are expanding rapidly. Hun-

dreds of tons of freight are moved weekly by the four types of planes used: R4D, R5D, PBM-3R AND PB2Y-3R.

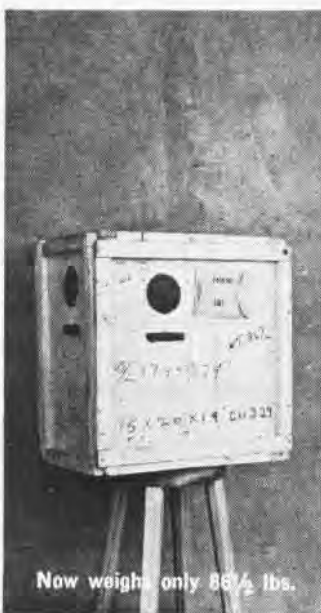
## Specially Trained Men Handle Work

Terminals are in charge of Supply Corps officers specially trained to handle such problems as receiving, repacking, rebilling, tracing, stockpiling and forwarding shipments to airports for out-bound loading. In the past facilities and personnel of supply departments at naval air stations were employed in handling overseas air shipments but the job got too heavy as Naval air transport grew.

**BEFORE**



**AFTER**



## HOW THE NAVY REPACKS ITS CARGO

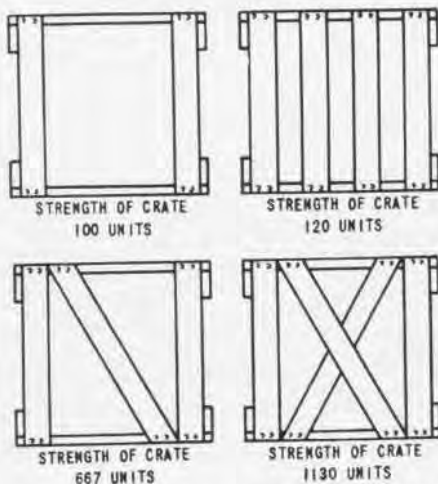
**T**OTAL saving of 77,000 pounds at Miami alone is equivalent to the cargoes of 17 fully loaded R4D airplanes. Packers' ability to eliminate pounds in shipments has increased the NATS' ability to carry larger pay loads, which range all the way from three-ton gears for disabled cruisers to drop tanks for *Wildcats* at Guadalcanal.

When war materials in their customary strong, heavy crates reach the air terminals they are repacked in fiberboard, plywood or pasteboard cartons to cut down on size and weight. At the same time the box is checked for correct contents and damage.

Some shipments go part of their way by train before being put on transport plane for overseas shipment so must be packaged strongly. Sometimes these packages are prepared for air shipment then repacked inside a stouter box which is removed at the air terminal.

### Many Pounds Saved by Repacking

Eight pistons for a ship arrived at the terminal in two-inch lumber boxes. They were repacked in one-inch plywood boxes, saving 44 pounds each. Two aviation tires in a crate were removed and tied together with steel strapping, lopping off 400 pounds. Radio equipment for a Brazil point was repacked in a plywood box 62 pounds lighter than its original wooden container. A small foot-square package was taken out of a 22-pound wood-box and reshipped in a pasteboard carton weighing 1½ pounds.



CROSS-SLATS ON BOXES INCREASE STRENGTH



The Containers and Materials Handling Section, Air Borne Cargo Unit of BuSandA has issued a handbook on *Packing and Materials Handling of Air Borne Cargo*. The pamphlet is a comprehensive guide for preparing material for air shipment and is being issued to naval personnel in the field.

Occasionally, because of too heavy a backlog of shipments at terminals, some air freight has to be sent by ship al-

though packaged for air. It is given top-hold position in the ship or carried in special rooms to prevent damage.

Officers and men who are assigned to terminals receive training in packaging at a special Navy school located in Wisconsin. There also manufacturers' representatives study materials and structural weaknesses of boxes and crates and learn the best types to use for safe transit. Part of the training is in repackaging.

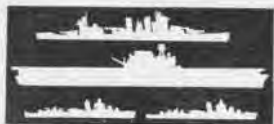




# FROM 1,076 TO 14,072 SURFACE VESSELS

EACH SYMBOL REPRESENTS 1,000 VESSELS

JULY 1940



1,875,000 TONS

JULY 1943



ALMOST 5,000,000 TONS

Naval Aviation News CHART

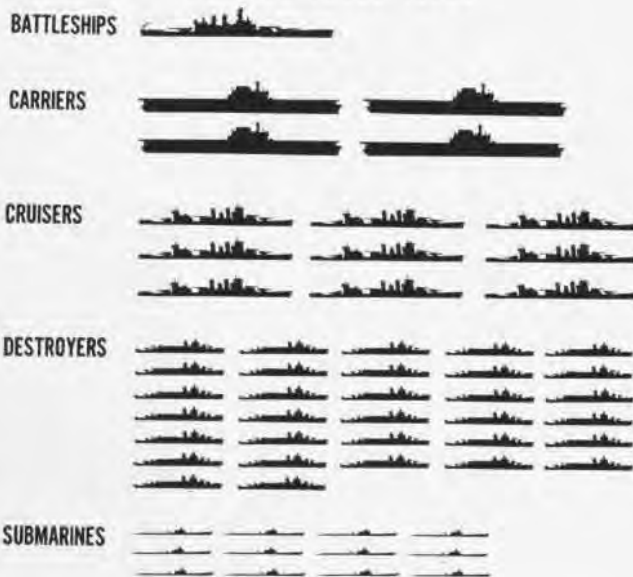
# GROWTH OF NAVY

WHILE ITS vessels and planes have patrolled the seven seas, the Navy back home has been at work on a mammoth production task. Though not by any means finished, it has issued an interim report indicating a "phenomenal expansion of shipbuilding unequalled in history." Figures given out include production of surface vessels of all types and aircraft during a three-year period—July 1, 1940, to July 1, 1943.

The tonnage produced is so vast that, in itself, it would be one of the largest naval forces afloat. The "new fleet" includes 333 combat vessels, 1,274 mine craft and patrol craft, 151 auxiliaries, 654 yard craft and district craft and many thousands of landing craft. In the same three years, the Navy completed more than 16,000 planes.

Plane production has shown a big increase. In the 18 months between January 1, 1942, and July 1, 1943, it quadrupled. Combat planes doubled in the year 1942—and redoubled. In the first half of this year it approximately doubled again.

## LOSSES OF FIGHTING FLEET FOR PAST THREE YEARS



Transferred to other nations or converted into non-combat vessels



129

TOTAL LOSSES 187 VESSELS 484,521 TONS

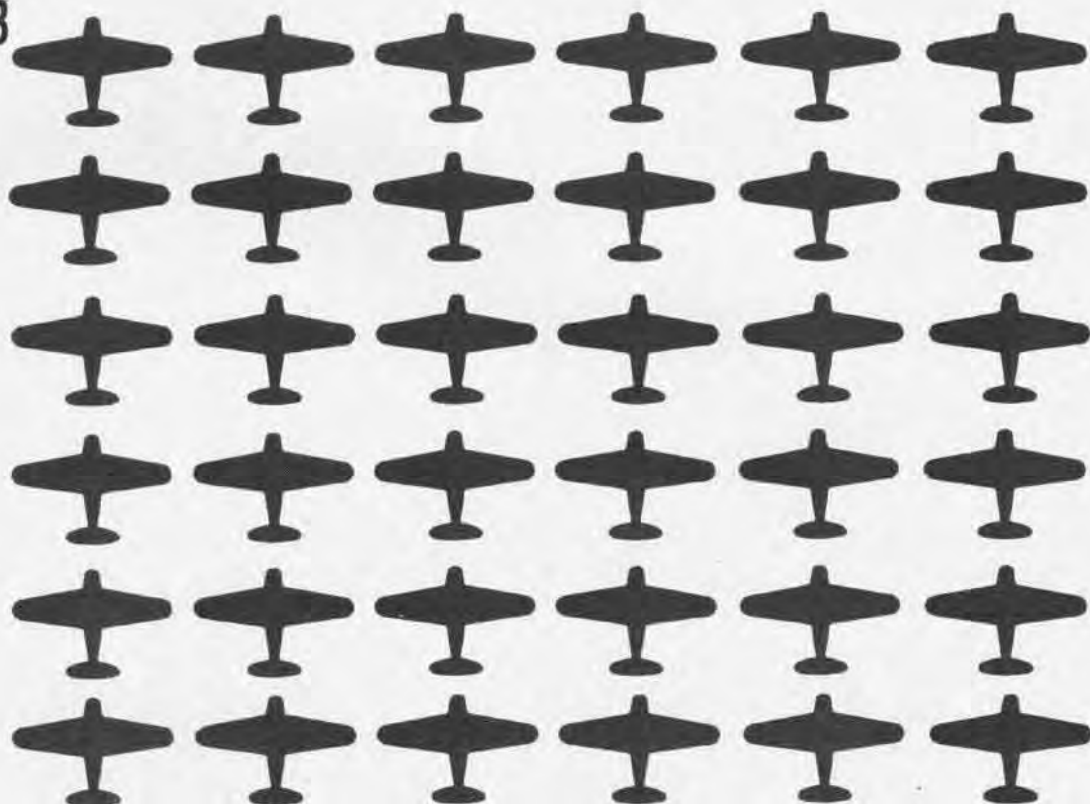
# NAVAL AVIATION HAS FORGED AHEAD

(PLANES ON HAND)

JULY 1, 1940



JULY 31, 1943



EACH SYMBOL REPRESENTS 500 PLANES

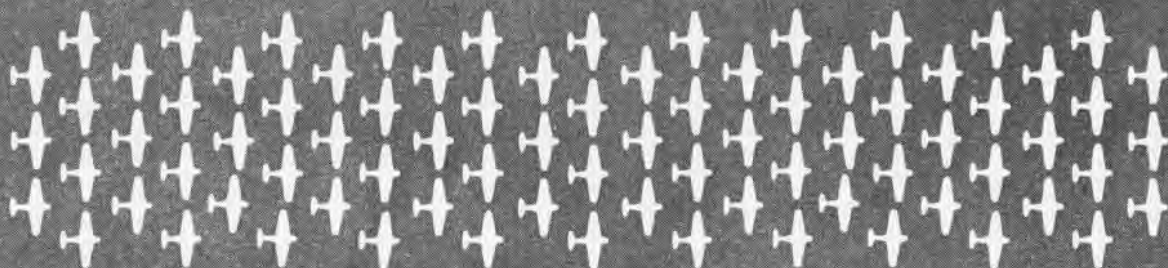
Naval Aviation News CHART

## INCREASE IN MONTHLY PLANE PRODUCTION

JULY 1940



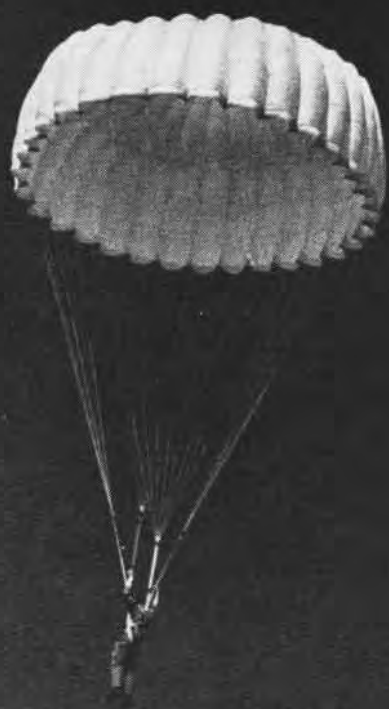
JUNE 1943



EACH SYMBOL REPRESENTS 25 PLANES

Naval Aviation News CHART

NYLON





# SUCCESSOR TO SILK

THIS is the story of a search for a substitute for silk that ended in discovery of a material more suitable and more adaptable than silk. When parachutes were used first, foreign sources had to be depended upon almost entirely for materials. Immediately after adoption of the parachute, naval engineers initiated a program to convert this domestic invention to an entirely domestic product by developing materials produced wholly within the United States.

This development created a major problem because of the superior characteristics of materials used originally—silk for canopies and shroud lines, and linen for harnesses. Silk is extremely strong and has a relatively low weight. It also has the desirable property of not losing its natural resilience after it has been tightly packed for long periods. Linen has strength, ruggedness, durability.

In the first search for a domestic substitute for silk, it was natural to turn to cotton, the country's most common textile product. Difficulties were encountered with sources of supply since cotton fabrics were not produced commercially in the light weight required for parachutes (1.6 oz. per sq. yd.).

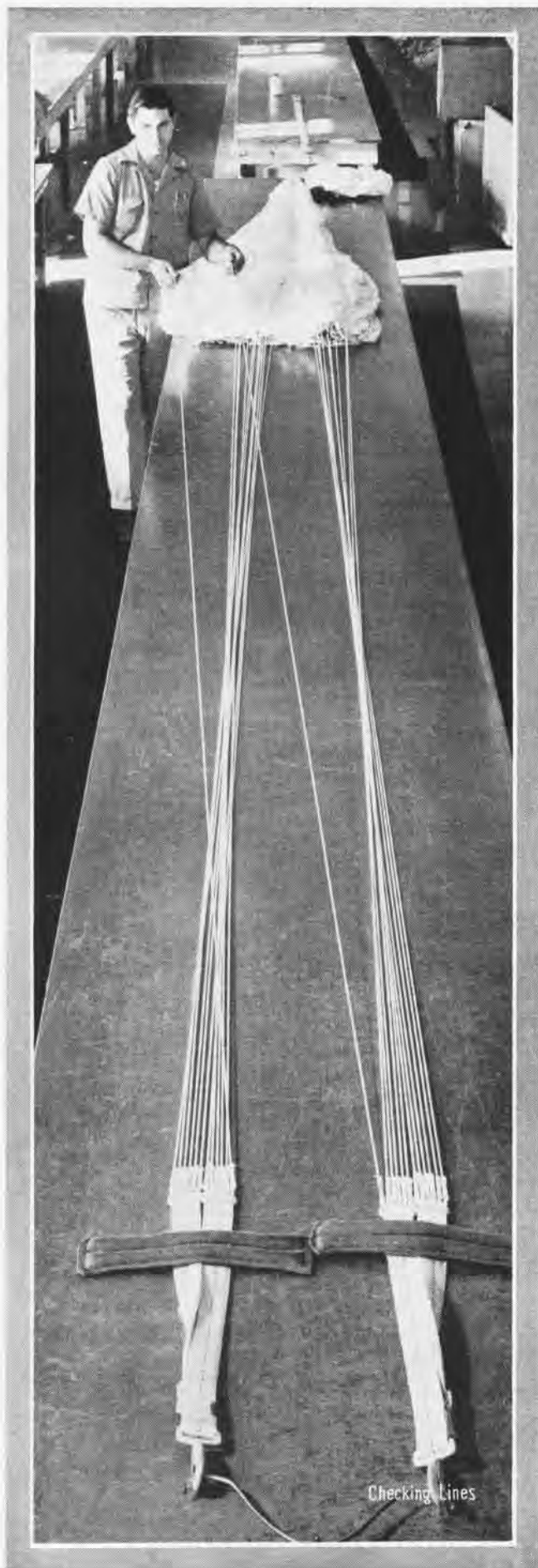
Cotton manufacturers hesitated to begin a project of fine goods production, there being no outlet for rejected material. They recognized, too, that exacting requirements of parachute manufacture would result in rejection of cloth not absolutely perfect. Sample cotton fabrics were obtained, however, and experimental parachutes fabricated and tested. These tests indicated that cotton did not have the inherent springiness of silk, would crease when folded and "retained" in a compressed state between packings.

## **Cotton Tried, Shelved for Use Only in Silk Shortage**

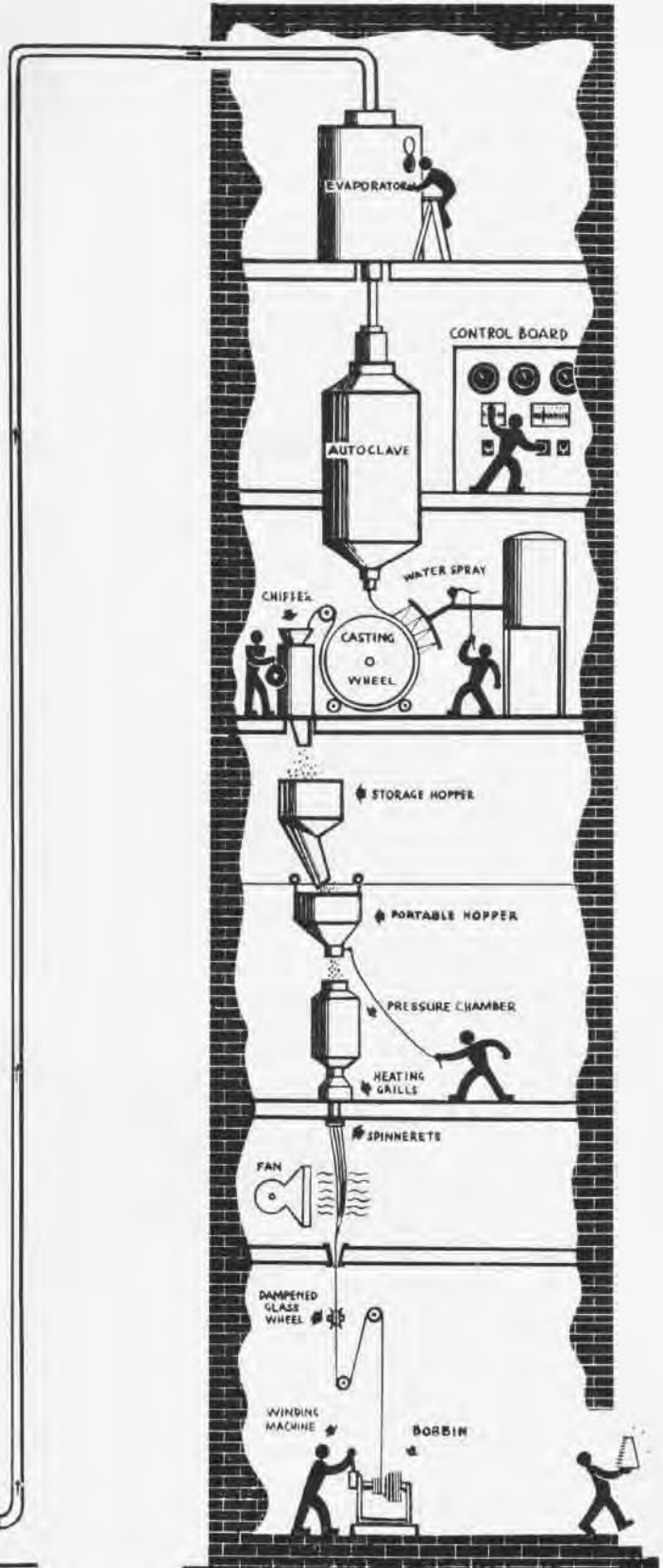
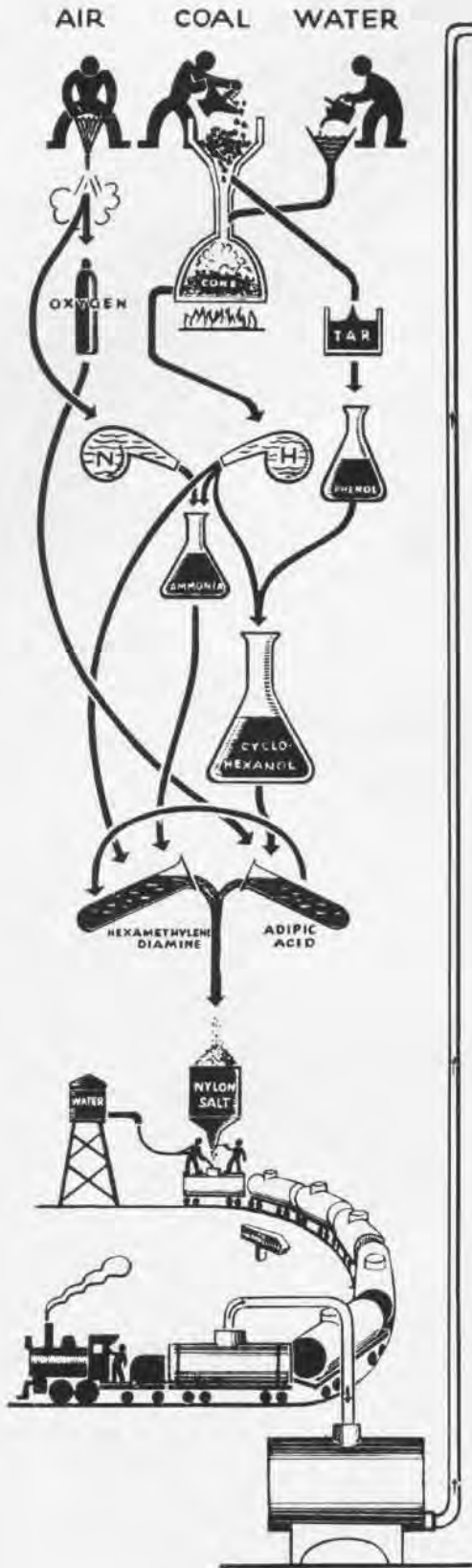
The opening rate of cotton parachutes was retarded to a perceptible, but not dangerous degree. Nevertheless, it was demonstrated that cotton parachutes could be manufactured and used successfully if required. Specifications were prepared and the development shelved until an emergency might reduce the amount of the then readily available silk.

Rayon also was investigated, but it was found that it has the inherent characteristic of losing strength and stretching out of shape when wet. Although the possibility is remote that the parachute may become saturated before or during the time it is subjected to the greatest stress—which comes in the initial impact loading shock—rayon was considered unsuitable for use in man-carrying parachutes.

Meanwhile, chemists of the du Pont Company were at work on a revolutionary new synthetic yarn termed "nylon." Nylon is the first real synthetic textile, since other so-called synthetics are merely a conversion of cellulose base raw materials into thread form. Nylon is the product of coal, air and water, which are entirely unrelated to the component elements of other textile materials. It has become the successor to silk.



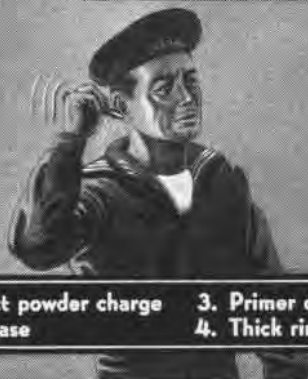
# HOW NYLON YARN IS MANUFACTURED



# What do you know about ARMAMENT?

1

This gunner is testing for . . .



- 1. Correct powder charge
- 2. Split case
- 3. Primer defect
- 4. Thick rim.

18

2

This stoppage may be caused by . . .

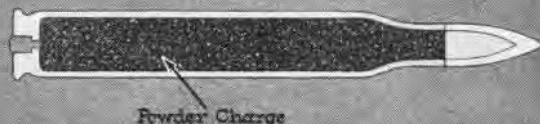


- 1. Faulty head-space adjustment
- 2. Worn or broken T slot
- 3. Defective firing mechanism
- 4. Broken barrel locking spring.

68

3

One advantage of high-intensity powder is . . .

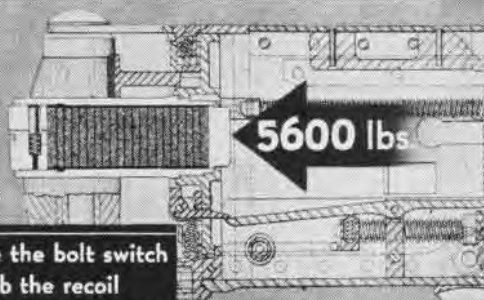


- 1. It gives instant, extreme chamber pressures.
- 2. It builds up pressure gradually.
- 3. It does not foul the bore.
- 4. It is not affected by temperature.

7

4

One function of the back plate group is to . . .

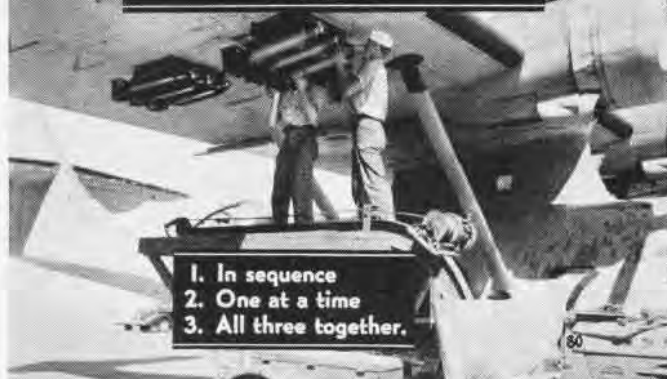


- 1. Guide the bolt switch
- 2. Absorb the recoil
- 3. Mount the gun sights
- 4. Speed up the bullet

32

5

To release 100-pound bombs manually, release . . .

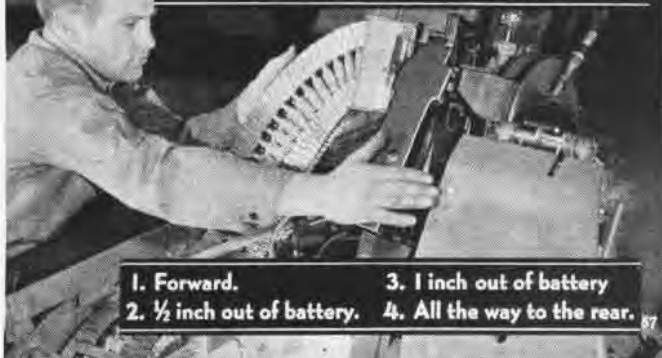


- 1. In sequence
- 2. One at a time
- 3. All three together.

86

6


For correct gun operation, the cover plate should be closed when the bolt is . . .



- 1. Forward.
- 2. 1/2 inch out of battery.
- 3. 1 inch out of battery
- 4. All the way to the rear.

87

Aircraft armament got its start in World War I when an aviator took a pot shot at an enemy pilot with his pistol. The airplane has come a long way from the pistol-packing days. It has been developed into the deadliest weapon of World War II. Try your luck at these armament questions. Answers are on page 32.



*Write your answers here*

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



NAVAL AVIATION

# NEWS

NYLON  
FOR PARACHUTES  
Page 10



Pilot's Day on a Carrier  
Recovering Air Cargo  
NANews Chart: Navy Growth

Nov. 1, 1943  
RESTRICTED

# NYLON MAKES TODAY'S PARACHUTE SUPERIOR

POSSIBILITIES of nylon for parachute use were recognized immediately, and the Navy obtained samples from one of the very first lots of cloth woven experimentally. Nylon had a greater strength-weight ratio than any other textile material then known. That is, its strength is greater than silk or other materials for a given weight, or its weight can be reduced and yet maintain comparable strength. Because of its composition, nylon resists mold, mildew, fungus growth, and attack of insects. Man-made, its production and quality are not dependent upon weather, climate, favorable seasons.

Ingredient materials can be kept on hand to permit year-round manufacture. Manufacture can be controlled scientifically and size and physical characteristics of the product altered to suit different uses. These properties created great interest in nylon, and the Navy negotiated the first contracts awarded for nylon parachutes.

After exhaustive tests to determine speed of opening, rate of descent, performance in comparison with silk, and strength of assembly, nylon parachutes were issued to service activities in 1940. They had no special markings other than serial numbers. This precaution was taken so they would not be given special treatment by users or riggers or be held back because of prejudice against changes.

The few initial nylon parachutes have been supplemented by production deliveries and now may be found among almost any group of parachutes. Because of the background of experience and the care which has been exercised in manufacture of fabric and fabrication of parachutes, there need be no fear or hesitancy in trusting the performance of nylon parachutes. Nylon is no longer considered a substitute for silk. It is regarded as a superior product.

## Nylon Shroud Lines Absorb Shock Better Than Silk

Because of the difference in elasticity or elongation characteristics of silk and nylon, silk thread cannot be used to sew nylon cloth, and vice versa. For the same reason, reinforcing tapes and webbings which are strength members or which are subject to strain or impact, should also be of same material as the body of the parachute so that stretch and load carrying capacity is equalized. In present nylon parachutes all collateral materials entering into assembly of canopy and suspension systems are nylon.

Nylon thread being more elastic than silk, nylon shroud lines have a cushioning effect in absorbing impact shock resulting from braking action of the opening canopy. Thus the wearer of a nylon parachute feels less shock in a jump than the wearer of a silk parachute. Also, higher tensile strength of nylon provides a greater margin of safety.

In changing from linen in parachute harness webbing, cotton was the only fiber which appeared suitable. However, all-cotton webbing of the same strength was too bulky to permit use of existing hardware fittings. Since it was impractical to change fittings and have two different sizes in service, nylon replaces cotton in filling threads of webbing, maintaining thickness at the same value it had been in linen webbing.



PARACHUTE IS ASSEMBLED AFTER RIGID INSPECTION AND CAREFUL PACKING



RIGGER CAN REPAIR DAMAGED EQUIPMENT SO THAT IT IS GOOD AS NEW



WORKERS GIVE STRICT ATTENTION TO ASSEMBLY OF PILOT CHUTE FRAMES

SPT Franklin Bell



WITH NO MARGIN FOR ERROR, FACTORY INSPECTORS AIDED BY POWERFUL LIGHTS SEARCH EVERY SQUARE INCH OF PARACHUTE CANOPY FOR DEFECTS

## NYLON CHUTES ARE TOUGH AND HUSKY

**T**HE FOUR essential requisites of parachute canopy cloth are weight, strength, tear-resistance, porosity. **WEIGHT** must be held within close limits so that bulk of the cloth (approximately 65 square yards for a 24-ft. canopy) will be correct for encasing in a standard container or pack. If it is too heavy, the pack will be unnecessarily hard to close; if too light, pack will be loose and sloppy. **TENSILE STRENGTH** and **TEAR-RESISTANCE** must be adequate to provide the strength of assembly desired for safety. **POROSITY** directly governs performance characteristics such as time of opening and rate of descent of the parachute.

If the cloth is too tight to prevent proper flow of air, the parachute will open faster and produce greater strain on canopy and greater shock to jumper. If weave of cloth is open to give a high porosity (air flow), opening speed will

be slow which may be dangerous in jumps from low altitudes. Besides opening and shock characteristics, porosity controls rate of descent and stability of the parachute. Tightly woven fabric with low porosity will cause the parachute to descend slower, but also tends to increase oscillations or swaying motions. Oscillations are produced by building up of pressure within the parachute by reason of resistance to passage of air through the cloth—with the result that the excess air spills from under the edge, causing a swaying or swinging motion of the object being carried.

Physical properties of the cloth are related directly and closely, and any alteration in construction affects all properties and ultimate performance of the parachute. Even minor deviations, such as a small change in thread size, upset the balance between these established requirements and are reflected in the functional characteristics of the chute. It can readily be understood why extreme vigilance must be exercised constantly to maintain quality of the materials used in parachutes and why substitution of other materials for silk could not be solved by a formula, but had to be arrived at by the longer and more painstaking "cut and try" method. The care and trouble experienced in the years of experiment have been more than compensated by results obtained in actual performance.



## ORIGIN OF PARACHUTES

**N**OBODY seems to know who had the original idea for constructing parachutes. Probably it was suggested by observing pods of several plant seeds which have shapes similar to that of a parachute.

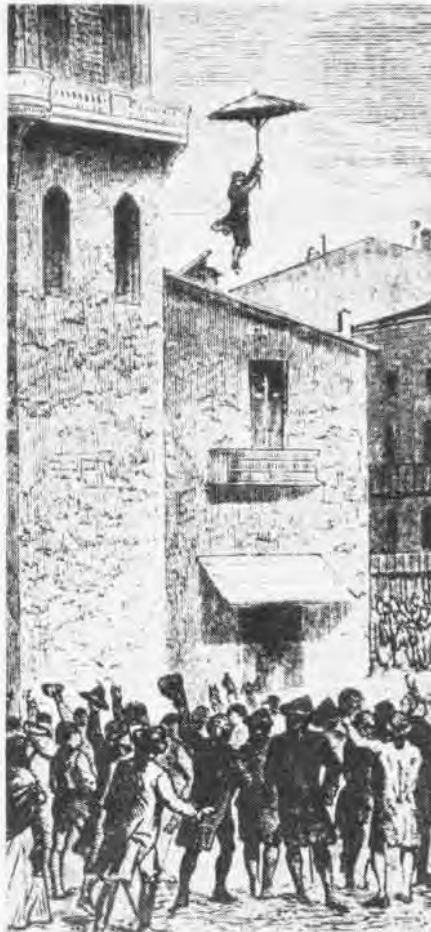
The first authentic record of a device such as the parachute is contained in the notes of Leonardo da Vinci. In 1495 he accurately described the principles of parachute operation and made a drawing which showed a pyramid of cloth suspending a man in the air. Said da Vinci: "It would enable a man to let himself fall from any great height without injury to himself." Although his design apparently was sound, there is no record of anybody having constructed da Vinci's parachute.

### **Siamese Tumblers Were First Jumpers**

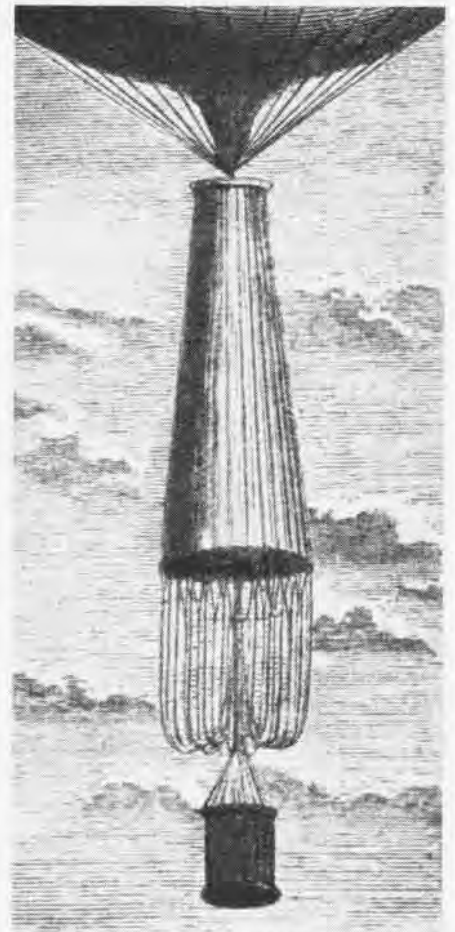
History is vague about who made the first parachute for actual use. Supposedly, tumblers of ancient Siam jumped from high places with umbrellas fastened about their waists. If true, theirs is the distinction of being the first parachutists. They were much earlier than Fauste Veranzio who, in 1617, jumped from a high tower in Venice. His chute consisted of a square wooden frame-work covered with canvas.

Everyone considered early experiments with parachutes as stunts. It is doubtful if any of the old timers thought they would ever have any practical value as life-saving devices. Some considered them as a means of escape from high buildings. But, as there were not many high buildings, nobody took the possibility of such escape seriously.

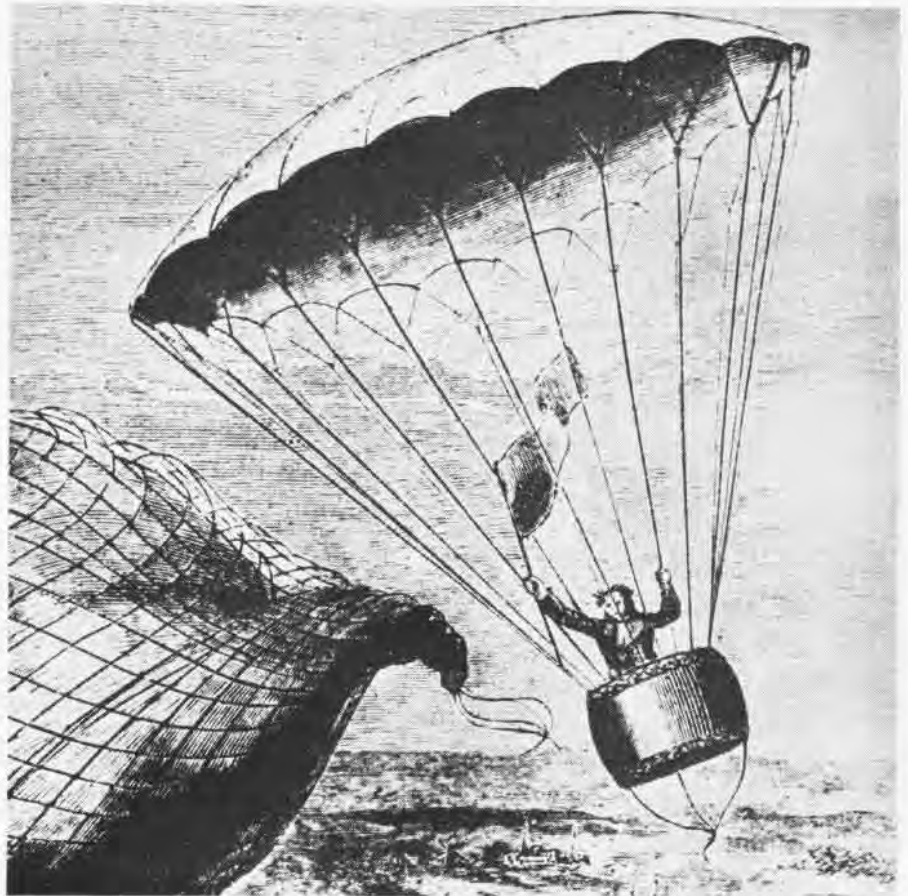
In 1783 a Frenchman made a safe descent from the tower of Montepellier. The experiment caused little comment, and history doesn't record the intrepid fellow's name. There were other jumpers from time to time, but it was not until 1808 that Jodaki Kuparento, a Polish balloonist, made what is believed to have been the first emergency descent. High above Warsaw, Kuparento's balloon suddenly caught fire. Quickly freeing his parachute, Kuparento floated safely to earth, qualifying as the undisputed original member of the Caterpillar Club.



FRENCHMAN "BAILED OUT" OF TOWER IN 1783



EARLY PARACHUTE WAS ATTACHED TO BALLOON



LIFE-SAVING POSSIBILITIES OF PARACHUTES BECAME OBVIOUS WITH DEVELOPMENT OF BALLOONS

# THE JUMP

[NYLON . . . CONTINUED]



**1** Jumper grasps rip-cord handle while standing at door



**2** Leans forward in jump position with knees bent slightly



**3** Dives forward and outward to attain adequate clearance



**7** Canopy is dragged from container by opened pilot chute



**8** Shroud lines slip from pack as canopy shoots skyward



**9** Somersault nears completion as lift webs follow lines



**10**

Parachute's five parts work in perfect co-ordination to complete mission of bringing jumper d

**4** Assumes an almost horizontal attitude for a split second



**5** Pulls rip cord and immediately brings arm back to side



**6** Flaps open & pilot chute is released when cord is pulled



As air fills folds canopy snaps open, checking descent



**11** Slides back in harness sling to realize greater comfort

**12** Grasps lift webs in both hands & pulls down to shoulders



in safely. Nylon's place in fabrication of parachutes has been established by exhaustive testing.



# DID YOU KNOW?

## Flight Advisory Service

### ATC Centers of CAA Function

A flight advisory service is available to pilots of naval aircraft, administered by the airway traffic control centers of the Civil Aeronautics Authority through the Civil Aeronautics Administration, Communication Stations. Pilots are advised of weather conditions, inoperative or malfunctioning radio aids to navigation, and other information on flight safety. Naval pilots are cautioned not to proceed against a danger warning unless urgent military necessity dictates that the warning be disregarded.

## PBY Converted to Transport

### Basic Weight Down to 16,600 Lbs., Payload Up 3,000 Lbs.

NAS, PATUXENT RIVER.—A sample of what can be done in converting seaplanes is shown by the recent visit from Coco Solo to Naval Air Facility, Dinner Key, of a PBY which had been completely converted to a transport.

The cabin was raised to a position flush with the deck bulkheads, which left adequate head room and space for installation of 30 passenger seats, plus 5 for the operating crew. Conventional waist hatches were replaced by cargo hatches 5½ feet square located just aft of the tower on the portside. Basic

weight of the airplane was dropped to 16,600 lbs., increasing payload by more than 3,000 lbs.

## Skin Cream Against Burns

### Covering Lasts 6 to 8 Hours



The Navy has perfected a skin cream which crews can smear on exposed parts of their bodies to protect against flash burns, one of the worst battle hazards.

The cream was tried out on several score officers, enlisted personnel at the Naval Medical Research Institute before being sent out to the fleet for trial under combat conditions. It is battleship

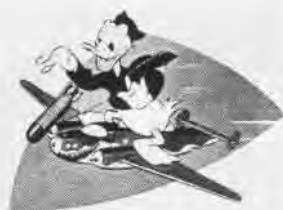
gray and has the consistency of ordinary cold cream.

When applied to exposed body surfaces it dries in five minutes to form a pliable covering effective from six to eight hours. Ordinary clothing is sufficient protection against any but the most intense flash burns. A man may escape fragments from a bursting shell, aerial bomb or torpedo hit only to be frightfully burned by the "flash." In the Navy and Marine Corps, burns rank second only to gunshot and shell fragmentation wounds as a cause of battle casualties incurred.

## Free Gunnery Committee Standardizes Ground Training

NAS, PENSACOLA—In order to standardize free gunnery ground training, an aviation free gunnery central standardization committee has been established with headquarters at Naval Air Training Center, Pensacola. The committee has seven functions:

1. Recommends minimum training standards to be met by student gunners prior to graduation.
2. Assigns to operational training units.
3. Prepares a syllabus to attain these standards.
4. Composes standard textbooks for use with syllabus.
5. Conducts teacher training program for free gunnery instructors.
6. Collects all new ideas and developments on free gunnery.
7. Acts in liaison with Army gunnery program.



## ESCHEW THE DUCK!

NAVAL Aviation is receiving too many designs for squadron insignia that are doing that patient old prototype—Duck—to death. Progeny of the grand-daddy are becoming too numerous, with the result that insignia lack distinction . . . not to mention the great many demands being made on the Hollywood designer. Squadrons forming, therefore, should hire a new model. (Also lay off the Eagle, NANews 9/1/43.)

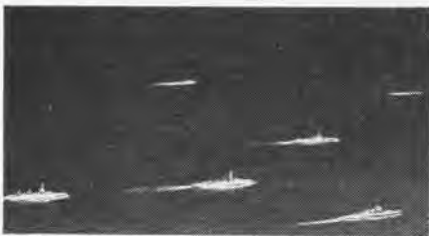


GRAND-DADDY OF ALL DUCKS DES. IN 1931 BY EDDIE COLLINS

## "Photo Fleet" Plenty Real Gives Practice Problems Oomph

NAS, JACKSONVILLE—Model photography has made observation and recognition as near the real thing as possible for student pilots in the VO-VCS operational training unit here. For observation problems, models of enemy ships in disposition are photographed at a scale to create the illusion of altitude; and for recognition work, they are photographed in large groups and projected on a screen to provide a visual exercise that could not be accomplished by clear-cut close up slides and pictures.

As a final phase of his training, each student in the VO-VCS unit makes a



ENEMY FLEET PHOTOS FROM TINY SHIP MODELS

number of advanced operational problem flights, which include a two-hour search problem, bombing and gunnery exercises. During the search problem, the pilot opens a sealed envelope in which the enemy disposition is set forth; and on the basis of this information, he makes out a contact and amplifying report on the spot.

Formerly, the disposition was merely a mimeographed diagram. Now it is a photograph of models of actual enemy ships in formation, realistic even to the wakes. It gives the student pilot a workout pretty much akin to that he would get in actual combat, since he must make out a report on enemy force, course, speed and composition, and be able to recognize classes of ships in the photograph—all while busy flying his plane and keeping on course.

Simplicity in the setup makes it possible to provide a constantly changing set of dispositions and recognition problems in interesting pictorial fashion.



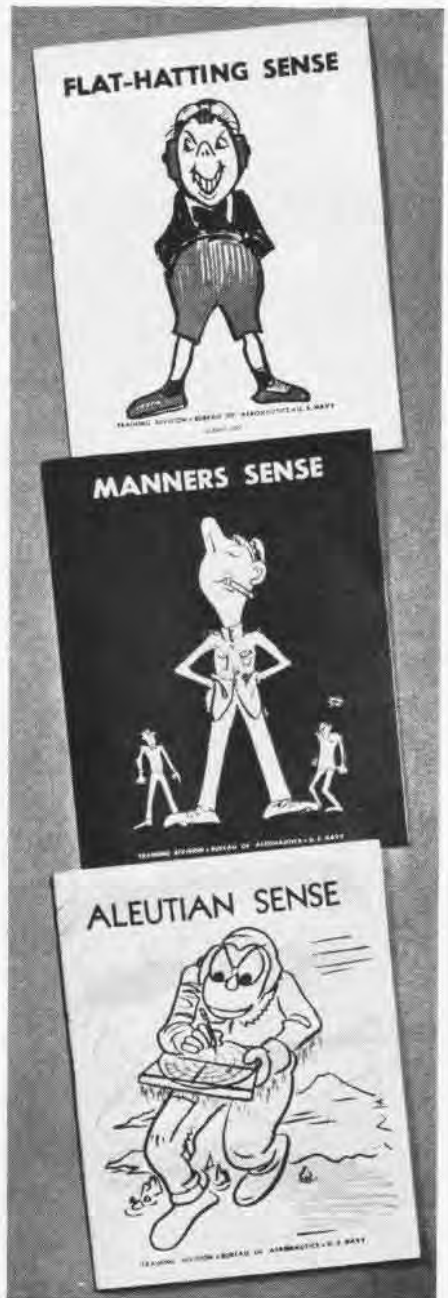
## Three New Sense Pamphlets Style and Treatment Familiar

Added to the list of informative, easy-reading Sense pamphlets are three new issues: *Flat-Hatting Sense*, *Manners Sense*, and *Aleutian Sense*. Published by the Aviation Training Division, the pamphlets are receiving wide distribution through established channels. *Manners Sense* is designed for, and available to naval aviation training activities.

**FLAT-HATTING SENSE**—Flat-Hatting is the Navy's designation for the form of flying that discourages longevity. Seeing cows, farmers, telephone poles, and privies fly by beneath is very satisfying, but it is also very dangerous. The line the author takes here is that Flat-Hatting is a no-good way to fly. "Not only will it get you nowhere, it will get you killed." There are many ways to Flat-Hat, all of them bad. *Flat-Hatting Sense* deals directly with the most poisonous forms.

**MANNERS SENSE**—Student officers may be inclined to think of the subject matter of this document as "old stuff." Answers to this are: 1. "If you think it's 'old stuff,' make a check and see how many violations you see and hear around you. Then turn the mirror on yourself." 2. Treatment of the subject of manners is fresh enough to interest and entertain the most polished officer. "In uniform you're a marked man, and you should become conscious of the civilian viewpoint."

**ALEUTIAN SENSE**—Aleutian weather is unlike that of any other place in the world—plus Williwaws. "In flying Aleutian weather there is no substitute for using your head and for conforming with the rules." *Aleutian Sense* outlines the rules—rules that came about through a lot of difficult and hazardous flying by men assigned to this area that is now synonymous with Peculiar Weather. No one has yet set himself up as an Old Timer in any phase of Aleutian operations.



### USE THIS FORM TO ORDER PAMPHLETS

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

FROM:

(Unit commander)

TO: Office of the Chief of Naval Operations

SUBJECT: Pamphlets—Request for.

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

COPIES

PAMPHLET

Flat-Hatting Sense

Manners Sense (For Training Activities)

Aleutian Sense

SIGNED:

Delivery

Address:

Cut here

# BEST ANSWERS

## IX—Physics

Pick the best choice to complete the statements below, then check your answers on p. 32.

**1. Velocity of recoil of any particular gun on a battleship may be calculated from the—**

- a—bore of gun, weight of shell, and velocity of shell at muzzle
- b—weight of gun, weight of shell, and velocity of shell at muzzle
- c—velocity of shell at muzzle, bore of gun, and length of barrel
- d—weight of gun, length of gun, and velocity of shell at muzzle
- e—weight of gun, weight of shell, and bore of gun

**2. Strength of an electromagnet depends on the number of—**

- a—volts and turns
- b—amperes and turns
- c—volts, turns, and the diameter of the turns
- d—amperes and the diameter of the turns
- e—amperes and the resistance of the wire in the magnet

**3. In an experiment of the force of gravity, an arrow was dropped from the top of the Eiffel Tower (1,000 ft.). Ignoring air friction, the arrow should reach the ground in about—**

- a—6 seconds
- b—62.5 seconds
- c—3.2 seconds
- d—32 seconds
- e—8 seconds

**4. Rate of flow of electric current through a circuit depends on the—**

- a—resistance of circuit and difference in potential
- b—resistance of circuit and power load
- c—difference in potential and power load
- d—resistance of circuit and total energy passed
- e—difference of potential and total energy passed

**5. An artillery sergeant sees his own shell burst on a ridge in the distance and, by stop-watch, hears the explosion 11.5 seconds later. His distance from the bursting shell is about—**

- a—0.9 statute miles
- b—12.75 statute miles
- c—2.2 statute miles
- d—5.9 statute miles
- e—4.6 statute miles

**6. A glider is being towed by an airplane at a velocity of 200 ft. per second. If the strain on the tow rope is 275 lbs., pulling the glider requires—**

- a—100 horsepower
- b—16.6 horsepower
- c—30.25 horsepower
- d—10 horsepower
- e—1,000 horsepower

## Sources of Training Film and Projection Equipment

TRAINING films and projection equipment are now available to operating squadrons from central sources in all areas. Squadrons without machines or films may borrow from these sources:

**CONTINENTAL U.S.—**Joint Aviation Training Film and Equipment Libraries have been established to service all activities aboard at NAS Quonset, San Diego, Alameda, Norfolk, Seattle; MCAS Cherry Point, and MARFAIR West Coast. Sub-libraries have been set up at CASU 23 and 24, and CASU 23 Detachment, Fleet Air, NAC, Fleet Air Wing, and NAS film has been pooled in these central libraries. **ABOARD SHIP**—Projection equipment and a basic library of training films are being assigned to all CV, CVL, and CVE in allowance list.

**OUTSIDE CONTINENTAL U.S.—**Com-Fair South Pacific has assumed custody of training films and projection equipment for all activities in the area. New film releases and equipment are also being serviced to Hedron 4, NAS Sitka, Dutch Harbor, and Kodiak for activities in that area, and NAS Pearl Harbor and MCAS Navy #61 are serviced with film to meet requirements of activities in the area. Hedrons, 3, 7, 11, 12, 15 and 16 are being serviced training film for their areas. In addition, shipments of film are being made to the following NAS: Navy #115, 116, 117, 138, 309, 311, and 1504.

**NAOTC and NAITC**—Squadrons are serviced with training film and equipment through NAOTC training film officer, Jacksonville, and training film officers at NATC Pensacola and Corpus Christi.

**LTA SQUADRONS**—General training films are being shipped to NAS Lakehurst and Sunnyvale for East and West LTA circuits, and specific training films to activities as designated by Naval Airship Training Command.

**IN EASTERN U.S.**—Squadrons in Washington area may secure films from NAS Anacostia or from BuAer Training Film Branch; in New York from NAS New York.

*Spare parts for projectors, lamps, bulbs, etc., may be secured by directing an official request to: Commandant of the Navy Yard, New York, or Mare Island, California; portable motion picture screens: Supply Officer in Command, Naval Supply Depot, Mechanicsburg, Penna., or Naval Supply Depot, Oakland, California.*

obtain copies by request to the Office of the Chief of Naval Operations, Aerological Section. Requests should be made by letter or indicated under "Remarks" on the Monthly Aerological Inventory, Form N.Aer. 446(a). The Aerological Section wishes to receive sample copies of publications in this field that may not have come to its attention.

*A Practical Analysis of Weather Along the East Coast of South America.—P.A.A. report*  
*Weather in the Indian Ocean, Vol. 3, Part 1.—British Admiralty*  
*Hurricanes of the South Pacific. Navy (Confidential)*

*Synoptic Analysis Over the Southern Oceans. Navy reprint of a New Zealand report*

*Offshore Winds Along the West Coast of the United States. Navy*

*Weather Guide for Long Range Planning—Milan, Italy. U. S. Weather Bureau*

*Weather Guide for Long Range Planning—Budapest, Hungary. U. S. Weather Bureau*

*Weather Analysis in the Tropical South Pacific, Series A, Number 1, U. S. Navy reprint of New Zealand publication*

*Weather Guide for Long Range Planning—Genoa, Italy. U. S. Weather Bureau*

*A Series of Papers on the Weather of South America. Navy reprint of P.A.A. report*

*Meteorological Data for Japan. H. O. Misc. No. 10,638*

*Winds at High Levels Relative to the Fronts and Occlusions of Typical Depressions. Admiralty*

*Advance Release: Weather Guide for Long Range Planning—Marseilles, France (July to December). Weather Bureau*

*Atlas Lee—Depressions and Their Significance for Scirocco. Navy reprint of British Synoptic Divisions Technical Memo. No. 43*

*Climate and Weather of Southeastern Asia, Part I. India, Burma, and Southern China, Vol. V-3. Army*

*Synoptic Analysis in the Tropical Pacific. Navy reprint of a P.A.A. report*

*Sea and Swell Charts North Pacific. (H.O.)*  
*Sea and Swell Charts Northwest Pacific. (H.O.)*

*Sea Surface Temperature Charts for Western Pacific—Jan—Dec.*

*Weather Guide for Long Range Planning—Jaluit, Marshall Is. U. S. Weather Bureau*

*Incendiary Bombing of Japan*  
*Incendiary Bombing of Germany*

*World Sea Surface Conditions. (Atlas of Wind and Swell Charts) H.S. 1289/41 (4181 through Y 192)*

*U. S. Navy Reprint, Wind and Weather Currents, Tides and Tidal Streams in the East Indian Archipelago, published in Batavia, November 1896, by J. P. Van Der Stok, Ph.D.*

## Aerological Publications Lists Appear in NANews

HEREAFTER, and from time to time, the Aerological Section will publish in NANews a listing of aerological and climatological publications available to naval air activities. Initial distribution will be made to units that have logical need for them, and others may





# QUONSET'S "EAGER BEAVERS"

## Tough, Taut and Thorough Is the Indoctrination That Prepares Officers for Many Billets in Naval Aviation

QUONSET graduated officers are becoming, in a manner of speaking, ubiquitous. Wherever Navy sails and Navy planes fly, there will be found officers specially trained at the Rhode Island naval training school (indoctrination) to fill billets as varied as the

many specialized functions of naval aviation today. These include fighter director, aerology, air combat information, special devices, naval air transport. . . . When through with their Quonset courses and drill, officers go out to duty aboard carriers or at shore establishments.

Quonset officer training admittedly is no cinch. Indoctrinees speak of it as being tough, taut and thorough. Preparation for the rigors of future Navy routine leaves the trainees a modicum of

time off. From 0600 to 2215 the "eager beavers" are to be found pursuing the three R's, which to them are classes, athletics and drills.

Emphasis is on the aviation branch of the Navy and, conveniently, Quonset men have direct contact with planes and the men who fly them at the naval air station, a stone's throw away. The commanding officer at the Naval Air Station inspects the personnel of NTS(I) and also reviews their battalion parade.



SEAMANSHIP ROOM IS MUSEUM OF STRANGE GADGETS TO BE MASTERED



FOR MANY INLANDERS, BOAT DRILL GIVES 'FIRST TANG OF BRINY SEA



CLASSES, ATHLETICS, DRILL MARK THREE DIVISIONS OF CURRICULUM FOR QUONSET OFFICERS GETTING FAMILIAR WITH ESSENTIALS OF NAVAL LEADERSHIP

# Pilot's Day on a Carrier



**PRE-DAWN** call rouses the naval aviator out of his equipment-strung bunk aboard carrier

AIRCRAFT carriers are helping the United States Navy rule the seven seas today, with their swarms of fighting planes chasing Japanese destroyers, cruisers and transport ships to cover, and new and converted carriers aiding in neutralizing the U-boat menace. The life of a naval aviator aboard one of these flat-tops is not limited to combat flying—he lives the same kind of a life, in many ways, as his fellow officers ashore. He gets up early, has his java and his bull sessions, mixed with study and preparations for action. On these pages NANews shows a few picked scenes from the life of a navy flier aboard Carrier X.



**AIR OFFICER** aboard Carrier X instructs men in navigation and other problems of the day—




**JAMOKE**—a quick cup with his mates in ready room—prepares aviator for patrol over ocean




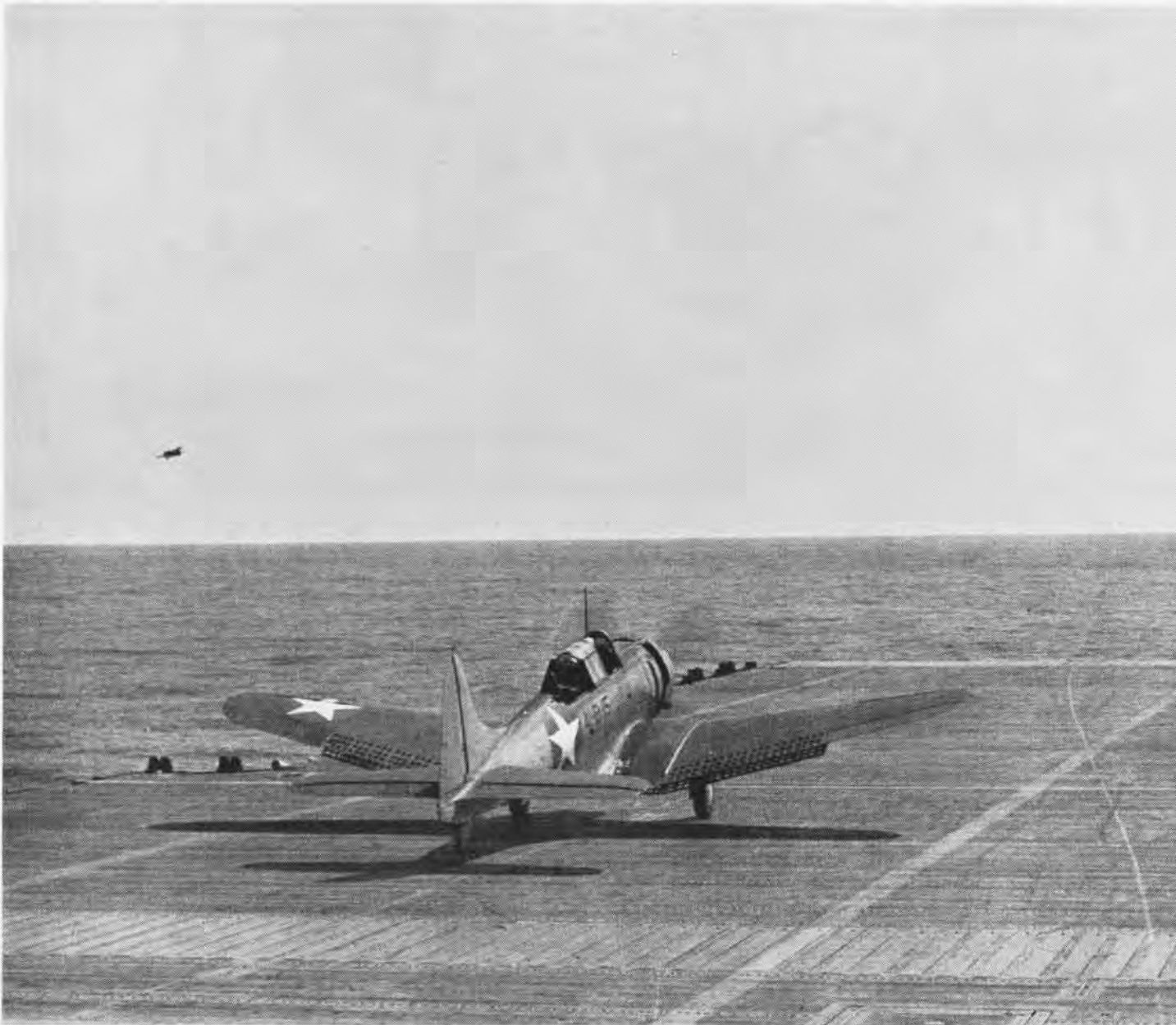
**PLOTTING BOARD** before him, aviator works up navigation data prior to manning plane




 **CHECKING** plane before takeoff, captain aids pilot adjust his harness and headphone set



 **RADIO MAN**, who doubles as rear gunner, goes over his .30 calibre guns before taking off



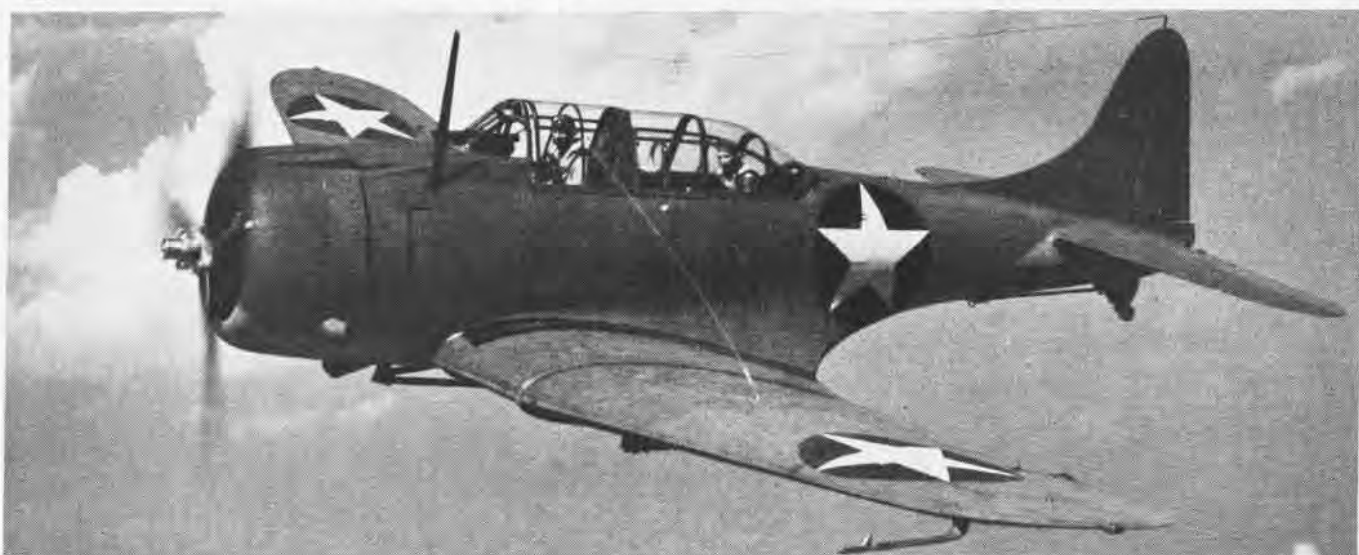
 **SCOUT BOMBER** roars down the deck of Carrier X to keep its rendezvous overhead with squadron

leader and other ships; once assembled they head off to patrol vast ocean areas for enemy subs menacing convoy





**DESTROYERS** criss-cross in front of carrier as her aircraft assemble overhead for mission to hunt down U-boats; ship's crew line rails to watch as they leave; Carrier X has plenty of AA guns in neat rows





**TRIM SBD'S** such as these help U. S. Navy crack stranglehold U-boats had on allied shipping; in this picture they are ready to pair off and start search for subs surfacing to recharge batteries or seek quarry



**CONTACT** with surfaced sub established, SBD's pilot makes strafing run, peppering it to keep submarine's crew from coming topside to man deck guns and chase off planes before bombs can be dropped on it



 **SIGNALMAN** gives cut to plane, returning after sinking sub

 **WARDROOM** card game aids men to relax from day's patrols

### ETERNAL VIGILANCE

Carrier duty—the goal of most naval aviators—often may get monotonous in the long patrols which the ships must make, especially when no submarines are flushed and sunk, but eternal vigilance is the price of staying afloat these days. America's growing carrier strength, together with her expanding ground bases in the Pacific, helps keep the Jap fleet significantly out of sight.





# MARINE CORPS

## Marine Aviators Try Hand at Sailing

CHERRY POINT.—They may be aviators first, but Marines at this station also will get a chance to see how they like being sailors.

Fifteen sailboats and fifteen rowboats have been secured for use of the personnel for recreation purposes. An area in the Neuse River has been set aside as a sailing zone for embryo Thomas Liptons. Novice, intermediate and expert permits are issued after tests, to help insure against accidents.

## Group 43 Builds Swimming Pool

EL CENTRO.—Group 43, in order to comply with orders on training from a higher echelon, have built a swimming pool—or should we say hole? This refreshing spot in the midst of the American Sahara is known as Gabler's Gulch, named after the genius who conceived the idea of a swimming hole in a desert without trees, blondes, or soft drinks. The group has been operating in temperatures up to 125°, and the new pool comes in very handy—even without the blondes.

## Perfect New Gunnery Sleeve

CHERRY POINT.—A Marine night fighter squadron at this station has developed a new gunnery sleeve to enable a fixed gunnery run for a non-deflection shot.

The sleeve is designed to fly at 45° angle and at a lower altitude than the towplane. To achieve this the top half of a regular tow sleeve is cut in half.

This is split open and a third of its circumference is replaced with wire mesh obtained from an anti-aircraft banner target. The mesh is sewn to the regular canvas sleeve and tapers in proportion at the tail.

A heavy weight is placed in the nose so that the mesh faces inboard. This offers less resistance and forces the sleeve to the side of the towplane.

## Form to Ease Recording of Flights

CHERRY POINT.—With the great increase in operations at this station—nearly 900 flights daily—it was necessary to devise a standard system for submitting daily flight schedules.

The schedules are necessary so operations could handle traffic and notifications of flights given to the Army Interceptor Command, Wilmington, N. C., and Air Traffic Control, Washington, D. C.

Forms were made up by operations department in pads of 100 each with one-time carbon between each sheet. During a recent month, operations averaged 900 flights daily from the main station. Outlying fields averaged about 500 operations. Peak so far was 1,012 operations at Cherry Point and 613 at the five outlying fields.

## How to Handle Training Literature

CHERRY POINT.—The Intelligence Section has devised a simple system for keeping before the lower echelons an accurate picture of the great mass of training literature and other material received from many sources.

Each piece of material is catalog indexed by key letter designations. Each group is furnished an exact duplicate of this master index card. In turn the group furnishes duplicate cards to its squadrons.

On the card appears: title of publication, catalog designation, subject, originator and issuing office, date of issue and date of receipt, number of copies received and distribution made.

Each piece is also cross-indexed and mimeographed stencils cut and sent around to all intelligence officers. Monthly digests of selected articles are published, like a movie trailer or book review, to arouse the curiosity of the reader.

## Procedure in Shipping Spark Plugs

CHERRY POINT.—Discarded machine gun ammunition boxes and a bag of dehydrating crystals are used to help keep mica spark plugs dry while being shipped.

A fighter squadron engineering department took metal liners out of .50 caliber boxes, cleaned and straightened them, then put on a new top. Plugs removed from the cabinet were put in the boxes while still hot, crystals added and the lid soldered on tight.

## Avoiding Food Congestion in Flight

CHERRY POINT.—A light meal of freshly prepared food before night flying, with a supplementary meal upon return, is suggested by the flight surgeon to eliminate altitude food congestion and improve night vision.

Food that is to be carried aboard the plane for consumption en route should be prepared at the last minute before take-off. It should be of the most freshly cooked foodstuffs available. Food spoils rapidly in flight in warm weather.

Digestion of slightly spoiled food at altitude conditions is ineffective and may cause violent illness of a severe nature upon returning to sea level.



IF YOU can translate this you may consider yourself a charter member of the Old Salts: "All hands lay aft abaft the after taff rail to haul taut the after-gaffer."



# TECHNICALLY SPEAKING

## A Red-Lensed Night Goggle Pre-Adapts Vision to Darkness



AIDS NIGHT VISION

Most helpful of new aids that reduce time required for adapting vision to darkness is a close fitting red-lensed goggle which the wearer uses one-half hour before entering darkness.

The new development is described in the amended version of Technical Note 30-42, *Notes on Night Vision*.

The new goggle enables flight crews to remain in a brightly lighted room while becoming pre-adapted for night activities. Wearers are unable, however, to discern red lines on maps or charts. The dark adaptor goggles are on allowance lists for all ships and stations under stock number 37-G-3530. All requisitions should be directed to Aviation Supply Office, Naval Aviation Supply Depot, Philadelphia, Penna.

T.N. 30-42, as amended, also presents "Ten Commandments of Night Vision":

1. Do not attempt night duties until dark adapted—avoid short cuts.
2. *Maintain* maximum dark adaptation by avoiding all possible light; practice blindfold drills until all surroundings are known by touch.
3. For instrument lighting use dim light, preferably red; do not stare longer than necessary at lighted instruments.
4. Keep windshield and goggles spotless and unscratched.
5. Practice use of corners of the eyes; night targets are better seen by not looking directly at them.
6. Move the eyes frequently; practice systematic scanning; be alert for moving objects.
7. Know the tactical value of low light contrast in night missions.

CALLING ALL SQUADRON COMMANDERS

Does EACH PILOT  
Check PLANE GEAR  
Before EACH FLIGHT



8. Use night binoculars when available.
9. Observe technical orders in use of oxygen; be over-conscious at night, not over-confident.
10. Don't break training—stakes are too high.

## Better PBY Exhaust Unit Three Air Changes per Minute

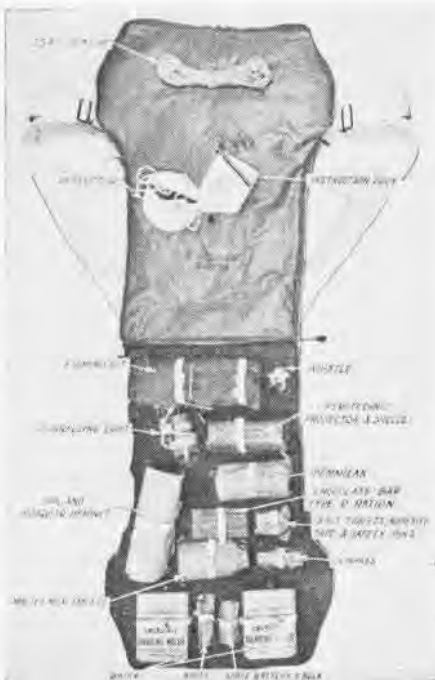
NAS, PENSACOLA—An exhaust unit to ventilate PBY center wing section fuel tanks while repairs are being made has been developed at the A&R Department here.

Previous devices employed canvas ducts to supply air to the tank, but the improved unit provides a means to secure intake opening of blower directly to open fuel dump valve in tank, eliminating flexible ducts which might kink

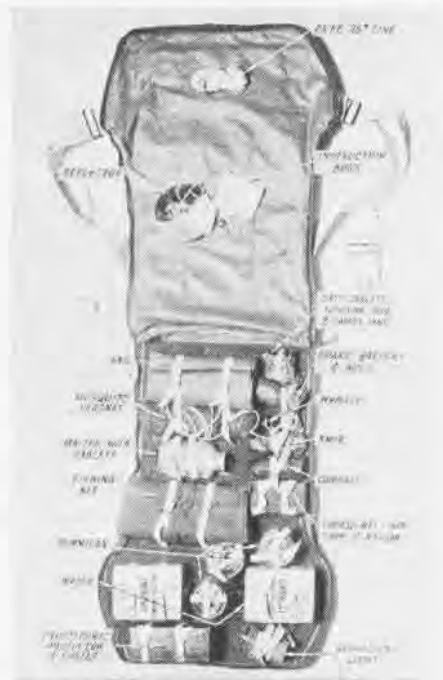
or pinch. Blower employed gives at least three complete air changes per minute in tank. Drawings of the unit are available at the A&R's Plant Section.

## Tow Target Like Pennant It Compares With Plane in Size

MCAS, EL TORO.—Fighter pilots are utilizing a pennant-type tow target for high-speed gunnery practice. The target is a single sheet of white wire cloth and can be towed in either horizontal or vertical position. It presents an area comparable to the size of an airplane, in place of the usual 18-in. high-speed tow target. An adjustable feature of target permits making all normal runs for gunnery practice at high speed.



OLD BACK PAD KIT PROVED BULKY AND THICK



NEW UNIT IS THIN, COMFORTABLE TO WEARER

## Back Pad Kit Modification Thinner, It Increases Comfort

Reports from service indicate the need for reducing thickness and increasing flexibility of the back pad kits delivered under contract N288s-10870. BuAer is making available to the supply points (contract N288s-17021) sets of materials, with instructions and diagrams

necessary to reduce the thickness and increase the comfort of these kits. Each modification set consists of:

- a—One 1/2" synthetic sponge rubber pad, replacing present kapok pad in kit.
- b—One 1/4" felt pad complete with tapes and snap fasteners located to rearrange equipment items for more comfort. Replaces present 3/4" felt pad.
- c—Instructions and diagrams.

## Tool for Fabric Strips Norfolk Civilian Wins Award

NAS, NORFOLK—A civilian employe at this station has designed a tool for bending fabric retainer strips to contour which makes a 90 percent time saving over hand methods and eliminates buckling of the metal.

The tool consists of two metal plates separated at a predetermined distance and cut on one end to a definite radius.



THIS INVENTION WON WORKER A CASH PRIZE

Two steel straps with a roller are bolted between them to roll on the curved ends of the plates, and a metal bridge is installed across the ends of the plates. By pushing the roller down the curved surface the strip is forced between the plates and bent edgewise.

[DESIGNED BY ARTHUR E. BISHOP, NAS, NORFOLK]

## For Refraction Corrections Applied to Observation Thru the Navigation Dome

Several inquiries have been received as to refraction corrections to be applied when sextant observations are made through navigation domes, FSSC No. 88-D-200.

Corrections appear on a small card cemented to dome near its mounting flange, visible from inside dome. Heading on correction card is Ver. Dev. Minutes of Arc. (Ver. Dev.—vertical deviation.) On card, correction in minutes of arc to be applied to observed altitude due to vertical deviation or refraction of dome, is given at 10° altitude intervals for altitudes between 20° and 80°. Proper algebraic signs are prefixed to corrections.

These corrections apply to sights made in such a way that index prism is at a point approximately 6 inches below and 3 inches forward of apex of dome, or in such a way that line of sight passes through that point. Correction remains constant as line of sight, sextant suspension, and sextant are rotated together in azimuth.

The AN5851 (Pioneer-Mark 5)

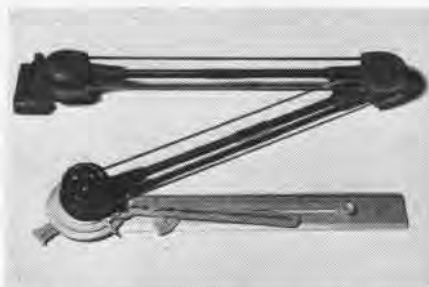
(FSSC 88-S-350) sextant and the British Mark 9-A sextant (FSSC 88-S-355) are designed to be suspended from an arm at apex of navigation dome. A third type sextant for use in dome is now being manufactured, delivery being expected in January 1944. It is designated AN-5854-1 (FSSC 88-S-375).

All the above sextants, when suspended in the dome, locate index prism at the correct position for which the dome has been calibrated.

## Vector Plotting Machine Seven Variables Can Be Used

A new type drafting machine, designated as vector plotting machine, has been developed and is now being produced by BuAer.

This instrument, FSSC No. 88-M-58 (AN-5748), is interchangeable with the existing model, FSSC No. 88-M-50, as to size and function, except that the vector plotting machine will solve vector triangles when certain information is set into it.



NEW MACHINE CAUSES NO COMPASS DEVIATION

There are seven variables on the head and rule of the machine which can be used in plotting a course. These are wind velocity, wind direction, ground speed, track, true airspeed, heading, and drift angle. If any four known values are set into the vector plotting machine it is possible to obtain the other three simultaneously.

For example, if the wind velocity, wind direction, track, and true airspeed are known, it is possible to find heading, ground speed and drift angle. These figures are obtained directly in units per hour. With this vector plotting machine it is also possible to change one of the known factors without changing the setting of the others.

The machine is made of non-magnetic material and therefore can be used on the navigator's table without causing any deviation in operation of the navigator's magnetic compass.

## Plane's Record on Card Idea Speeds Up A&R Production

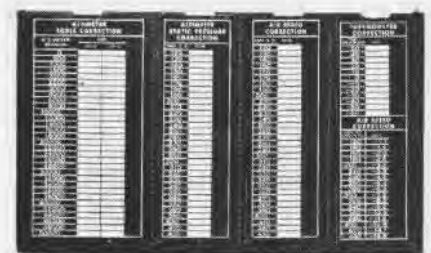
It was only natural for workers in the A&R shops at NAS, Norfolk to wonder about some of the planes which rolled down the assembly line—where they had been and what they had done. Station officials have taken care of this. Now, every plane coming into the shops, which has seen enough action or has some interesting background meriting special attention, carries a placard briefly summarizing its fighting history. Without revealing any military secrets, the labels satisfy normal curiosity, give the plane an identity of its own, and attract special attention which it might not get otherwise. A&R officials believe this factor is one of the reasons why production in these shops is at its highest peak.

## Instrument Calibration Cards Are Convenient Source

BuAer has initiated procurement of 5,000 each of the following instrument correction cards:

- FSSC No. For Correction of
- 88-C-154 Indicated airspeed
- 88-C-179 Altimeter scale
- 88-C-192 Altimeter Static pressure
- 88-C-224 Free Air Temperature Thermometer

The four cards are an adaptation of those furnished for bombardier use by Army Air Forces, described in T.O. No. 05-30-1. All four cards bear fluorescent markings. Navy versions carry printed instructions on backs, are



CARDS HELP BOMBARDIER FIGURE ANGLES

printed in terms of knots rather than miles, and carry an FSSC number. The four cards are designed for use with the multiple card holder, FSSC No. 88-H-510. Combination of four cards in one holder affords a convenient source of calibration information for bombardiers.

Operating activities desiring cards and holders may secure them from Supply Officer, Naval Aircraft Factory, Philadelphia. BuAer invites comment from activities on their value for installation as standard equipment in future airplanes.

# LATEST BACK PAD KIT



**1** Convenient strap-on kit for air crew designed to supply essentials of life

**2** Everything from emergency rations to sunburn ointment enclosed in compact unit for airmen forced to bail out



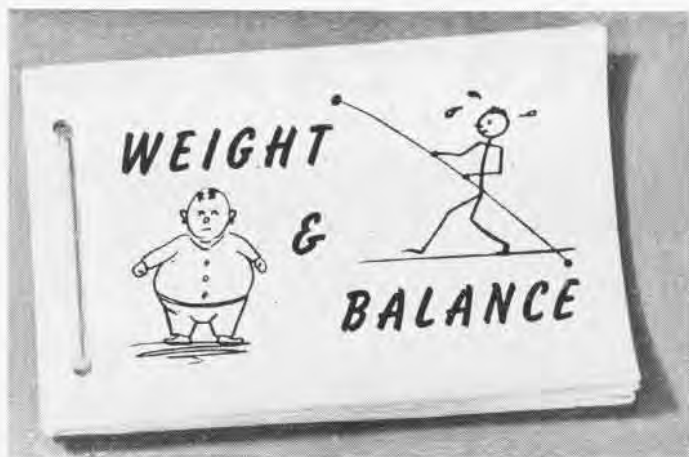
**3** Pockets of zipper case hold equipment needed on life raft or jungle island

**B**UAER has made available to all supply points the latest type of back pad kits, under Contract Noa(S)-1409 and Noa(S)-1549. Kits are designed primarily for use with parachute type life raft, and sufficient gear is provided to sustain life whether landings are made in the jungle or on water. Contents of the kit were based upon service recommendations:

Two cans of water . Three cans of rations . Hand projector and Very's shells . 75-pound-test cotton line . Knife . Compass and Matches . Fishing Kit . Combination Poncho-Raft Cover . Signaling Mirror . Mosquito head net . Whistle . First Aid Kit . Instruction Booklet . Jungle Utility Knife . Adhesive Tape . Salt Tablets and Safety Pins . Sunburn Ointment . Canvas Gloves . Sharpening Stone . Can of Oil . Magnifying Lens.

It is realized that in some cases insufficient space is available in the rear seat of some VSB, VTB, VOS and VSO classes of airplanes for installation of back pad kit. Accordingly it will be necessary for each activity to modify this equipment to permit its use in these locations. BuAer is approaching this problem by investigating the possibility of stowing equipment now provided in back pad in a modified parachute raft case, and placing a minimum of equipment in kit to reduce its thickness.





READ DOWN ▼

IT IS down-to-earth in its presentation—that booklet at the left—and it tells a convincing story of the woe that is in store for those who ignore Nature's laws of weight and balance when loading a PV-1. It is an earnest attempt of an operational training squadron to make its loading crews conscious of the center of gravity in a plane. WEIGHT and BALANCE CONTROL have busied BuAer and Army experts for some time, and more is to be heard on this subject. Below, NANEWS presents the pamphlet in film-strip continuity form.

**WEIGHT** & **BALANCE**

1. KNOW WHERE THE CENTER OF GRAVITY OF YOUR AIRPLANE IS:

2. AND KNOW WHICH WAY AND HOW FAR IT IS LIKELY TO GO AS YOU INCREASE OR LIGHTEN YOUR LOAD— OR SHIFT IT

WHEN THE PV IS EMPTY IT TENDS TO DO THIS:

WHICH EXPLAINS THE CONCRETE IN THE TAIL STANDS

EVER NOTICE IT?

IN SPITE OF ITS INHERENT NOSE-HEAVINESS

MUCH MORE SERIOUS ACCIDENTS HAVE OCCURRED AS A RESULT OF—

IF A PV IS TAIL HEAVY, IT IS NOT THE FAULT OF THE PLANE. IT IS THE FAULT OF THE DILBERT WHO IS RESPONSIBLE FOR THIS →

REMEMBER— THESE FEW SIMPLE RULES

1 FOR BOUNCE DRILL YOU NEED ABOUT 500 POUNDS OF BALLAST—BACK BY THE TUNNEL GUNS

(THIS IS ABOUT 500 POUNDS OF WASHED GRAVEL)

2 IF YOU CARRY 4 OR 5 AIRCREWMEN IN ADDITION TO THE BALLAST— DON'T PERMIT THIS →

OR YOU WILL FIND YOURSELF PUSHING UP DAISIES

3. IF YOU ARE CARRYING ANY AMOUNT OF EXCESS GEAR—LOAD IT WELL FORWARD IN THE CABIN— IT STANDS TO REASON:

REMEMBER— THESE FEW SIMPLE RULES

OR DOES THIS MAKE MORE SENSE?

THE AIRPLANE IS SUPPORTED BY ITS WINGS

SO:

WHAT IN HELL CAN YOU EXPECT?

IT'S UP TO YOU

USE YOUR HEAD

OR

LOSE IT!

END

WORTH THINKING ABOUT— ISN'T IT?

STORY ADAPTED FROM THE PLAY OF THE SAME NAME SCENARIO AND TITLES, CORNY AS THEY ARE, BY R. E. HOWE, LT., USNR N. A. S. SANFORD, FLA.

# Emergency Rescue Equipment

## Signaling Mirror — Signaling Light



### LIAISON COMMITTEE ON EMERGENCY RESCUE EQUIPMENT

To coordinate and disseminate data on development of emergency rescue equipment by Army, Navy, Coast Guard and Maritime Commission, the Joint U. S. Chiefs of Staff established the LIAISON COMMITTEE ON EMERGENCY RESCUE EQUIPMENT. It is composed of representatives of each service with technical personnel under the direction of the Navy's Coordinator of Research and Development. The COMMITTEE suggests items of emergency equipment for consideration by each of the services.



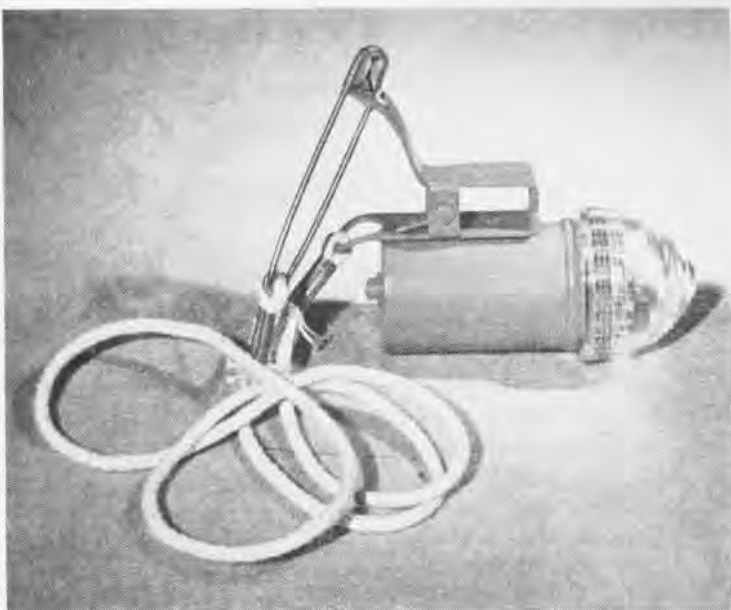
▲ CAN BE SEEN FROM TEN MILES; ▼ RECOMMENDED FOR EMERGENCY KITS



THE Committee's Bulletin No. 1 (June 5) recommends employment of colorless lenses in all life preserver lights, and use of tempered glass type signaling mirrors in lieu of chromium plated metal reflectors. The life preserver light was described on page 49 of the March 15 issue of NAVAL AVIATION NEWS (then BUAER NEWS). An experimental quantity procured under Navy Aeronautical Specification M-567 was distributed to central supply points. These lights are all equipped with colorless lenses.

Before issuance of the Committee's Bulletin No. 1, BuAer had approved the tempered glass signaling mirror. Tests by service activities indicated that sighting features were sufficiently accurate to make reflections visible from points ten miles away. Accordingly, Navy Aeronautical Specification M-580 covering tempered glass type of signaling mirror was prepared. It is being specified for parachute back pad kits and aircraft shipwreck kits now in course of procurement.

Back pad kits are described on page 29 of this issue, and aircraft shipwreck kits were illustrated on inside back cover of September 1 issue of NANews. BuAer will appreciate comments on the effectiveness of this equipment under conditions of emergency use.



JOINT ARMY-NAVY BOARD PUTS COLORLESS LENSES IN LIFE PRESERVER LIGHT



# LETTERS

SIRS:

Aerial photographers based at this station got a taste of the rugged life in a series of field trips during which they learned to cooperate with planes in simulated combat conditions.

Three groups went out for a week at a time. They set up their portable equipment in a remote section on windward Oahu Is-



land, established contact with reconnaissance planes by laying strips of bed sheets in an open space, then quickly developed and rushed to command headquarters photos dropped from planes by parachute.

Such trips have been made a regular undertaking for photographers at this advanced base.

STAFF SERGEANT, USMCR  
MCAS, Ewa, T.H.

SIRS:

We should like to have full information concerning Technical Observer Flight Orders authorized by Executive Order 9195 dated July 7, 1942. Also the type of insignia authorized for Navy officers for this type of flight duty and how the insignia should be worn.

LIEUT., USNR  
Office of INA, Vega Aircraft Corp.  
Burbank, Calif.

¶ The object of the Technical Observer designation is to establish a higher pay basis to compensate for added personal risk. No insignia has been authorized for Technical Observers. These designations are not granted to more than a fraction of the number of Naval officers who, as non-pilots, engage in aerial flights in connection with their duties. Mere travel, however frequent, should have no connection with issuance of flight orders.

Use of the phrase *Technical Observer* in an officer's orders is determined by the concurrent judgment of BuPers and Aviation Personnel Division (DCNO). Certain technical specialists, such as aerial navigators, aerial bombers,

radio technicians, are assigned duties where performance cannot be dissociated from actual flights in aircraft. Under some circumstances, the presence in aircraft of certain non-pilot technicians during periods of flight is required to achieve maximum technical or operational performance. Also, some Technical Observer orders are issued during periods of technical instruction.

It follows that in only certain billets will Technical Observer orders be appropriate. Upon cessation of duties which require flights, the officer is detached by BuPers from flying as a Technical Observer, and always upon change of duty the flight orders do not follow the officer but cease upon detachment from the billet where they existed. Flight orders for Technical Observers must be specifically re-stated as applying to the new billet in the new duty station if officer is to continue same type of work and continue to receive flight pay. Pay for Technical Observers has been set at \$60 per month.

SIRS:

Rather than move a telephone during recent alterations at the Senior B.O.Q. here, the ingenious scheme shown in the picture was contrived. It will be noted that the telephone, ordinarily located in the B.O.Q. office, now reposes on the lap of a "step-laddered" mess attendant from whose cryptic smile can be detected that old sophism, "There's more than one way to skin a cat."

ASST. COMMUNICATION OFFICER  
NAS, Lake City

SIRS:

To make restricted and confidential publications more readily accessible to flight instructors during their free periods, the material has been removed from Communications to a safe in the Squadron Personnel Office. There are about 50 publications containing information of especial interest to Naval aviators on such subjects as airport facility directions, navigation, anti-submarine warfare, recognition, and combat area intelligence reports. A log is kept of the time each publication is taken out and returned, but none may be kept longer than one day.

COMMANDING OFFICER  
NAS, Livermore

# TOKYO TALKS

Tokyo employs radio liberally to propagandize at home and in foreign countries. Broadcasts in various languages are picked up by monitors all over the world and made available to NANews under the classification RESTRICTED. A number of these are reported below without interpretive comment.

—TO SOUTHERN EUROPE

"Crafty Anglo-American propagandists" have been attempting to tamper with the neutrality of Spain, Portugal, Turkey, and other countries. Japanese radio admits that these "attempts" have been partially successful, branding the Allies as "war mongers."

—TO ASIA

"It would be poor generalship for the Japanese to fight on ground that is right on the fringe of the enemy's powerful bases in Alaska and Australia. The better strategy is to bring the enemy closer to Japan's main bases. Despite the possible loss of their foothold in the Solomons and even New Guinea, the Japanese are not worried."

—TO NORTH AMERICA

"The U. S. forces in the Solomons and New Guinea have completely fallen prey to the Japanese strategy, and they are now in a position to meet with imminent annihilation, as the Japanese have clinched their iron grip on them. Allied supply lines now are extended to the maximum limit, and our forces are giving them a terrific pounding. Unless the U. S. shifts its main counter-offensive elsewhere, the enemy's position in the South Pacific will become definitely ir-retrievable."

—TO AUSTRALIA

Japan makes claims of successful raids on Allied bases in the South Pacific, and speaks of "growing friction between U. S. and Australian troops," declaring that the Australians are made to bear the brunt of the fighting. Allied scouting operations, according to Tokyo, are being neglected, so that landing parties suffer "serious blows" at the hands of the Japanese Air Force. Reinforcements are not forthcoming, "to the utmost disgust of all the Aussies."

—TO THE U.S.

The U.S. is fighting Japan with a "series of pecks and nibbles," and must "soon realize the futility of a nibbling war."

—TO LATIN AMERICA

The Japanese people have been told that they must bear "all kinds of difficulties" in order to "overcome" the "enemy's main strength, but now, if ever, is the time to crush the last determination of America and Britain. America is frantic in her heavy reliance upon material strength, but the Japanese have spiritual strength" which will bring victory over the enemy.

## ANSWERS TO ARMAMENT QUIZ

on opposite page

1. b 2. b 3. e 4. a 5. c 6. a

Visual quizzer films are available from BuAer's Special Devices Division, standard film versions from Training Films.

## BEST ANSWERS

To questions on page 20

1. b 2. b 3. e 4. a 5. c 6. a





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