NAVAL AVIATION NEWS

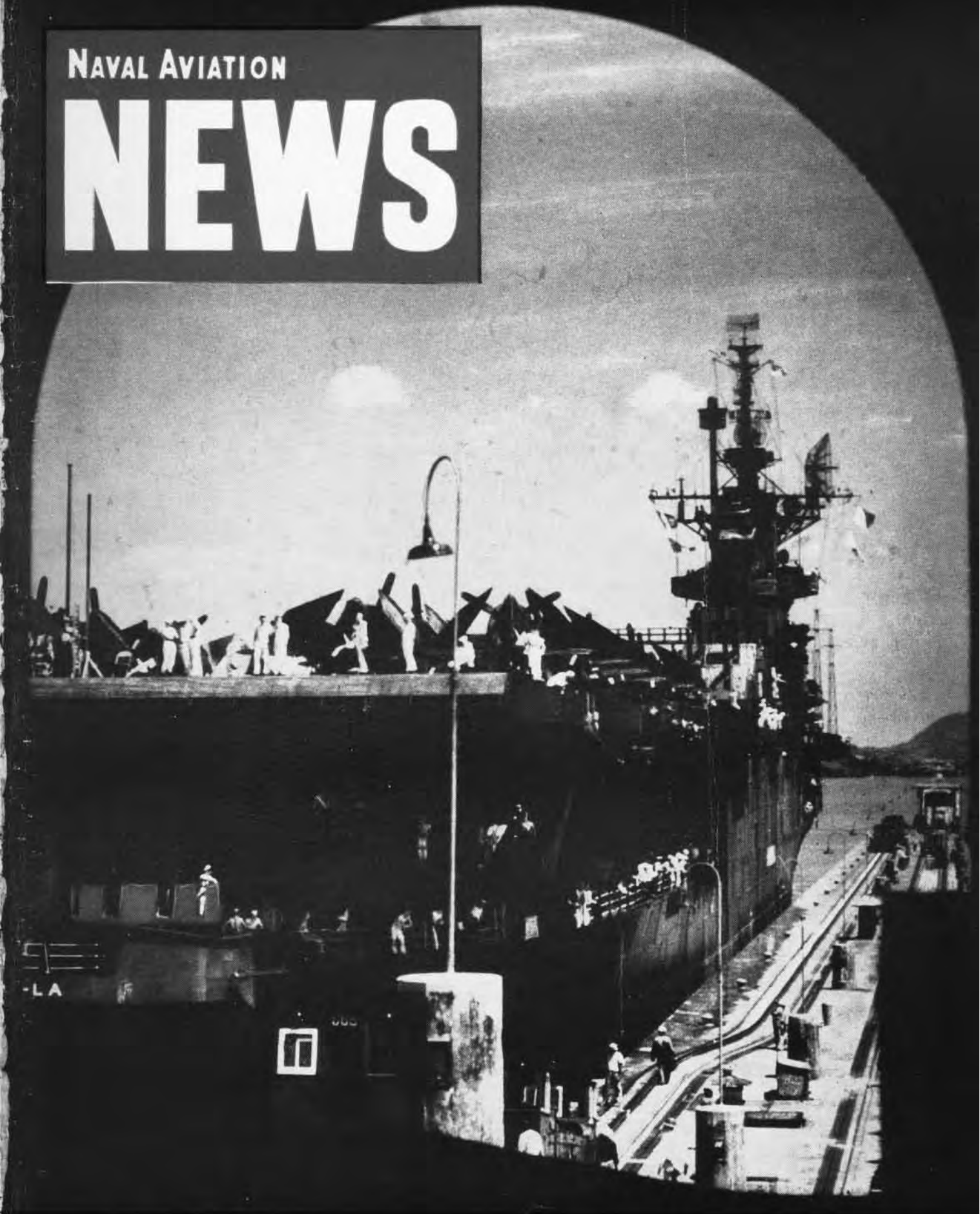


Photo Intelligence
Aeronautical Board
BuAer Builds Budget

May, 1947

RESTRICTED

NORTH OR SOUTH? Most Naval aviators have flown in and out of both these air stations. They are two of the East Coast's largest. One's in New England the other in Florida. Ans. on pg. 40.

PHOTO INTERPRETATION ADDS UP

One of the big disadvantages of any war is that people often get shot at. Getting shot at has never been considered humorous; but getting shot at and not being able to shoot back is particularly unfunny. Ask any of the lads who flew photographic missions over Germany and Japan. Flying down gun muzzles just to take pictures seemed a little silly to some of the boys. And not a few figured that photographic missions were just another method the Gold Braid dreamed up to speed promotions, and make life dangerous.

Photographic Interpretation, of course, claimed it was all worthwhile. They took a few handsful of film and forecast enemy shipping movements, made up target charts and figured out the safest route through flak areas. Photographic Interpretation also calmly reported the exact number of guns the "It-aint-ese" lighthouse manned and reported precise figures on the size hole a certain five hundred pounder made in the deck of a particular jap BB . . . And some of the fly boys accepted all of this information with just the least bit of salt.

Let's check up and see how right the boys who claimed to "know" were. The U. S. Strategic Bombing Survey conducted an evaluation of all phases of aerial attack, including photo interpretation. Their findings were based on a comparison of PI reports, charts, etc, with the actual situation that existed as verified by the Japanese after the war was over. Because, if you want to know the truth, just ask the guy who was there.

PHOTOGRAPHIC INTERPRETERS HAD NO TROUBLE IN IDENTIFYING OUTLINE OF THIS AIRCRAFT RAMP DONE IN RAZZLE DAZZLE

Shipping, Damage Assessing and Airfields Were All Just Part of the Day's Work to PI

PHOTO INTERPRETATION teams made up charts of shipping, airfield location, position of electronics installations, gun emplacements, and damage assessment, during the war. USSBS gives a clear picture of the accuracy of these reports, and in their recommendations and conclusions, some of the lessons of the last war are brought forth.

The problems discussed herein are confined to the Pacific theatre, and more specifically to the Japanese homeland.

First, let us analyze Japanese shipping. Shipping was of particular interest to the Navy and Navy reports were the chief source of information on that subject. In March of 1945, Kure harbor got considerable attention from our carrier units. Pilots came back from a trip over Kure and reported "dozens" of ships in the harbor. Photo intelligence was more explicit in their reports. They stated that on 18/19 March, 1945, the following ships were in Kure harbor:

"One BB–*Yamato;* One BB–*Kongo* class; Two BB–XCV; Two CV–*Unryu* class; One CV–hull *Unryu* class; One CVL –*Ryuho;* One CVE–*Kaiyo;* Two CA; One CL."

TYPICAL EXAMPLE OF JAPANESE SHIP CAMOUFLAGE THAT FAILED

USSBS found these reports to be 100% correct. The Japanese corroborated the PI report, stating all of the ships reported were in the harbor on the dates stated. Not bad!

A photo mission went over Tokyo harbor in November, 1944. Pilots reported, "some building activity." PI was slightly more graphic, they sent separate reports out on progress in various shipbuilding yards. For example:

AIRFIELD DISPERSAL AREA: B-29 DECOY IN UPPER LEFT CORNER

On 25 November, 1944, PI reported a cargo vessel building 5% complete, length 445 feet. Japanese reports keel laid on 443 foot cargo vessel 17 November, 1944. Two feet off–hmmm. Same vessel was reported 65% complete by PI on 16 January, 1945, estimated launching end of January. Japanese were a few days behind schedule. They did not actually launch this ship until 5 February. (Our PI team was probably influenced by Kaiser's schedules. The Japanese builders weren't quite so fast.)

LET'S GO on to damage assessment. That was a tender subject occasionally. Some eager lad would come home loudly proclaiming he had just knocked the whole bow off a Jap carrier, only to hear the photo interpretation team say, "Sorry son, your bomb only made a hole 25 feet by 10 feet in the forward hangar deck." Who was more accurate?

Pilot reported, "Why I blew him clear out of the water." PI states: "The BB-XCV received a 20′ x 20′ hole on port

side at edge of staging deck 130 feet from stern. Hole in staging deck extending aft of mainmast for 50 feet and from centerline starboard side of ship. Ship low by the bow probably resting on bottom. Main deck awash.

Japanese record states: After attack ship settled by bow. Ship abandoned 1800, date, after settling on bottom—15 degree list to starboard. All other statements concur with PI assessment. Except for missing the 15 degree list, PI hit it right on the nose.

Conclusions and recommendations of the USSBS were as follows: Ship movements and identifications; almost entirely accurate. Shipbuilding; generally accurate, although some reports slightly over-estimated the rate of progress since interpreters were influenced by similar American production rates. Damage assessment; correct within reasonable limits. Severe damage by internal fires and explosions, underwater damage and direct hits which left no visible evidence were impossible to evaluate.

Before every strike on Japan, pilots received complete information regarding location of airfields, type and number of planes based in the target area, location of gun emplacements, etc. The information was almost always complete and accurate. The pilots accepted it as a matter of course and few "gripes" were ever voiced on this phase of PI. However, it is doubtful if the pilot realized just what was involved in a briefing lecture, or how it happened to be correct.

A LIST OF factors included in airfield intelligence follows: Field location, determination of field's use, field's classification by potential capabilities, i.e. size and number of aircraft it was capable of handling, a complete description of number, length, width, orientation and surfacing of runway, a listing of number, type, condition and disposition of planes, planes dispersal areas, a description of hangars and facilities and identification, and the locations of defenses and electronics installations at the field.

USSBS has evaluated the reports sent out by PI and found that airfield intelligence was exceedingly accurate and thorough. Location, dimensions, orientation and determination of actual use were around 90% accurate. Surfacing interpretation and classification by potential use were good but not quite so accurate as the other phases.

Surfacing was one of the most difficult features about airfields to interpret correctly. Actually PI was about 75% correct in analysis of surface types, however a few glaring errors were made due to certain factors. In all cases of error,

PHOTOGRAPHS SUCH AS THIS WERE USED IN DAMAGE ASSESSMENT

field serviceability was overestimated. Gravel, packed earth, and even grass runways were misinterpreted as paved surfaces on occasion. Inadequately drained fields were not always so reported. Errors in runway surfacing are explained primarily by the fact that gravel, packed earth and closely-cropped grass surfaces reflect about the same amount of light as paved surfaces, and as a result have nearly the same appearance on photographs.

THE CLASSIFICATION of Japanese airfields according to potential use, on the basis of the system of surfacing and dimensions definitions developed in the ETO did not always give a true indication of actual use. The great majority of errors of this sort, were caused by misinterpretation of field surfacing. In 80 percent of such cases surfaces were fair-weather rather than all-weather as reported.

Airfield identification by actual use (training, combat, etc.) when employed to supplement and check ground information was 95 percent correct.

One of the problems encountered was the misinterpretation of poorly drained fields. During normal periods of weather, it is almost impossible to tell whether a field has proper drainage facilities or not. Another reason interpreters did not always catch poor drainage is because it is a problem rather foreign to the American airfield. Drainage was often assumed to be good, because American drainage would have been good at the same size and type airfield.

PICKING THE TARGET FOR TONIGHT—ELEVEN MIDGET SUBMARINES AND ONE LONE JAP SHIP BEING EARMARKED FOR FUTURE VISITS

PHOTOGRAPHS OF SAME JAPANESE BEACH TAKEN AT VARYING TIDE LEVELS; THIS TYPE PHOTOGRAPH WAS USED IN WATERLINE METHOD

Beach Intelligence Was a Very Important Phase of Pacific Amphibious Operations

THE USSBS recommends more research be devoted to a comparison of photographs showing fields of known surfaces with those of unknown surfaces in future interpretation. Also, the use of infra-red film, because of its selectivity for chlorophyll, might eliminate identifying cropped grass runways as surfaced runways. The use of color film was also recommended by USSBS.

Of course, this Monday morning quarterbacking is just as easy for PI as for USSBS, and these methods are certainly being studied for future airfield interpretation.

Beach Intelligence, prior to the last war was practically an unknown field. As a result, our early attempts at beach intelligence in the Pacific were relatively crude, developing however, with additional experience and research to a very precise science toward the latter stages of the war in the Pacific, with additional experience and the influx of methods developed in the ETO.

Certain information is required to insure the successful planning and staging of an amphibious operation. A complete knowledge of beach gradient, beach approaches, offshore depths and underwater obstacles is essential to insure that landing boats will be able to reach the beach. Knowledge of beach defenses enables the operation Commander to choose the most logical invasion point, all other factors considered, of course. Exits from the beach to the interior are of utmost importance so that invasion forces can move off the beaches as rapidly as possible. Beach intelligence intends to furnish all of this necessary information.

Our experiences in the Gilberts, especially Tarawa atoll, brought into sharp focus the importance of photo intelligence in amphibious operations. The two major problems at Tarawa were the reef and the extensive and complex beach defenses. Development of plans for solving both problems was entirely dependent on detailed knowledge of both the beach and its defenses. Up to the time of the Tarawa campaign estimates of water depth in the Pacific were made solely by qualitative and comparative methods, i.e., one spot was judged to be deeper than another because it "looked deeper" on the photographs. Unfortunately, some important factors affecting appearance of the bottom are unrelated to depth, so that appearance of depth frequently is deceptive.

NEVERTHELESS, at Betio, in spite of relatively primitive methods of beach intelligence, and with only fair photography, interpreters were able to plot most of the greatest collection of defenses and obstacles thus far encountered. The ensuing difficulty with the reef was due more to a failure to utilize available information, than a lack of that information. Naval planners were not yet willing to accept the reliability of PI against intelligence obtained from other sources—Tarawa did much toward proving that reliability for once and all.

Our experiences at Tarawa, which were a little bitter in some respects, also demonstrated the need for more accurate methods of water measurements. More advanced systems had been developed in the Atlantic theatre, and these methods were incorporated into beach analysis in the Pacific, in addition, research was instituted along quantitative lines in the belief that something measurable on photographs could be related to depth. Comparative methods however, continued to be used in the Pacific until late 1944. The reliability of these estimates, as well as other aspects of beach intelligence, steadily improved as interpreters gained experience.

Research in quantitative determination of underwater depths resulted in the development of three practical methods, two of which were successfully used in Europe prior to the end of 1944. The three methods employed in measuring beach gradient, beach approaches, offshore depths and underwater obstacles were the "wave velocity," sonne stereo," and "waterline" methods. Wave velocity and waterline were first used in the Atlantic.

IN WAVE velocity, depth is related to velocity of waves moving into the beach. In the sonne stereo method, depth is related to the difference in parallax between a point on the surface and a point on the bottom. In the waterline method, the contour of the beach between low and high tide is photographed to give elevation of the strand line.

Each method has its advantages and disadvantages, but

CLOSEUP OF JAP GUNS SHOWING MATERIAL USED FOR CAMOUFLAGE

used in conjunction with one another they are an extremely accurate way of gaining needed beach intelligence. Accuracy of all three methods is dependent largely upon the training and experience of the interpreter. The work is of such an exacting and tedious nature, that few interpreters become completely proficient.

USSBS evaluations of beach intelligence have shown that offshore depths up to 10 feet can be determined with a normal error of less than 1 foot. In depths more than ten feet, accuracy falls off somewhat, but overall beach intelligence is entirely adequate if taken just prior to the operation, before erosion, etc., has had an opportunity to make substantial changes in underwater contour.

BEACH DEFENSES, exits and beach limits presented no difficulty. Regular photography methods were used and proved to be very accurate.

USSBS recommends that there be direct liaison between research groups in the United States and operational units in the field, thus, the latest methods of analysis can be used as they are developed in research and development centers in the U.S. Command and Staff officers should be thoroughly acquainted with the potential utility of photo intelligence in amphibious operations. Specialists should be trained more nearly to meet the needs of the field units.

The Navy's PI center reports there will be considerable improvement in the field of estimating underwater depths, especially in depths beyond 10 feet. Quantitative trafficability, i.e., the amount of traffic a beach can handle, whether the sand is soft, hard, etc., is receiving special emphasis and will be much more accurate in the future. Studies are also being conducted of the various geologic and vegetative types that are to be found on beaches, which will improve that phase of analysis in the future.

During most of World War II, Japanese efforts toward concealment, deception and camouflage were not subjects for a special field of photo interpretation. Instead, they were treated in a routine manner as they occurred in relation to standard subjects of reporting, i.e., airfields, shipping, etc., and were not considered troublesome or significant. However, when the aerial bombardment of Japan forced the Japanese to disperse vital military and industrial facilities, the detection of efforts toward camouflage and concealment became important. The war ended before Japanese attempts to hide essential targets assumed great operational significance, but the threat implied to the effectiveness of photo interpretation caused much speculation on the future usefulness of photographs as an intelligence source.

Underground construction was used by the Japanese to conceal and protect; dummies and decoys were used to deceive. For camouflage purposes, the Japanese employed camouflage paint, used standard sod-covered dispersal buildings, nets, garnishings and false structures. In addition, some use of natural features and terrain was made.

THE MOST effective type of concealment used by the Japanese was tunnels, for though tunneling might be identified from the air, the type of work or installation inside was very seldom apparent or correctly interpreted. Often underground factories were interpreted as storehouses and were not given the importance they merited. This type of concealment is also, the greatest threat to photographic intelligence in the future. The clues ordinarily present, according to standard training doctrine—namely, extent of spoil and track activity—were often unrelated to the function of the tunnel. This type of concealment was particularly effective in and around Yokosuka during the last war, since the terrain was rugged, where there were steep low hills and narrow valleys, and where road tunnels were to be expected in the normal course of road and rail systems.

ATTEMPT TO CAMOUFLAGE ANTENNA WAS NOT VERY SUCCESSFUL

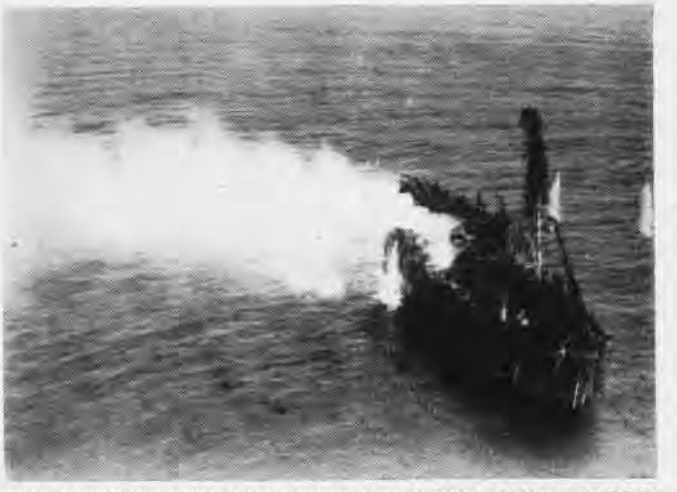
Another very efficient method used by the Japanese to hide installations, equipment and materials, was their use of natural terrain features, such as small groves of trees. This system was usually used for small supply dumps or aircraft dispersal.

Dummies and decoys were fairly successful for the Japanese. If an aircraft's position remains the same for a long period of time, it can be assumed to be a decoy, but decoys are light and easy to move by hand, so if the method is properly used, it is difficult to discover. If a gun emplacement never shows track activity it can sometimes be correctly interpreted over a period of time.

The use of camouflage paint by the Japanese posed no problem for photo interpreters. It was used with little skill in Japan and often was not used with an eye to adjacent facilities or surrounding terrain.

Sod-covered buildings were occasionally misinterpreted, but almost always located due to surrounding facilities and track activity. False structure and garnished nets met with some degree of success on small installations in Japan. Although well-concealed emplacements were outlined by the nets concealing them, it was not always possible to tell what they hid, even though their general shape gave them away.

THE USSBS recommends a closer liaison between the different branches of intelligence, to give a more complete knowledge of enemy underground activity. PI can supply an important percentage of information on underground installations and authenticate information gained from other sources, but cannot hope to get best results from their own observations alone. Intelligence goes far toward winning wars.



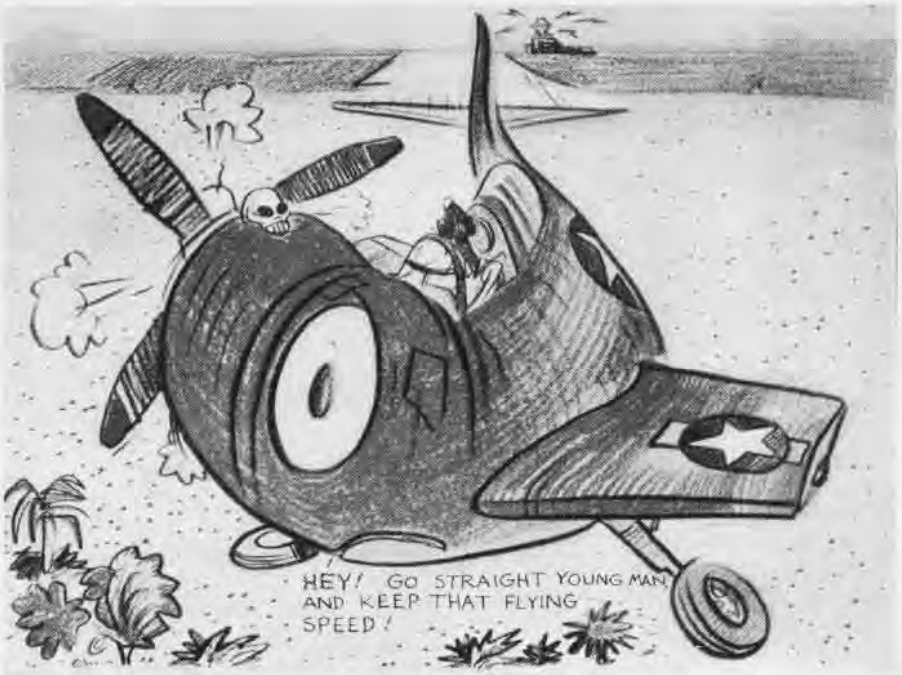
THIS ANCHORED COCOANUT GROVE DIDN'T FOOL ATTACKING PB4Y

GRAMPAW PETTIBONE

Fatal Mistake

The pilot of an F6F had an engine failure at 500 feet shortly after take-off. He wrapped his plane up in a tight turn back toward the runway he had just used, called the tower for emergency landing clearance, and made a successful downwind landing. He got away with it, but his commanding officer cautioned him about turning back to the field at low altitude after an engine failure.

Three days later, after the plane had been given a thorough check in an effort to find the cause of the earlier failure, the same pilot took off again on a test flight. This time the engine began to mis-fire at about 300 feet, and once more the pilot rolled into a 60° bank to the left in hopes of making it back to the field. He held the steep turn until just before he crashed 300 yards short of the runway. The plane burst into flames on impact and was destroyed. The pilot did not get out.



Grampaw Pettibone says:

Once in a while you can get away with a stunt like this, but most of the time it ends just as badly as it did here on the second try. I know it's hard to resist the urge to turn back to the field when an engine quits, but you've got to resist turning back if you ever hope to be the oldest living naval aviator.

A controlled wheels up landing in the best area ahead of your plane may tear up the underside of the fuselage, but you can count on walking away from the wreck under your own power. When you try to reverse your course and get back to the field after a power failure, you are likely to spin or stall or fly into the ground on a wing tip, and survivors from such accidents are mighty scarce.

"Dear Grampaw Pettibone:

"An instance recently occurred at NAS ALAMEDA which illustrates the importance of keeping log books up to date. Several SB2C-5 aircraft were being prepared for ferry to overhaul bases by this activity. The preparation involved examination of the log books to determine if there had been any unusual occurrences in the plane's history and processing of the aircraft under Local Process Specifications designed to meet the minimum requirements for ferrying of aircraft. As these aircraft have not had excessive time and have been reasonably well preserved during storage, disassembly and magnafluxing of primary structural parts is not considered essential in the preparation of the aircraft for ferrying to overhaul bases provided the aircraft logs do not indicate that the plane had been subjected to hard landings, barrier crashes, etc.

"One of these aircraft, while being towed by a tractor in the process of being prepared for departure to the overhaul base, amazed all hands concerned by losing an engine. This engine did not lose power, manifold pressure, or RPM, but actually fell off the airframe. Re-examination of the log book of this aircraft, which incidentally was very haphazardly kept, did not indicate that the aircraft had been damaged in any fashion. However, the last hop which the plane made, as shown in the log, involved a night carrier landing. The airplane also gave some limited evidence of having experienced a barrier crash. The true history of the aircraft was not reflected in the log book entries. The inspection processes utilizing log book information were thus rendered unreliable and quite obviously this shortcoming could have serious implications.

"No action concerning the activities involved in the foregoing is feasible at this time as the activities believed to be involved have been decommissioned. However, we think you will be interested, Grampaw, and may desire to publicize the matter in the interests of better log keeping."

Grampaw Pettibone says:

Don't kill your friends, fellows. If you've jarred the living daylights out of a plane on a hard landing, put it down on the yellow sheet. Then the plane will be inspected thoroughly for possible structural damage and an entry will be made in the plane's log book. If you fail to report such an instance you are jeopardizing the life of the next pilot who flies that plane. If he is killed, according to Grampaw's understanding of the law, you then become an accessory before the fact and should be charged with PILOT SLAUGHTER!

Accident Reports Due in 10 Days

Regulations in the BUAER Manual and in Aviation Circular Letters 119-45 and 113-46 provide instructions for the reporting of aircraft accidents. These reports should be submitted within 10 days after each accident.

That some activities are lax in following these directives is indicated by the fact that during the last year approximately 30 accidents were reported by despatch only. In other cases the AAR's were not received until several months after the accident.

The AAR is the principal source of information relative to the cause of aircraft accidents. If immediate action is to be taken to prevent similar crashes, these reports must be sent in promptly. Failure to do so may cost some pilot his life in an accident which might have been prevented.

Frozen Selector Valve

Here's a yarn from an F4U pilot who set out on a cross-country flight from Norfolk to Miami and survived the rugged crash pictured to the right.

After take-off he shifted his fuel selector from main tank to right standby and climbed to 20,000 feet. Leveling off here, he planned to draw gas direct from his drop tank for the first two hours and then shift back to the main tank. All was well for the next hour and a half, and then . . .

"About 45 mi. north of Charleston my engine began cutting out. Since the transfer light had not come on and I hadn't expected 150 gallons of fuel to be used before two hours, I was very much surprised. I put the mixture control in auto-rich, switched on the emergency fuel pump, and attempted to switch the gas selector valve to main tank. The valve would not move from the Right Standby position. It was frozen in position, and with both hands I couldn't budge it. I tried to start the engine with prime, but it didn't work.

"At this time the fuel warning light blinked twice. I found my shoulder straps, put my belt on, and hoped like hell I'd be able to turn the selector valve at a warmer altitude. I had to leave the shoulder straps unlocked to work on the valve. The plane was flying crazily since I was using both hands on the gas selector and the control column was just in the way as far as I was concerned. At 4000′ I decided that the valve wasn't going to turn, my hands were numb and bleeding from trying, so I looked around for a likely place to crash-land.

"The field I picked at 4000′ developed a neat row of high tension poles when I got to 2000′, so I decided on a dirt hi-way that seemed fairly wide and was into the wind. I'd jettisoned the belly tank and opened the hatch with some trouble, the safety latch was slightly up and would not allow the hatch to fully open. Remedying this and locking the canopy open, I again tried to turn the selector valve, it was still frozen, or stuck—or somethin'. I was turning in toward the road at about 400′ and saw three people running down it in the same direction I intended to land. I cut the switches, locked my shoulder straps, and used both hands to cinch them up tight. It seemed inevitable that I would hit the three people who continued to run down the road ahead of me. I was sweating them out, and overshot the road slightly before looking over to the left too late to keep my left wing from hitting a pair of 65′ gum trees. The plane began coming apart, and although I didn't get knocked out, I

don't know what happened after the initial contact was made.

"The cockpit stopped about 300′ past the trees and about 30′ from the road. I was inverted in the cockpit with my head touching the ground. I unbuckled my chute and noticed my little finger on the right hand out of joint. I put it back in place and undid my safety belt. I was making some progress at crawling out on the back of my neck when some farmers came and helped me the rest of the way out. I put my finger back in place again. The plane had broken at the main tank, about 2′ behind the cockpit, the starboard wing was sheared off and port wing tip was gone. The engine and accessory sections were about 100′ further up the road."

Grampaw Pettibone says:

Another orchid to the man who invented shoulder straps, eh, son?

As you doubtlessly know, the fuel system in the F4U-4 is designed so that you don't have to run directly off the drop tank. In fact, there are several good reasons for running with the transfer system on and the selector valve set on main tank. One is that the drop tank is not pressurized and you will therefore be likely to experience trouble when drawing gas directly from this tank at high altitudes. Also the booster pump is located in the main tank and is therefore of no use when the selector is on some other tank.

The Right Standby position is for emergency use in case the transfer system fails. Operation on this position should be checked on the ground during warm up.

The accident board was of the opinion that a slight amount of water in the drop tank caused the selector valve to freeze at high altitude. The valve worked normally when checked on the ground after the crash.

At Last—An Honest Man!

My files are full of lengthy statements from pilots involved in wheels-up landings. Some of the boys even describe what they had for breakfast, how many push-ups they did at morning calesthenics, where they flew before the landing in question, and just about anything else they can think of to delay getting to the point where they have to say "I forgot my wheels." So, its refreshing—once in a hundred or so accidents—to run across a pilot's statement like the one below:

"Following a cut on a FCLP pass in a TBM-3, I made the landing, then commenced the takeoff. I added throttle and with forward stick put the aircraft in normal takeoff run attitude. I then hit the flap control to retract the flaps. Just about a tenth of a second later I again reached down to check my flap control in the 'up' position. The aircraft was not as yet airborne and was acting as if the flaps were still down. I inadvertently hit the landing gear lever—the realization came immediately and I snapped the lever to the down position and added back stick pressure. The wheel indicator read just short of the halfway down mark, when the prop bit the deck.

"The aircraft finally ground to a stop. A small fire developed on the port side of the engine; it was extinguished by the crash crew.

"This was not an attempt at a 'hot pilot' takeoff, so-called. The accident could definitely have been prevented by total concentration on what I was doing, rather than automatically reaching down and heedlessly grasping the control lever.

"A pure case of 'doping off'."

....., Lt. (jg), USN

Grampaw Pettibone says:

The compliments of "Diogenes" Pettibone to you, young man!

"Dear Grampaw Pettibone:

"There has recently been an argument in this squadron regarding the glide ratio of an F4U *Corsair*. A Handbook was shown me, in which the glide ratio was quoted at 13 to 1. This was with a dead stick. Is this correct?

....., Ens., USNR"

Grampaw Pettibone says:

Could be. In fact, in the clean condition and with no wind, it will glide about 15 feet forward for each foot down.

Dilbert Was Here!

The F8F pictured above is waiting in the bone yard to be scrapped. Its back was broken when Dilbert failed to answer a "Low" signal from the L.S.O. and the plane hit the ramp. Fortunately it bounced up on the deck and Dilbert survived.

HEADED OUT ON A LONG MAPPING MISSION OVER ANTARCTIC COASTLINE. A MARINER CUTS ACROSS BOW OF THE U.S.S. CURRITUCK

HIGH JUMP

High Jump airmen managed to photograph several hundred thousand square miles of Antarctica before gathering ice packs sent Task Force ships scurrying for warmer water. Although some of the world's worst weather kept planes grounded four days out of five, *High Jump's* ski-rigged R4D's, tender-based *Mariners*, helicopters and small amphibians played a major role in the operation. Mission was training, mapping and testing gear.

HELICOPTER GUIDES SHIPS THROUGH THE ROSS SEA ICE PACK

SENIOR PILOT BRIEFS PBM AIRMEN ON DAY'S MAPPING MISSION

Mariner from Western Task Group watches ships of Central Task Group play follow the leader through the Ross Sea ice pack.

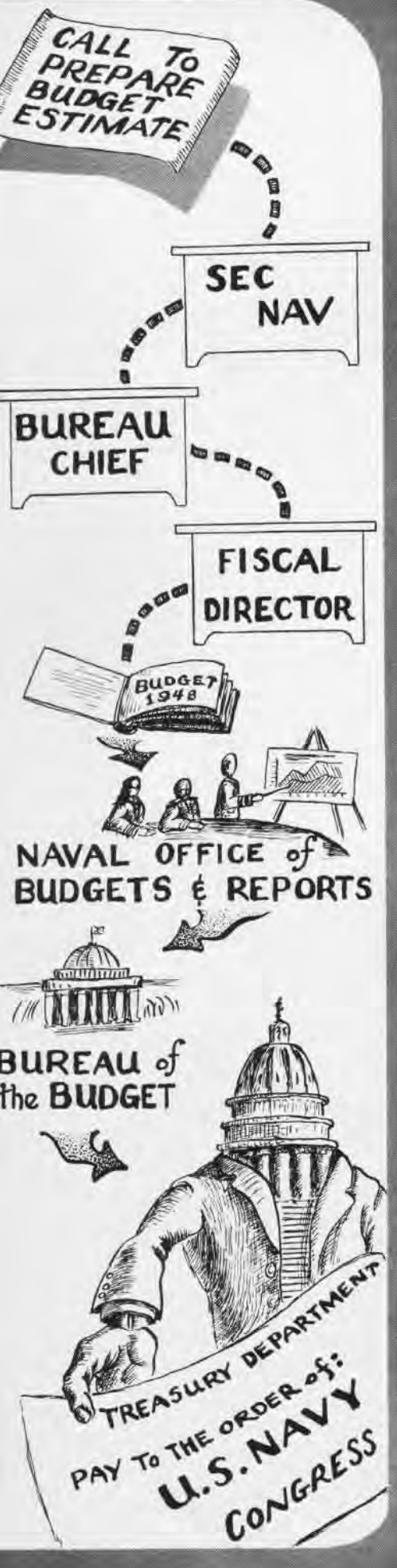
Aboard *Philippine Sea* technicians install metal skis on R4D-5's so airplanes can land on the snow of Ross Sea ice shelf.

Workmen use steel matting to bridge a crevasse on Ross Sea ice shelf as transport *Yancy* unloads supplies for Little America.

Six R4D-5's made JATO take-offs from flattop and landed on snow at Little America. These planes were left in Antarctica.

Rear Admiral C [illegible] aboard the Coast Guard ice breaker *Northwind,* goes aloft in a helicopter to survey the ice pack from above.

Maintenance men kept planes in flying condition regardless of the weather. Here a technician attaches blade on a helicopter.



BUDGETS AREN'T BEST SELLERS

FITTING the financial demands of the world's largest and strongest Navy into a pattern of post-war economy calls for finesse, foresight and frugality.

This is the story of how the Navy Department, and more particularly its aeronautical organization, prepares a budget for the jet propelled age that will be fiscal 1948.

The Navy keeps a staff of civilian and officer fiscal experts working 52 weeks a year preparing its budget. In that time they plan, justify, write, rewrite and finally defend before committees of Congress the budget estimates that will be required to maintain and operate America's globe-spanning naval forces for the fiscal year ahead.

Whether preparing budgets or planning a battle, good naval technique insists on an estimate of the situation. For budget purposes this estimate is all wrapped up in 14 basic planning directives prepared by CNO, the General Board and the Office of Naval Research. All basic plans must be in the hands of budget-making offices not later than 1 July, 12 full months ahead of the fiscal year they were written to govern.

Actually fiscal 1948 doesn't begin until 1 July 1947; it won't end until 30 June 1948. But fiscal 1946 still had several weeks to run when the Navy started sweating out the budget estimates that were to finance it 53 weeks later.

OFFICIALLY it all starts when SECNAV gets the "Call." That's how people in the budget business refer to the official request for fiscal estimates sent out by the President's Bureau of the Budget. Their request, for 1948 estimates landed on SECNAV's desk on 24 June 1946. He immediately transmitted the request for estimates to the Navy's budget making offices.

Following the rigidly-prescribed form, each of these offices immediately sets about preparing its budget estimates for the year ahead. While all estimates fit into the general framework of Navy Department policy, each is acted on separately and will, when finally approved by Congress, remain a separate appropriation.

On V-J Day the Navy was an organization of nearly 5,000,000 men, 7,500 ships and 45,000 planes. It was safe to say that nothing safely moved upon, beneath or above the surfaces of the seven seas without the United States Navy's permission.

Paring down that tremendous fighting force to fit peace-time requirements in a still-troubled world requires the patience of a Job and the wisdom of a Solomon. The products of that wisdom and patience are contained in the following 14 policy-making and budget-determining directives for fiscal 1948:

1. Fleet Employment Plan
2. Operating Force Plan
3. Naval Aeronautic Organization*
4. Navy and Marine Corps Personnel Plan
5. Training Program, Regular and Reserve
6. War Reserve and Logistics Stock Level Plan
7. Tentative Availability of Ships at Naval Shipyards
8. Materiel Improvement Plan: (*a*) Vessels, (*b*) Communications, (*c*) Aircraft*
9. Shore Establishment Operating Plan*
10. Building Program, Ships
11. Procurement Program, Aircraft*
12. Shore Station Development Program
13. Special Weapons Program
14. Research and Development Program*

From a budgetary standpoint BUAER's primary interest lies in those plans marked by the asterisks. The Bureau of Aeronautics budget, based on DCNO (Air) planning, lists all funds to be spent on Naval and Marine Corps aviation during the fiscal year. Back in the days when every naval aviator knew every other naval aviator by his first name, it took only five figures to write BUAER's budget. World War II changed all that. Today it takes big money to buy brass knuckles for the hard-hitting air arm of America's first line of defense.

THE FOUR subdivisions of BUAER's 1948 budget include construction of aircraft; instruments; maintenance and operation; research and development. Cost for the officers and men of the aeronautical organization is a joint BUPERS and BUSANDA budget item. BUAER, however, must provide in its budget for civilian employees.

Navy fighter pilots who may be wondering when they can check out on a jet job, need look no farther than the construction sub-division of the BUAER budget. That budget, when it's finally approved by Congress, will contain most all the answers. Either it's jets or it isn't. Congress provides the cash.

BUAER, in conjunction with DCNO (Air), recommends in its budget estimate the number and type of aircraft replacements the Navy and Marine Corps and their reserves require.

WITH instruments it's pretty much the same story. BUAER's budget in fiscal 1948 provides for photographic and aerological equipment for the entire Navy. In addition the instrument budget lists all air-borne navigational and electronic equipment needed.

BUAER DIVIDES FUNDS BETWEEN NEW CONSTRUCTION, RESEARCH AND DEVELOPMENT, MAINTENANCE AND OPERATION AND INSTRUMENTS

In the maintenance and operation sub-division, BuAer's budget provides for every gallon of aviation gasoline and lubricating oil to be used in Navy and Marine planes during fiscal 1948.

And if you think oversights and omissions in this section of the budget can't be serious, just ask somebody in lighter-than-air. Because of a legal technicality involving an accounting transfer, the 1948 fiscal estimates failed to provide for helium purchases. And that all-important item had to be inserted after the budget had gone to press.

Even a small item like cargo parachutes, when it's omitted, can cause havoc. In fiscal 1947 the Marines did a lot of sweating to scrape up the cash for cargo chutes needed in the aerial delivery of supplies.

Military budgets in fiscal 1948 will be as streamlined as a jet fighter. Fiscal forgetfulness can be frightening even when it isn't fatal.

Research and development items in the 1948 BuAer budget cover the aeronautical organization's experimental and test activities and the cost of experimental projects performed under contract by private companies. In this age it's research that pays off.

Aeronautical budget estimates for 1948 were all back in the hands of the Bureau's fiscal director on 22 July 1946. There the Chief of the Bureau and his division heads went over every detail.

As finally approved in BuAer, the budget for fiscal 1948 was a compact 225-page book listing recommended and necessary expenditures. BuAer's budget for fiscal 1948 was ready for its first flight test, to be conducted by the Navy's Office of Budget and Reports.

The O.B.&R. director, Rear Admiral Herbert G. Hopwood, held BuAer hearings on August 9 and 10. Armed with charts, statistics and fists-full of facts, the Chief of the Bureau of Aeronautics and his assistants took two full days to justify the 1948 estimates.

Four weeks later, on 5 Sept., the budget, coordinated to fit the finely-machined all-Navy pattern, was back in BuAer's hands for re-writing. Pared down in dollars, but boosted to 280 pages, the fiscal estimate was ready 10 days later for its second hurdle. This time the Bureau of the Budget, a presidential agency established in 1921 to review and coordinate budget estimates in federal government, took the controls.

After three full days of fact-finding, soul-searching hearings, BuAer brought its 1948 estimates back to the Navy Department and began writing in, or off, the Budget Bureau's recommendations.

Jam-packed with justification and detailed to fit the Bureau of the Budget's neat $706,000,000 figure, BuAer's final estimate for fiscal 1948 was a 383-page book. In recap form it covered two pages of the mailorder catalog-size Budget of the United States that President Truman delivered to Congress a few days after New Year's. BuAer's budget, all 383 pages of it, supplements that report.

Pruned to presidential specifications, BuAer's budget like every other one of the Chief Executive's fiscal recommendations, was dropped into the lap of the 43-man House Appropriations Committee. Those 43 Congressmen are so powerful we almost said lap of the gods.

A seven-man sub-committee of Congressmen, this session they represent Vermont, Indiana, Missouri, Kansas, California, Texas and Maryland, passes on all Navy budgets.

Sub-committee recommendations go to the House Appropriations Committee where they are adopted, with or without alterations, and incorporated in the final appropriations bill submitted to the House of Representatives.

Hearings before the naval appropriations sub-committee of the Senate follow, in general, a similar form. If, as usually happens, the finally-approved Senate and House versions of a particular budget vary in form and amount, conferences between representatives of the sub-committees concerned reach a final understanding.

It takes time to pull open the federal government's purse strings. Fiscal 1947 was nine days old before the Navy's final budget passed the House and Senate and became law.

This year, with all hands in and out of the Navy struggling to cut federal costs and still maintain national security, it's a safe bet that the "Call" for fiscal 1949 will be on SecNav's desk days before Congress finally approves appropriations for fiscal 1948. Planning within the Navy is already underway for fiscal 1949.

Budget writing is just one fiscal year after another. There are no by-lines and up to now not one best seller.

DID YOU KNOW?

Forecasting Tough Job in China

Lack of Data Makes Weather a Problem

MAG-24, CHINA—Weather forecasting in this advanced zone isn't quite as primitive as holding up a wet finger in the wind, but neither is it as well developed as in the United States, the Headquarters Squadron reports.

This is due primarily to poor communications. Aside from hourly reports from Tientsin, Tsingtao, and occasionally Shanghai, hourly weather reports in this area are practically nil. Intermittent synoptic reports are received from the Chinese meteorology office.

These reports cover most of the China region to the south. Weather reports from the northwest, from which most of the weather in this area moves, are broadcast by the Russians. Due to communication difficulties and obsolete broadcast data, these reports cannot be picked up. Weather reports and analysis from Guam are received intermittently but cover only areas to the south and east.

In the absence of these reports, the forecaster is forced to rely on local observations, local experience, and frequent reference to an AAF book on China weather. Fortunately, during the winter most of the bad weather is local—poor visibility due to smoke. Accurate forecasts can be furnished locally for a period of six hours. Forecasts for longer periods are virtually impossible due to conditions above.

Seaman's Coolness Saves Plane

Guam Heroism Wins Him Commendation

VR-7, GUAM—Coolness in an emergency when fire broke out while refueling a Pan American clipper won a commendation for James H. Cole, S1c, from COMNATSASIA.

Fire broke out in the vicinity of the auxiliary power unit in the trailer. Despite temporary blindness from the flash, Cole reached through the flames, turned off the pump motor and closed the gas valve to the hose. The fire kept him from reaching the CO_2 bottle, so Cole jumped aboard his truck and drove it, enveloped with flames, away from the aircraft before he himself jumped clear.

Under the *fluorescent lights of the Lockheed plant at Burbank, Calif., three of the Navy's fleet of P2V's are being assembled for delivery to the service. Longest range plane in the world today—at least holder of the world's distance record—the* Neptune *in its early versions is carrying .50 cal. machine guns such as are installed in the nose turret. Later models will have other armament. P2V's distance record is 11,236 miles.*

If you *look real hard you can see a man near the top of the tail of the Lockheed* Constitution, *doing a little polishing on the 50-foot rudder. Plane will go to NATS after preliminary testing flights*

Mechs Park 850 Private Planes

Navy Aids Junior Chamber of Commerce

Fifteen enlisted men at NAS Los ALAMITOS added another job "well done" to the Navy peacetime mission.

On 9 March, 1947, the Junior Chamber of Commerce of Los Angeles sponsored the Sixth Annual Breakfast Flight to Palm Springs, Calif. This event has experienced a steadily-growing popularity, and this year it reached unexpected proportions when 850 private planes took part carrying 2000 guests.

On a purely voluntary basis, on their regular day off, 15 men from NAS Los ALAMITOS agreed to assist in the enormous problem of parking planes in their assigned areas. The men were flown to Palm Springs early in the morning, equipped with yellow jerseys and helmets, and briefed on their duties. It turned out that they were the only personnel on hand to do a really tough parking job. They accomplished this in true Navy fashion by not scratching a single wing-tip. The men received recognition from all participants and were highly lauded by Col. J. C. Mariott, head of C.A.A. for this area who personally handled the control tower.

A flight of eight fighters and two torpedo planes were invited to participate. The flight, led by Lt. Comdr. Wayne Morris, circled the field at least 20 times before finding a clear spot to land among all the private planes.

CIVILIAN PLANE BEING PARKED BY EXPERT

The entire group of Navy men and officers were royally entertained by city officials and the Chamber of Commerce officials in gratitude for their services. All hands definitely want to go again!

St. Elmo Haunts NATS Transport

Display Burns Hole in Hotshot Wing Tip

VR-3—The Bermuda NATS flight was not the only one to have an electrifying experience last month (see page ~~24~~). Flying over the mountains near Amarillo, Tex., on 12 March, Lt. F. V. Scott watched a spectacular display of corona, mainly on his port wing tip.

What Lt. Scott didn't know was that his plane was receiving the old hot-foot, aviation version. Inspection of the R5D during its next routine engineering check showed a small section of the port aileron frame burned as if by a blowtorch near the static wick.

Navy to Aid Legion Air Program

Aviation's Importance to Be Stressed

To promote active public interest in the importance of a strong American aviation to world peace and national security, the Navy has pledged its cooperation to the American Legion in a nation-wide program to promote peace power through air power. The Navy's part in the program opened by Rear Admiral J. J. Clark at the Legion's National Aeronautics Conference in Indianapolis on March 20 will be continued throughout the year by Commanding Officers of all naval establishments and their Public Information Officers.

A six-point program for the promotion of American air power has been planned by the Legion. Through intensive aeronautical research, industrial preparedness, a healthy air transportation, an alert aircraft industry, intelligent public airmindedness, and strong air forces, the Legion hopes to make the United States into the nation which will be the mistress of the new sea—the air. The place of the Navy and the PIO is apparent.

The American Legion's patriotic program affords the Navy an excellent opportunity to sell the importance of peacetime Naval Aviation to the public.

PEARL HARBOR FIVE WINS TOURNAMENT

PEARL HARBOR'S hard-driving entry in the all-Navy basketball tournament didn't travel all the way to Chicago just for the ride. Champions of the Pacific area, they defeated Moffett Field, Quantico, and the Camp LeJeune Marines in that order to claim the all-Navy championship.

Pearl Harbor was never seriously extended in winning the tourney. The 57 to 45 margin over LeJeune's Leathernecks was as near as the island club came to defeat. They downed Moffett Field and Quantico by 13 point margins.

Third place winner in the tournament staged at Great Lakes on March 26 through 29 was the Marine Air five from El Toro, champions of the Eleventh Naval District. El Toro eked out a 58 to 54 victory over Quantico.

The NAVAL AIR TECHNICAL TRAINING team from Jacksonville won the consolation round by downing Moffett Field 56 to 39. Moffett Field had entered the consolation round by virtue of a 48 to 40 win over NATB PENSACOLA.

Jacksonville, after losing a 57 to 56 heartbreaker to Camp LeJeune in its tourney opener, came back to oust Quonset Point from the consolation round 63 to 52. Quonset lost its opening game to the El Toro Marines 59 to 41.

The tournament was the first all-Navy sports competition of any kind conducted since 1940. Pearl Harbor, by winning the tourney, claims one leg on the James V. Forrestal trophy. Three championships by any team means permanent possession of the trophy.

HAWAII QUINTET WITH FORRESTAL TROPHY

To enter the Great Lakes competition a team had to fight its way to the top in district competition. Every one of the eight teams entered at Great Lakes was a naval district champion.

The Forrestal trophy was presented to the winning team by Vice Admiral George D. Murray, commandant of the Ninth Naval District and wartime head of the Naval Air Training Command. Members of the winning squad received Navy belts with the All-Navy buckle in gold and silver. Gold and silver medals went to members of the other placing teams.

Except for the champions from Pearl Harbor, the tournament was dominated by Marine Corps and Naval Air teams. Four of the eight tourney entries represented naval air activities and three others were from Marine Corps establishments.

NAVIGATION QUIZ

PUZZLERS

1. Lines drawn through places of equal magnetic variation are known as _____ lines.
2. Navigating through a high pressure area in the Northern Hemisphere, one could maintain the best ground speed by keeping to the _____ (right or left) of the center of the eye.
3. Relative to the aperture diameter of a MkV aircraft sextant, how large should the bubble diameter be for normal observations, (¾, 1/5, ½ or 1/6)?
4. The line drawn through places of no magnetic variation is known as the _____ line.
5. How many publications are necessary to convert a Polaris observation to Lat.?
6. What is a rhumb line?
7. What is a great circle course?

Note—For more detailed information see the Flight Preparation Series—Air Navigation, Parts I through VII, and the Aerology Series.

(Answers on Page 40)

Scientists Have Special Board

To Handle Washington Area Activities

Scientists in aviation and other branches of the Navy will be selected for their positions after being examined by a newly-created Board of Civil Service Examiners for Scientific and Technical Personnel.

The board consists of five senior scientists representing the five major Naval research laboratories—Naval Ordnance Lab, Naval Research Lab, David Taylor model basin, Naval Gun Factory, and Naval Medical Research Institute.

Mission of the board is to recruit, examine and evaluate applicants for scientific and technical positions in Naval activities in the Washington, D. C., area. It is the first board of its kind to be established and will function under a delegation of authority by Civil Service Commission.

NATS MYSTERY OF THE FLYING SHORT CIRCUIT

Fifty minutes out of Bermuda on course to Patuxent, Lt. V. F. Van Hoomissen glanced out of the window of his big NATS transport in search of a reported ship. Instead of the expected view of sea and sky, he was greeted by a searing explosion of light.

His immediate reaction was, "Lightning!"

Before his copilot, Lt. C. G. Rogers, and his passengers could get used to the idea, the R5D-3 was struck four times. All within half an hour.

When a second explosion followed soon after the first, the pilots climbed from 4000 to 8000 ft. This took them from beneath a ragged and murky overcast to an altitude where they occasionally encountered the tops of clouds. No sooner had they settled to reduced cruising speed than a third and fourth explosion rocked the plane. The last one blinded the pilots and nearly knocked the VR-1 transport out of control.

Capt. E. Grant, who was standing behind the pilots at the time, was emphatic in his praise of the crew for their reactions under emergency conditions. "The lightning," said he, "caused deafening explosions in the vicinity of the nose, blinded the pilots and created a burning smell in the cockpit. I have been flying for 17 years and have never experienced anything comparable.

"I had the distinct impression that the plane was on fire and out of control. The speed had dropped to about 125 and the plane was in a climbing turn. The pilots regained control, the radioman was ready to send his SOS and all crew members conducted themselves in a commendable manner."

All of the flashes traveled back the port side. Van Hoomissen described the last as having "light red edges with the center blue-white. The sound was a definite boom. No crackle. Plane shuddered. I slowed airspeed to 140 mph. and ordered crew to search for fire. The smell of ozone burning filled the cockpit." Since the occurrences resembled explosions, the pilot logically suspected the cockpit heaters and disconnected them.

After the fourth explosion the pilots boosted altitude to 12,000 ft, proceeding without further incident.

Back in the cabin the passengers had felt the big transport shudder under the shocks and saw the balls of fire flash down the fuselage. They, too, had thought the plane was on fire.

Upon arrival at Patuxent close inspection revealed that nearly one and one-half sq. ft. of the port elevator at the static discharge wick had blown out. A one and one-half inch hole was burned in the bottom of the starboard elevator. Bonding wires throughout the plane were in excellent condition.

Once the full reports of crew and passengers were in, the argument began. Was it static electricity or did lightning strike four times in the same place?

The first two loud reports occurred while flying in light rain, temp. one degree C., IAS 190. No lightning had been seen except at a distance. The third and fourth explosions occurred at an IAS of 160, minus 7 degrees C. and light rime ice and snow. Strangely enough, radio communications had been unusually good during the emergency, indicating that static dischargers were operating efficiently.

Some investigators believed that static charge built up while the aircraft was flying in precipitation. They reasoned that the static charge increases in potential as the temperature decreases and the amount of charge communicated to the airplane increases with its size and with the cube of the plane's speed. At the time of the worst discharge, conditions were favorable to static formation.

Other investigators believed that the plane was passing through fields of charge "variable in intensity and with gradients almost strong enough to ionize the atmosphere." Entering the field, the transport replaced part of the normally high impedance space with a dead space. It "shorted out" high gradients of charge and thereby itself caused the four bolts of lightning.

These gradients also existed somewhat parallel to the line of flight as all the arcs took place between the nose and tail, as seen from the damaged elevators and loop housing. Had the aircraft flown perpendicular to a high gradient, small holes or other damage would probably have been found at the wing tips.

STROKE RAN DOWN PORT SIDE, OUT TAIL

LIGHTNING LEFT WIDE HOLE IN ELEVATOR

Although R5D transports are capable of building up as much as 500,000 volts, this is relatively small when compared to the capacity of cloud-to-cloud or cloud-to-earth lightning. ComNATS-Lant, who conferred with NRL and BuAer, also believed it possible that the transport "triggered" the four strokes and that damage might have been cumulative. Interesting was the

fact that the radioman had just keyed his set on CW at the time of the worst explosion.

Although a pilot should try to evade areas of obvious electrical turbulence, his only hope on entering such a field is that his aircraft doesn't become a shorting-bar. Poor bonding, also, will cause internal arcs, multiplying the danger of fire.

Precautions which should be taken to avoid or lessen danger from such occurrences, outlined in the NACA's T. N. #1001, were cited by BuAer.

1. Avoid flight through or near towering cumulus or cumulo-nimbus clouds, especially at levels where the temperature is from −10° F to 40° F. It is preferable to keep at least 2,500 feet away from such clouds.

2. Avoid flight through moderate or heavy rain and/or snow, sleet, hail or ice crystals, particularly if from cumuliform clouds.

3. Reduce speed if in precipitation.

4. If you know the terrain, seek a lower level where temperatures are more than 40°.

5. If the aircraft has a trailing wire antenna or tow target cable out, reel it in.

BuAer has a comprehensive research program to investigate lightning hazards to aircraft and the best means of protection. It is being conducted at a special research hangar at NAS Minneapolis, using a 5,000,000-volt artificial lightning generator. (NANews, February, 1946, p. 23)

Trinidad Entertains the Fleet

Station Makes Its Facilities Available

NAS Trinidad—Getting the air station ready to receive the Fleet when it was in the Caribbean recently on maneuvers took a lot of work and planning that does not always show.

The Ship's Service, for instance, got in a big stock of articles from neighboring countries and islands, as well as locally-manufactured souvenirs, to meet the demand.

The excellent facilities for athletics and recreation on the station were set in order and a well-rounded recreation schedule planned for all hands. The Aviation Petty Officers' Club opened its doors to petty officers of the Fleet. An evening of calypso songs and rhumba dances highlighted the Commissioned Officers' Mess program.

ADMIRALS BLANDY, CASSADY ON LANDING

It's the Leyte's *turn for a Mediterranean assignment. The* Leyte, *one of America's newest* Essex-*class flattops, is scheduled to head the Fleet that will conduct training games in the Mediterranean this spring. It is anticipated that the* Leyte *will visit Gibraltar, Naples, Crete, Istanbul and Alexandria during her training cruise in European waters. Previously, the* Roosevelt *and* Randolph *have visited the Mediterranean.*

Fleet planes landed at NAF Waller Field, except for three planes from the *Missouri* which moored at the seaplane ramp. Main scene of athletics was at Rainbow Canteen, Scotland Bay, which can handle 4,000 persons. The beach has three floats, diving tower and a mile of swimming beach. Barbecue pits are protected against the weather and there is a baseball diamond, tennis courts, softball fields, badminton courts, horseshoe pits, boxing ring, 12 punching bags, basketball court and complete gear locker.

HORSESHOE PIT IS POPULAR AT TRINIDAD

Adjacent to the softball diamond is Knox Zoo with its displays of reptiles, birds and animals of the island, a majority of them captured on the base.

Wire Records Anti-Sub Operation

Analysis of Training Problem Is Made

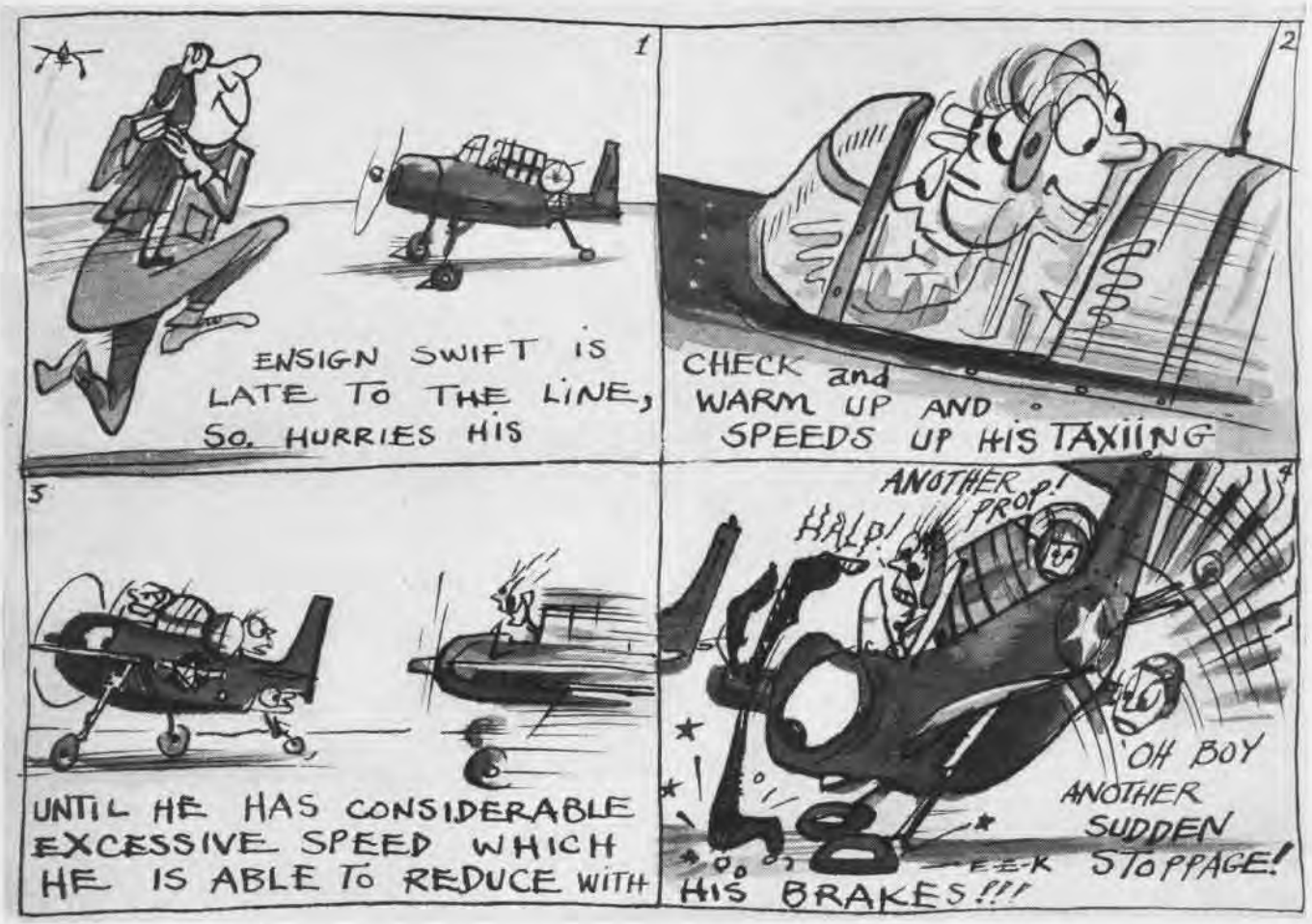
VP-MS-2—A record library of wire recordings made while flying PBM's on ASW sonobuoy flights, has been established by this command at NAS San Diego.

Upon completion of each ASW flight, the wire recording is played back in the presence of the crew and ASW training officer for comment, instruction and recapitulation. A collection of various type problems will be made under actual operating conditions for reference in future training. Interphone communication is included on these recordings, review crew voice procedure.

Calling All Historians

During the war, when an historical unit was created in DCNO (Air), it found itself constantly having trouble in going back to pre-war days to find the origins of things. To avoid such a condition in the future and to provide for continuing historical coverage, ACL 22-46 and 71-46 were issued requiring all ships, stations and units concerned with Naval aircraft to submit quarterly historical reports.

Many units, notably ships, have not submitted histories, apparently through confusion as to their requirements. Because these reports form the sole continuous narratives in which achievements and other events are recorded and in which the units can set down what they want to have remembered, all are urged to have them prepared and submitted regularly. Instruction may be found in the *Manual for Historical Officers*, NavAer 00-25Q-26.



ENS. TOO SWIFT.

Moral: Taxi Slowly and Carefully!

An analysis of taxi accidents shows that nearly all of them are caused by neglect of the simple safety precautions taught the pilot from the beginning of his flight training. This carelessness may be the outgrowth of bad habits or it may result from a temporary lapse of safety consciousness. In the event you fall victim to either of these you will get into trouble as is clearly illustrated in the case histories presented below.

To keep out of trouble and help eliminate or reduce this type of accident, you must taxi at a safe speed, clear taxi tract visually (S turn in single-engine planes), use brakes intelligently, respond properly to taxi signals, and be constantly alert for hazards along the taxi route. For more detailed information on taxiing read and understand *Flight Safety Bulletin* #16-45. For thorough knowledge and understanding of day and night Standard Aircraft Taxi Signals read and review the *Taxi Sense* pamphlet.

CASE I A TBM pilot received taxi instructions from the control tower and proceeded to the take-off runway. Prior to reaching the take-off runway he noticed his right wing lowering. He applied right brake as a corrective action; this action proved ineffective, so he applied both brakes to bring the plane to a stop and because he was using excessive taxiing speed the plane skidded and nosed up. This resulted in sudden engine stoppage and prop damage.

CASE II An F6F pilot made a successful carrier approach and landing. The pilot then came out of the arresting gear in a normal manner. After passing the barriers, he misinterpreted the plane director's slow down signal for emergency stop and applied full brake causing the plane to "nose-up." Net result—bent propeller, sudden stoppage to engine, and bent speed ring.

CASE III A JRF pilot left the parking area on an authorized familiarization flight. While taxiing to the take-off runway, he decided that the brakes were not working efficiently and he requested permission from the control tower to return to the parking area. Permission to do so was granted by the control tower and the plane returned to the parking area. Upon reaching the parking area the pilot attempted to turn and taxi between two columns of aircraft. The turn was started to the right and the pilot was unable to stop the turn with brakes or engines. This inability to stop resulted in a collision with a parked JD-1 aircraft. Brakes were checked a few minutes after the collision and worked well enough to have averted this accident.

CASE IV An F6F pilot in the Organized Reserve departed on a rocket firing practice flight. Upon completion of the firing runs the flight returned to the field. The pilot made a successful landing and made a right turn off at the end of the runway. The pilot taxied down the taxi-way for 275 ft. at an excessive rate of speed at which time he saw an F6F (which had been stopped on the taxi-way so that the ordnance gang could unload a fouled rocket), to the left and 10′ away. He applied brakes but hit a parked plane.

RED TAPE is the inevitable bugaboo of every large organization, military or civilian. Given enough of the stuff, an organization will strangle itself or at least its efficiency.

Realizing that, the Navy's air planners at war's end established a unit designed to smooth out and speed up relations between field activities and Washington headquarters. Unofficially, officers comprising the unit call themselves legmen for the Navy's aeronautical service.

The admiral, who as special assistant to the Deputy Chief of Naval Operations for Air has headed the unit since its inception, describes his activity as "Washington representative of the people in the field and spotter of incipient disorder for DCNO (Air)."

A handful of senior air officers, qualified in administrative procedure but young enough to be completely familiar with and sympathetic to squadron and air group problems, make up this tape cutting organization. During the past year they visited virtually every naval air activity in continental United States, the Caribbean and Pacific areas.

Field Trips Bring Real Results

Those trips have been highly productive both for the field stations visited and for the Navy Department. Here's an example of how their work pays off. One officer, when he visited Cecil Field, found local personnel needed a commissary store. Curtailed bus transportation to Jacksonville and lack of store facilities locally made shopping an all-day chore. Formal requests seemed hopelessly tangled in red tape. Station morale, reflected from the wives in the kitchens, threatened to slip and slip badly.

Back in Washington a few days later, the officer reported the situation. A few telephone calls to the right places by the right people cut the tangled tape and a commissary store was authorized.

When a DCNO (Air) field survey officer comes aboard a station he immediately sits down with the senior officer present for a full discussion of local problems. Then he begins a firsthand study of the situation. Being able to talk the flyer's language helps.

To get all the facts these aeronautical legmen cover a lot of ground and talk to a lot of people, enlisted men as well as commissioned officers. In an average month field survey officers visit a dozen different activities.

After every trip they come back laden with requests. Cognizant desks in BUAER and DCNO (Air) are contacted and problems dissolve or are forestalled before they've had time to become troublesome. Sometimes the problem is as simple as checking an unanswered request on a personnel matter. It's all part of the aviation troubleshooter's duties in keeping BUAER and DCNO (Air) informed and forwarned. The fundamental purpose is preventive. It's all a matter of getting the information quickly and correctly and getting it to the right places at the right time.

It soon became apparent to field survey officers that a comprehensive study of instrument flying proficiency and instruction was needed. They immediately established an instrument flight standardization board consisting of three highly qualified naval aviators to make the study.

TO COMPILE a statistically accurate picture of the overall instrument flying situation, it was necessary for board members to visit 31 different naval aviation activities in the United States and Hawaii. On each station they flight checked a representative group of instrument rated pilots.

At the end of seven months they had the complete picture, and it was an alarming one. Many Naval aviators were unfamiliar with ACL 19-44, the Navy Bible on instrument flight qualifications and requirements. Others were not logging the required three hours of actual or simulated instrument time per quarter. Too many aviators were deficient in minor phases of procedure.

Instrument Flight Situation Improved

In the course of their survey, board pilots weren't too busy to give the field activities a hand in writing standard syllabi for instrument flight training. Standard forms for instrument rating flight checks were left with each station. Assistance along these lines is still available on request through CNO (OP-55T).

The overall instrument flight situation began improving immediately. Today every Fleet and Field command has an instrument flight standardization board working on the problem. With the development of ground controlled approach and other new techniques, instrument proficiency is imperative. There's no place in modern day naval aviation for pilots who are not proficient in their instrument work.

THE INSTRUMENT flight story is just one of many examples of the work being done by DCNO (Air)'s field survey officers. They spot a problem, they study it and, when they have all the facts, they move to correct it. That's their mission.

Reports on every field trip are filed for ready use. Needless to say they provide fodder for frequent discussions and are a constant and valued source of information to the front office planners. The unit also supplies technical assistance on aviation matters to the Naval Inspector General's Office but is in no way a part of that organization.

RESERVE STATIONS EMPHASIZING FLIGHT SAFETY

FOUR RESERVE PILOTS AT NAS ANACOSTIA PLAN ROUTE FOR THE DAY'S PROJECTED FLIGHT

WHEN A MAN plays golf for a living, each shot is carefully planned and executed. The golfer plays to the best of his ability every round. But let the man who makes his living in a more conventional manner play weekend golf and see what happens. To him the game is merely a form of self-expression, a sort of pop-off valve —let the golf balls fall where they may.

The same parallel too often can be drawn between the Naval aviator who makes his living flying, and the Reserve pilot who flies only once or twice a month. It seems that for a certain few returning Reserve pilots, weekend flying acts as a release.

All previously retarded inhibitions and impulses come storming to the fore and flight safety regulations merely present a heady challenge. It is "heigh and make merrie today, and tomorrow back to the mahogany desk"; but too often, tomorrow is spent in a mahogany box—for flying remains a serious game whether practised full-time or part-time.

This loose attitude on the part of a few Reserve pilots results in violations, violations result in accidents and a "tightening up" on all pilots by Commanding officers. When reports come in like this, "One fatal accident occurred when the pilot of an SNJ crashed while engaged in low flying outside his assigned area" and this, "Two pilots were killed when a slow-roll was attempted at very low altitude"; then reports go out like this: "During the period from 15 October, 1946 to 19 November, 1946, the Naval Aviator Disposition Board disenrolled and revoked the wings of eight Naval aviators.

"One pilot's classification was changed from flight officer to ground officer and three Naval aviators were placed on probation for periods of from six months to one year"—all for violations of flight rules.

If you wish to see why this "tightening up", read: "The overall accident rate of 9.80 accidents per 10,000 flight hours for December, 1946 shows a gratifying decrease in comparison with the 21.40 accidents per 10,000 hours for the previous month."

Excerpts from station newsletters for February follow:

● NAS NEW ORLEANS—The remainder of the fiscal year has been divided into seven 2-week periods for training duty for the Organized Reserve, commencing 23 March. A large percentage of the officers have applied for definite periods of training duty, but the uncertainty of obtaining leave from their jobs has so far prevented a fair percentage of the enlisted men from committing themselves.

● NAS JACKSONVILLE—One of the winners of a free plane ride at *Operations Reunion* was John W. Hastings, 80, who had never ridden in an airplane. Upon his return, Mr. Hastings expressed a desire to enlist in the Naval Air Reserve as a Seaman. Unfortunately, due to the age restrictions, the Recruiting Officer was unable to accept his enlistment.

● NAS OAKLAND—This station became the first of the 22 stations of the Naval Air Reserve Command to hold a two-week active duty period for officers and men. A survey taken the previous month had indicated that the dates from 6 to 20 February would be the most popular, since schools were not in session at that time. About 200 officers and men participated in the program of flying and ground training. Pilots flew an average of 37.1 hours during the two-week period. There were no personnel injuries and only one plane seriously damaged.

● NAS SQUANTUM—With the arrival of the

SIGNING YELLOW SHEET BEFORE TAKE-OFF APPLIES TO RESERVE AND REGULAR ALIKE

GCA personnel and activation of the Unit, considerable publicity will be received. Aviation editors of the Boston papers are expressing an early interest and articles are now being planned for news releases.

● NAS SEATTLE—A surprising amount of interest in the Reserve program has been discovered in the 30- to 40-year age bracket. Following an assembly at a vocational school, two teachers expressed their desire to enlist as A.S. Their reason was that the boys would get ahead of them through the training they would receive on new and expensive equipment to which the school would never have access. One team was making a call in answer to a letter from a 17-year-old boy. It was discovered that his 17th birthday was a month off but his father was sworn in, and in a month both father and son will be A.S. in the same squadron.

● NAS MINNEAPOLIS—A volunteer WAVE unit is in the process of organization on the base. Enthusiasm is running high among ex-WAVES. Two hundred girls attended a meeting Thursday, February 27th and twenty-three were signed into V-10. It was impossible to process more that evening. A plan of training is being formulated for the ex-WAVES and they have been encouraged to volunteer their services at the base. Twelve girls are volunteering their weekends to work with Link trainers. Additional girls are working in operations and twenty have volunteered for duty with the VR Squadrons as orderlies on scheduled hops. Many of the girls are planning to take advantage of the two weeks active duty period this summer.

● NAS ST. LOUIS—Excellent publicity was obtained from the offer to the general public to come out to *Operations Reunion* and take a war souvenir off of a Japanese carrier-based plane. The hulk of the plane was spotted in the hangar and a few surveyed hammers left lying about. The visitors turned to and reduced the fuselage of the plane to a skeleton. All newspapers used this angle for a lead line on post *Operations Reunion* stories.

● NAS MIAMI—Interest in the local Naval Air Reserve program has suddenly increased to a marked degree, whether due to the numerous publicity angles tried by this activity or the fact that more people need extra money these days is not known. The Commanding Officer has declared all rolling stock available to any station personnel for the purpose of recruiting Reservists.

● NAS DENVER—This station is going through all the trials and tribulations of a newly-formed unit. Though all efforts have been somewhat hampered by the scarcity of office supplies and personnel, things are shaping up. One hundred thirty-five qualified pilot applicants were interviewed for CVEG-53 and the complement was filled within rank structure, with the exception of nine ground officer billets. Those pilots not selected for the Air Group were put on an Associated Volunteer Status, and as soon as possible, request for orders will be submitted to assign these men as Associated Volunteers with CVEG-53.

● NAS ATLANTA—Rear Admiral Ewen, while on an inspection tour of this station, appeared on two 15-minute radio programs. He featured the Valentine Day program on Enid Day's Davison's hour, the oldest and best program on WSB. His vivid and colorful description of the Naval Air Reserve Program earned for him the title of the best radio personality ever to appear in the WSB studio.

Two aircraft accidents occurred during the month, one on the station and one in the area east of the field. There were no injuries to personnel.

● NAS OLATHE—The recruiting bus has now been operating three weeks in Kansas City, Missouri and Kansas City, Kansas, and is now working the small towns in an area within a 50-mile radius of the station. Results to date have shown that the drive for recruits in this manner is very effective.

● NAS LOS ALAMITOS—Recruiting is under way full speed. Close liaison is maintained with 11th Naval District Recruiting Offices and forces are joined to cover various activities in this area. The District Mobile Recruiting Unit came aboard for *Operations Reunion* and had a successful day bringing in V-6 inactives.

● NAS NORFOLK—An all-time high was reached when our pilots flew a total of 892.7 hours for the month of February. Air Group 60-E continued to be the "Endurance Boys" piling up the greatest number of hours flown per pilot. The group had an average of 7.8 hours per pilot, with the VF squadron leading with 8.1 hours per man.

● NAS GROSSE ILE—The Transportation Department, beset with the virtually impossible task of operating its vehicles within the Station maintenance fund, has had its problems solved by an alert Supply Officer, who utilized the provisions of Public Law 627 of the 79th Congress and AlNav 444. The statute authorizes the transfer of government-owned surpluses from one government activity to another without the transfer of funds, and when Fort Wayne, a Detroit Army post, closed recently a tremendous amount of auto and truck parts which had been declared by the Army to WAA was appropriated. It was necessary to have included in the parts received some items which were not in use on this station, but these parts were in turn transferred to other government activities which had need for such pieces.

● NAS GLENVIEW—A battery of tests in the various rates were administered the Organized Reserve on their drill periods through the month of February. These pointed to the fact that because of necessary specialties created due to emergency expansion, very few men know their rate under peacetime standards. On the basis of what was learned from these tests, enlisted training is placing these men in classes covering their weak points to bring them up to the standard required of them in their respective rates.

VETERAN OF TWO WORLD WARS, LLOYD L. OWENS TAKES FIRST PLANE RIDE WITH HIS SON

● NAS MEMPHIS—Peacetime training with Army, Navy, and Marines participating got under way in a joint operation on 2 February wherein Brandywine Island—in the Mississippi river near Memphis—was the scene of action. Although the outcome of the simulated battle is still in doubt, one point was clearly demonstrated: Much was accomplished for training purposes.

● NAS SAN DIEGO—Official word has been received from Chief of Naval Operations that this reserve unit is to be deactivated. All training was cancelled as of 16 February and the Squadrons were transferred to NAS LOS ALAMITOS.

● NAS ANACOSTIA—Reports covering manhours of instruction for the month of February 1947, show a satisfactory increase due to the change in drill periods from two separate days a month to one complete week-end for each squadron. Because of this increase and other working advantages it is recommended that this program be continued in the future.

ARMY, NAVY SUPPORT AERONAUTICAL BOARD

When the Army announces adoption of the knot in air navigation—or when the Navy discloses that Army, Navy and civilian agencies are cooperating to achieve all-weather flying at the Landing Aids Experiment Station, Arcata, Calif.—readers often wonder what machinery has brought about these joint enterprises.

Actually, such activities are not the result of chance. Since 1916 the air organizations of the Army and Navy have supported the Aeronautical Board, whose function is to coordinate and standardize aeronautical matters for both services.

Reorganized several times after its inception, the Board has always covered the entire joint aeronautical field. Originally, it was organized to study the development of an airship service.

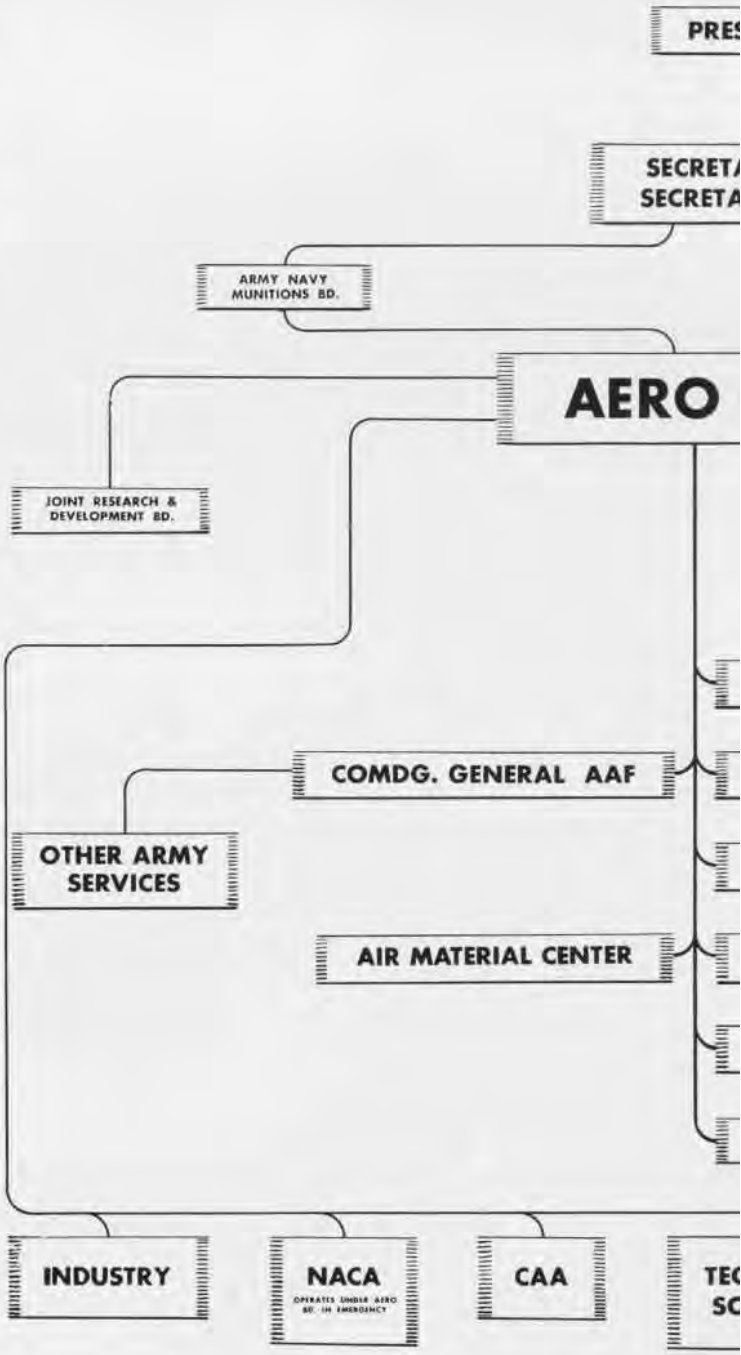
Gradually its area of study broadened to determination of general policy. Through the years it progressed to programs and budgets, cross procurement, supply and maintenance problems, plants cognizance, the standardization program and joint development of specialized equipment.

The Aeronautical Board was placed under the direction and supervision of the President in a military order signed by the President as Commander-in-Chief in July 1939. During the war its functions were largely performed by several committee structures consisting of the Joint Aircraft Committee, which included United Kingdom representation, Munitions Assignment Committee, Conservation Committee (ARCO), Aircraft Scheduling Unit, Aircraft Production Board and the Standardization Committee of the Board.

At the end of the war in 1945 the Aeronautical Board was reorganized for peacetime planning, substituting approximately 90 committees and sub-committees for the 300 formerly operating under the Joint Aircraft Committee and other major coordinating organizations.

The board studies and reports upon all aeronautical matters referred to it by the Secretaries of War and Navy, the Commanding General, AAF, DCNO(Air) or the Chief of BuAer. It also initiates studies of any such matters as it deems necessary.

Decisions of the Board are forwarded to the cognizant service in the form of Aeronautical Board directives. All recommendations affecting joint Army and Navy policies or plans relative to national defense are referred to the Joint Chiefs of Staff for consideration before submission to the Secretaries of War and Navy for action.

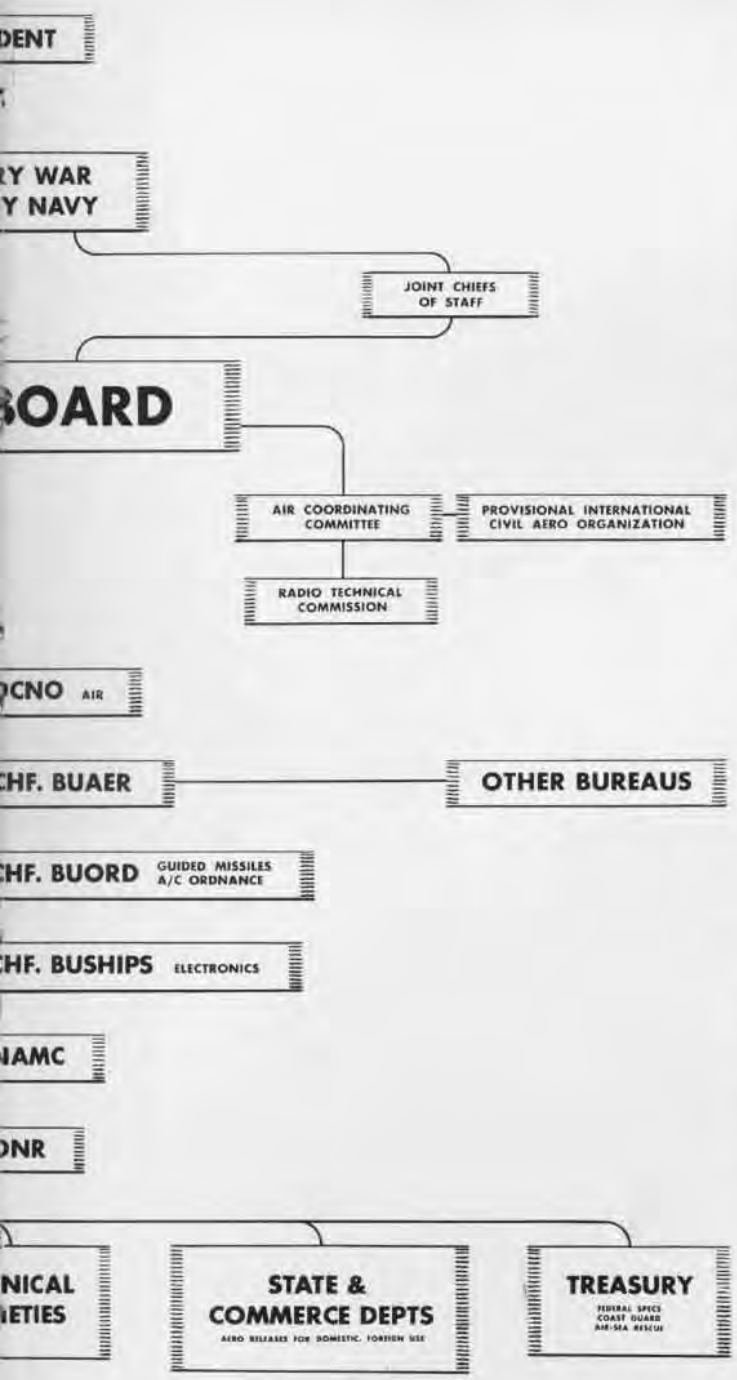


Matters affecting the procurement of material in time of war are submitted to the Army and Navy Munitions Board.

Eight main supporting committees assist the Aeronautical Board in performing its functions. These committees cover Plans and Policies, Research and Development, the Production program, Aircraft Radio and Electronics, Aircraft Ordnance and Armament, Supply and Maintenance Requirements, the Army-Navy-Civil Committee on Aircraft Design Criteria and the Working Committee.

Work done by the Production Program Committee and the former Industrial Planning Committee furnishes a good example of the elimination of duplication and expense in the production of aircraft and aeronautical material.

During the war both services used Pratt-Whitney and Wright engines. Rather than duplicate inspection and con-



tract relations the Army and Navy set up a system of cross-procurement wherein the entire output of Pratt-Whitney were procured by the Navy and that of Wright by the Army. This coordination saved both time and money.

The Working Committee performs all administrative duties connected with the Board and its committees and acts as the coordinating agency in the standardization program. Its senior Army and Navy members are the Secretariat of the Board.

THE Army Air Forces and the Bureau of Aeronautics realized long ago the need for standardization of equipment, materials, designs and processes. Though there were two air services, there was only one aviation industry which would be burdened with troublesome and expensive problems if working to two sets of standards.

Approximately two-thirds of the standardization effort is expended in maintaining existing standards and one-third on the issuance of new standards. That the standardization program is not complete is illustrated by the fact that a recently designed Navy fighter contains 370 types of screws of which 130 are manufacturers' standard and the remainder AN standards.

The war expedited the standardization program and there are now many Army-Navy Aeronautical Standards in effect. They number 773 specifications, 1248 drawings and 190 bulletins. There are over 800 projects in the proposed and coordination stage. Use of existing ANA standards is mandatory in the procurement of aircraft accessories, spares, parts or materials.

THE Strauss-Draper Report, a recent impartial survey by Army-Navy personnel, was highly complimentary of the board's work to date. All personnel on the Working Committee have been admirably non-partisan in the standardization program. Frequently Army personnel will support BuAer in a conference called to settle some controversy, or a Navy member will support the Air Material Command of the Army Air Force.

Some of the other government organizations and agencies with which the Board cooperates are the boards of Joint Research and Development, Army and Navy Munitions, Joint Communications, Army Navy Petroleum, Army-Navy Joint Specifications, Federal Specifications, the National Advisory Committee for Aeronautics, the Civil Aeronautics Administration, ONR, Navy Bureaus and Army Services.

In addition the Board works closely with non-government agencies such as aircraft manufacturing and technical societies, in connection with the standardization program.

Recent estimates indicate a large amount of economy has been obtained through Aeronautical Board activities.

While it is realized that operational results rather than financial economy is the governing feature in any aeronautical program, the savings in civilian and government economy due to closer practical coordination and standardization must always be given due weight.

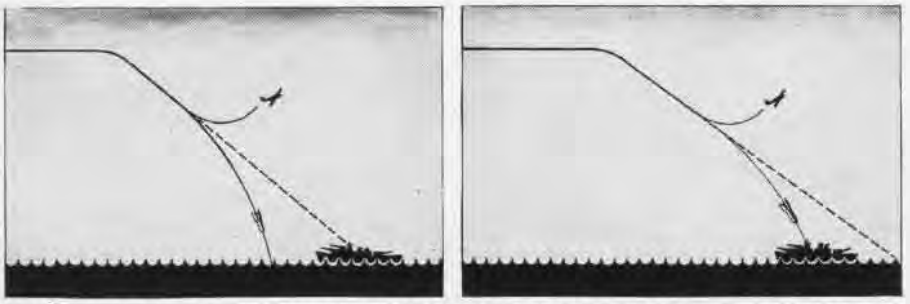
The Aeronautical Board structure is considered suitable for expansion to a combined Board to include Allied representation in time of war and it might readily be used as a pattern for other line product organizations.

The Aviation History Unit, OP-50-D under the Chief of Naval Operations, has recently compiled and written a complete history of the Aeronautical Board from its inception in 1916 to its status at the end of 1946.

To be printed and published at a later date by the Government Printing Office in Washington, D. C., the history will describe in detail the origins of the Board, its committees and accomplishments. Its appendices will include copies of basic documents and will list all cases studied.

BOARD SPONSORS JOINT EXPERIMENTS IN ALL-WEATHER FLYING ▶

TOSS BOMB DIRECTOR EASES SIGHTING PROBLEMS



CHARTS SHOW GRAVITY EFFECT IN NORMAL BOMBING, HOW PILOT AIMS 'OVER' FOR HIT

SPECTATORS at recent air shows throughout the United States have seen the wraps taken off the Navy's relatively new technique of toss bombing. Navy fighters and bombers, making demonstration runs, have showed high accuracy in bombing small targets.

To witnesses of these bombing runs, the amazing thing has not been the accuracy, but rather the method of bombing. By literally throwing their bombs or rockets at a target, aircraft have been able to release at greater altitudes and ranges than ever were possible in ordinary dive bombing.

In toss bombing, the bomb is automatically released during pull out. This toss compensates for the effect of gravity and air resistance which, in ordinary dive and glide bombing, cause a bomb to fall short.

Easy aiming and increased accuracy are not the only advantages, however. Short, high speed bombing runs and long range drops keep the pilot out of short range AA fire. He is a target of long range AA for a much shorter period of time.

Use of this technique completely eliminates memorized sighting allowances and strict adherence to dive angle, speed and release point required in conventional dive and glide bombing. The only requirement on the pilot's part is to be able to dive an airplane and line up the target in the sight.

The Bomb Director, MARK I Mod 2-AN/ASCIOA, does all the work. An electric computer in the bomb director reduces the "human element" to achieve greater accuracy. The computer automatically releases the bomb at exactly the right instant during pull out to score a hit.

The bomb director takes into consideration the distance from plane to target, velocity of the plane, angle of dive, number of G's exerted in the pull-out and the ballistic coefficient of the bomb. With the exception of a few settings before take-off, all of this information is obtained automatically.

Upward velocity needed to toss the bomb to the target is calculated from this information by the computer. Variations in the rate of pull-out are taken also into account.

The pilot's only concern is to pull out so that from two to six G's are exerted. The bomb is given an upward and forward velocity or toss which causes it to stay above the plane's flight path toward the target.

Force of gravity and air resistance bring the bomb back to the original flight path at its intersection with the target. This is illustrated in the diagram below.

When the bomb director has made its computations, an indicator lamp goes on in the cockpit. This tells the pilot that he may make his pull-out immediately, or at any time farther in the dive.

ACTUAL sighting runs, during which the computer solves its problem, take a maximum of six seconds. In most cases the runs are considerably shorter. An added advantage is that time required for computation is reduced when attacks are initiated closer to a target.

Under ideal conditions, pilots need only to line their sights on a collision course with a target, press the bomb release switch and pull out sharply after the indicator lamp goes on. The bomb director does the rest.

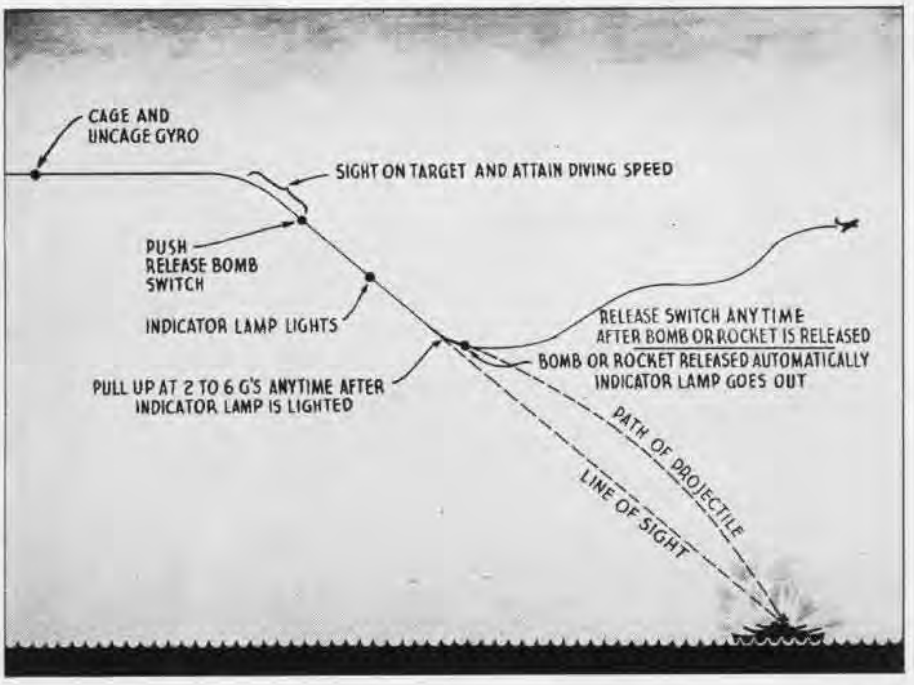
The director works equally well with rockets, and latest models permit the pilot to select bombs or rockets by the flick of a switch.

Designed to increase accuracy and safety for fighter bombers, the equipment works equally well in dive and torpedo bombers. Helldivers and Avengers can make "clean" fast dives and glides recovering well out of range before enemy AA can track and fire.

In toss bombing all problems are eliminated except allowances for wind and target motion which must be made by the pilot. The technique permits varied approaches and actual releases from as high as 8,600 ft.

Practically any maneuver may be used to enter a dive except a "split-S" or a steep bank which would tumble the dive angle gyro. Dives may be made at any angle between 15° and 70°.

When steady on target the pilot initiates computer action by pressing the bomb release button and holding. Altitude and angle of dive are automatically measured by an altimeter and gyro which feed this information to the computer. When the plane has traveled approximately one-sixth the slant range



to the target, the computer has made all necessary computations.

The indicator lamp in the cockpit then lights up and the pilot may pull out any time. However, he must hold down the bomb release button until his bombs are released, as signified when the indicator lamp goes out.

If flak or bumpy air causes the aim to get off target, release of the bomb button will prevent the bomb from dropping and reset the director for another run. This new run may be started immediately without pulling out.

The range from which bombs may be dropped is dependent upon the speed of the airplane. High speed

TOSS BOMB DIRECTOR IS LIGHT, COMPACT

planes can operate at long ranges and shallow angles since they can give a bomb a greater toss than slower planes.

Slower planes must shorten the range either by lowering the release altitude, or if high altitude releases are desired, by using steep dive angles.

Release of the bomb would occur at an altitude slightly lower than five-sixths the altitude given if pull-out were made as soon as the indicator lamp came on. Operations above the maximum listed altitude will cause 'shorts.'

Although the Navy is significantly cautious in making claims for toss bombing, the new system may well change the course and tactics of naval warfare. Too many combat reports tell of pilots diving to dangerous altitudes in order to get hits on well-armed targets.

NAS JACKSONVILLE—Beneficial suggestions made by air station employees during 1946, it is estimated, will result in an annual saving of $776,568. A total of $11,624 was paid to 206 air station employees during 1946 under the Beneficial Suggestion program.

MCAS EL TORO—Here's how Headquarters Squadron Marine Air Control Group Two describes its Maintenance Officer: ". . . he wears the uniform of an aviator, but his soul is that of a crusader, and his face around Public Works is as familiar as one of the fixtures."

VR-1—Some inquiring soul dug into the maze of VR-1's paper work and came up with proof that the post war period is upon us:

Pieces Official Correspondence	1945	1946
Received and routed	4,565	3,789
Prepared and mailed out	19,144	2,500

AVIATORS LEARN TO RUN A SHIP

AVIATORS HELP TO NAVIGATE THE CARRIER

FIGHTER pilots watching the ship's engine room gauges or a bomber pilot tracking a target in CIC were no unusual sights during the recent cruise of the U.S.S. *Tarawa* from the Marianas to the Hawaiian Islands.

The carrier was so loaded with cargo that flight operations were impracticable. Members of Attack Carrier Air Group One seized on the made-to-order opportunity to learn how the surface Navy accomplishes its tasks.

Training was divided into two phases —actual watch standing and a lecture training program. Officers stood watches in which they had to keep the ship on station during night operations, decode and route messages, operate CIC, and join the black gang in engineering spaces. Duties were exchanged every four days.

Even the CAG and the squadron CO's came in for their share. They were made assistants to the navigator and spent their time learning how to do a day's work at sea.

One surprised flyer, just off the mid-watch in the engine room, was heard to comment: "There are sure a lot of people working on this ship while we sleep!" General result, however, was to bring officers one step nearer the Navy standard of having every line officer qualified as an officer of the deck.

Officers and enlisted men attended at least one lecture a day on subjects designed to fill in the gaps left during hurried war training. These lectures covered uniform regulations, Naval Justice, Fleet organization, duties of a petty officer and advancement in rating.

Technical lectures explain engineering checks, survival and new technical advancements in the aeronautical field. Division school, held each day, was designed to improve the performance of the line crews mechs, ordnancemen and radiomen. One course even covered English grammar, often overlooked in training programs. Officers taking the Naval Intelligence course squeezed in an hour a day for group discussions.

The "University of the *Tarawa*" is another step forward in the Air Group program to round out the professional knowledge of its officers and men. It stresses "Command Attention" as outlined in BUAERS Circular Letter 11-47.

FIGHTER PILOT WATCHES THE THROTTLE WATCH DEEP DOWN IN TARAWA'S ENGINE ROOM

GENERAL LINE IS MUST DUTY FOR NAVAL AVIATORS

ELECTRICALLY-CONTROLLED, THREE-DIMENSIONAL MODELS ILLUSTRATE WEATHER PHASES

AT THE time the Navy opened the way to Regular Commissions for former Reserve and Temporary officers, equal opportunity between Non-Academy and Academy men was pledged. Nevertheless, discussion continues between transferees, about whether this statement was one of theory, or one of fact.

Promises are easy, especially in Washington, but what is actually being done? Can I, too, become an Admiral? How can the Navy guarantee equal opportunity to the man with the meager educational background if he is in constant and open competition with the highly-qualified and professionally-educated Academy officer? Well, here are a few of the answers—the Navy is paying off.

The Navy has set up a two-part program to bring the former Reserve and Temporary officer up to the professional level of the Academy graduate. First of all, all officers in the Navy with less than five semesters of college work, will be sent to college until they have completed this minimum. Second, all Non-Academy officers will be sent to a concentrated one-year post-graduate school for General Line officers. This includes about 7,000 ground officers and something over 3,000 Naval Aviators.

IF POSSIBLE an officer is placed in a College or University near his home. However, aviators must be placed within range of an air station. After completion of the college training, the officer is eligible for the General Line School. At the present time there is only one Line School, located at Newport, Rhode Island. But plans have been made to establish another school on the west coast, at Monterey, California. Establishment of this school is dependent upon Congressional approval and budgetary limitations; tentative plans have been made to open the school in January, 1948. If only one Line School is operated, the program will take longer, but it will be done! The Navy is committed to this program, it is underway and it includes every officer who has transferred to Regular Navy. If you are wondering why nothing has been done about you as yet, take it easy. This program is projected over seven years, it may take a little time to get to you. But relax, sooner or later, your number will come up and you can pack your bags.

IN ENGINEERING LAB, STUDENTS RECEIVE PRACTICAL INSTRUCTION IN TURBO-GENERATOR

As soon as an officer has finished the five semester college stint, or if he already has that requirement, he is eligible for his one year at the General Line School. Choice of Naval Aviators to attend the Line School is generally based on seniority. Of course, there are other factors, such as availability, present duty, etc., but for the most part, senior officers will attend first.

Student Aviators who will attend the class opening this June, will be composed largely of officers with file numbers lower than 100,000. In some cases, lower ranking officers will attend and higher ranking will not, depending again, upon availability etc. Orders are now going out to officers on sea and foreign duty stations, and most of the officers going should receive their orders in time to make necessary arrangements.

IF YOU are wondering whether five semesters of college work and one year at the General Line School will bring an officer's professional education up to the Academy level—take a look. The five semesters give you approximately 75 hours. The Line School term is approximately 48 weeks. Capt. Moosbrugger, C. O. of the General Line School states that during that time, a total of 1100 class hours are given. That adds up to almost 23 hours a week, or 69 total hours based on three 16-week semesters. This is a pretty fair load, but certainly not overwhelming compared to college standards.

If you count 300 of 1100 hours for practical work, or what might correspond to lab work in college, you wind up with about 50 total hours. Add that to your 75 college hours and you have more than the requirements for a BS degree. The officer is coming out with at least the equal educational background of the Academy graduate. And

that totally disregards all other courses the Navy has already given him such as Flight training, etc., or any of his past practical experience, which certainly must have been worth something to him and the Navy.

Now, the question might arise as to whether the year's work at Line School actually corresponds to Naval Academy work. The present curriculum is patterned after a similar course taught in post-graduate school at Annapolis before the war. From that, you can easily see, it is indeed, a very close parallel to Academy work.

What does the Line course consist of? Approximately one third of the time is spent in practical work; the remainder is spent in instruction periods. (Back to the classroom.) Main courses taught are: Electricity, Ordnance and Gunnery, Strategy and Tactics, Logistics, Seamanship and Navigation, Engineering and Communications.

Naval Aviation, Navy Law, Combat Information Center and Anti-Submarine Warfare, Damage Control, Naval Leadership and Administration, Foundations of National Power, Naval History, Naval Intelligence, Mathematics, Meteorology and Submarines are also included in the syllabus in proportion to their importance.

IT CAN be appreciated from the foregoing that the student officer completing this course need no longer worry about an educational deficiency as compared to his Academy shipmate. He will have the fundamental training that will give him the equality of opportunity necessary to compete with his contemporary in his chosen Naval career. The rest is strictly up to the individual. (Sorry, if you never ride as skipper of the Admiral's barge, it'll be because of you as an individual, not because of the Navy's shortcomings.)

Aviation plays a role of importance in the Line School. Approximately 50% of the officers now attending are Naval Aviators, the rest are ground officers. There are 32 planes attached to the NAS QUONSET, for use of the aviators in the school. They include SNJ, JRB and SNB types. Flights for student pilots are scheduled seven days a week to maintain flight proficiency.

There are many extra-curricular activities in progress at the Line School throughout the year. For the athletic type, there is the gymnasium, swimming pool, bowling alleys, tennis courts and playing fields; enough to suit the most avid physical culturist. For those who prefer less strenuous pleasures—or more ethereal—there is a movie hall, dance floor, various bridge and chess clubs and an excellent club for officers.

NATS PILOT GIVES 'RELUCTANT RONALD' THE GUN TO TAKE OFF FROM ARIZONA LAKE

RAINS RESCUE 'RELUCTANT RONALD'

BALLAUF, PILOT, (RIGHT) AND HIS CREW

"RELUCTANT Ronald," the land-locked PBY-5 which was stranded four months in the Arizona desert waiting for some rain, has been rescued and flown to its original destination, San Diego.

VRF-2 and NAF LITCHFIELD PARK, Ariz., simultaneously reported to NA-NEWS that the rains finally had come. Last October 19, while being ferried west from Philadelphia to Seattle the *Catalina* developed engine trouble and had to make an emergency landing in Lake Carl Pleasant, near Phoenix.

The crew got its first surprise when the plane came in, barely clearing the dam for a landing. The water was so far below them and extended such a short distance, setting down was hazardous. Gunning the engine, they circled the plane to the north and came in over the mudflat, setting down and cutting a sharp circle in the wide part of the lake to lose speed.

The plane was turned over to Litchfield Park for protective custody and engine change. While awaiting installation of a new engine, the lake kept dropping until little more than a puddle remained. Local weather seers predicted it would be February before rain would raise the water level.

Lawrence J. Hickey, Jr., ACMM, stationed at Litchfield, was sent to the lake to stand security watch on the airplane. By special arrangements with the Water Users Association, Hickey and his wife occupied a furnished cottage at the dam. Hickey said the biggest job was scaring off week-end sightseers. Besides being a second honeymoon for him, he reported, it was the best duty he ever had in the Navy and it came 500 miles from any ocean.

On 18 February, Lt. C. Ballauf, attached to VRF-2, a seaplane pilot of 10 years' experience, flew the PBY off, taxiing to the extreme downward end of the lake to utilize the short water take-off area of only 3,500 feet.

In an amazingly short time of 15 seconds the *Catalina* was airborne. Take-off run was estimated at 800 feet, and even the most experienced pilots believed it would take twice that, due to the 2,500-foot altitude of the lake and the light winds.

The plane was stripped of all loose equipment and carried only three persons, Ballauf, Lt. (jg) R. M. Becker and ACMM J. Dore. En route to San Diego, additional engine trouble forced a landing in Salton Sea. Next day parts were flown in and delivery to destination accomplished.

MCAS EL TORO—The station education officer has arranged for Marines to attend evening classes at Santa Ana Junior College. Courses include numerous college and most high school subjects. A special services bus furnishes round trip transport.

VP-MS-3, PACIFIC—Pilots of the squadron have turned teachers. Lectures are given daily on such topics as instruments and instrument flying, submarine characteristics, bombing tactics and anything else a Naval Aviator might be confronted with in line of duty. Officers themselves give the lectures to their mates. AMM's attended a daily class, as did ordnancemen, giving them further training in their rates.

AND THERE I WAS...

Know any good air stories? NAVAL AVIATION NEWS thinks you ought to share that amusing or otherwise interesting yarn about your wartime or peacetime experiences. It does not have to mention names, if you like, but should be a true story and preferably short. Send them to Naval Aviation News, Chief of Naval Operations, Washington 25, D. C.

Famous Last Words

IT WAS the end of a period and the little "Yellow Perils" were flocking back to home base like flies to a raisin pie. The landing mat at the naval air station was small, but as each aviation cadet or instructor conformed to a definite traffic pattern, he soon found enough room to set down. As many as 10 to 15 of the primary trainers were landing at the same time.

One student, out on his first solo, followed the crowd home. But the large number of planes in the traffic pattern had him slightly confused. Head up and locked, he came in cross wind, raising trainers like a hound dog flushing quail.

Everyone from the C.O. in the tower to the mech down on the line covered his eyes and emitted a loud groan. On the third bounce the student regained control and began to taxi in as other trainers buzzed angrily over his head.

Beaming brightly at the thought of completing his first solo into the wild blue, the aviation cadet didn't see the stern-faced duty officer waiting on the line. He had hardly cut the engine, however, when a voice murmured sweetly in his ear, "I suppose you know you landed on the wrong course?"

The student was dumbfounded. "The Hell I did!"

A loud roar brought his attention to the two wide stripes on the duty officer's shoulder and he apologized meekly.

"The Hell I did—Sir."

The Pilot Got Away

Just as the pilot of the Navy TBF was ready to leave Fort Worth for El Paso, a young sailor approached him and requested a lift to the west coast.

"Sure," said the pilot, "got a set of headphones?" The sailor hadn't. "That's OK," the pilot motioned him towards the plane. "If we get in any trouble, I'll open the bomb bay doors and you jump out. Know what I mean?"

The sailor had a fair knowledge of airplanes and he was checked out on what 'open' meant, so the lad nodded affirmatively.

They departed for El Paso, landed there, ate, gassed up again and took off for San Diego. About thirty minutes out of El Paso the pilot checked his cockpit for a map that was a chart of the area. In his search he happened to hit the lever controlling the bomb-bay doors. Almost before the bomb-bay parted to show the stretch of sandy desert beneath it, the pilot had jerked the lever back into a closed position.

The rest of the trip went without mishap and the Navy flier set the torpedo plane down at North Island in a beautiful three-point landing. When he taxied into the line near the control tower, he wasted little time in shutting the engine off and checking out of the plane.

As he climbed out of the forward cockpit, he leaned back into the gunner's turret to see if everything was 4.0 with his passenger. An empty cockpit yawned at him. "Hell's bells," he shouted, suddenly remembering his clumsy error over the Painted Desert, "that guy jumped when the doors opened." Without further ado he reported the loss of "one passenger and parachute." He didn't know what else to do.

Two days later a bleary-eyed, rather disillusioned figure in a blue close-fitting suit wandered into a small town in Arizona cussing, with what strength he had left, these xanjk%—Navy pilots and their practical jokes.

Out of the Frying Pan

A CARRIER air group had just finished a devastating attack upon the island of Kwajalein and was headed back to base. The last division to leave the area, a trio of *Hellcats*, spotted a *Zeke*, probably a refugee from Roi.

Since they had been on a strafing mission, one of the *Hellcats* had 50 rounds of ammo left in each gun and another had only one gun firing. The pilot of the third was kicking his gun charging buttons less in hope than in malice.

The first run did not down the *Zeke* and the three gunless F6F's chased the terrified Jap 30 miles around the rim of the lagoon before leaving for home. The last they saw of him, the *Zeke* was dragging the field on Kwajalein. Day-long attacks had left the field so badly pitted that a sea gull couldn't have landed without ground-looping—which made the Jap No. 4 in the most frustrated quartet of pilots in the Marshall islands at that moment.

VMF-513—Three officers and 43 enlisted men went out to sea on a carrier to prepare for pilot's carrier qualifications but they got only disappointment. Bad weather "grounded" them the whole time they were out.—*Flight Jacket.*

MCAS EL TORO—Here's how Headquarters Squadron Marine Air Control Group Two describes its Maintenance Officer: ". . . he wears the uniform of an aviator, but his soul is that of a crusader, and his face around Public Works is as familiar as one of the fixtures.

TECHNICALLY SPEAKING

FOOTING THE BILL FOR CORROSION

LACK OF care in engine preservation is costing $3,003.00 per day. Faulty engine preservation is removing from service two and three-quarters airplane engines every day. Corrosion of aircraft takes a heavy toll, but the many ways in which there is an actual dollars-and-cents loss are not readily apparent and consequently are not realized. One such obscure way is in the cost of lost engine operating time caused by engine corrosion.

This cost has become so great and the situation so serious that a study has been conducted to determine the monetary value of aircraft engine operating time lost because corrosion necessitated premature overhaul.

Results of this study, in terms of dollars and cents, will be published quarterly. The first report of this series, presented in tabulated form below, covers the period from 1 July 1946 through 30 September 1946. In this three months' period the total monetary loss because of engine corrosion came to $270,255.07. The report is itemized according to engine models as they have been listed in Column 1.

Column 2 represents the number of engines of each model overhauled because of corrosion during the third quarter of 1946.

Column 3 represents the total number of operating hours lost for each model during this period. This was computed by subtracting the average number of operating hours accumulated between overhauls on engines turned in because of corrosion from the average number of operating hours accumulated between overhauls on previously overhauled engines turned in because of high time or any discrepancy other than corrosion. In the case of models R1830-94, R2800-18W and R2800-22, 34(W) engines, the subtraction was made from the average number of hours accumulated on new engines not previously overhauled.

Column 4 represents the average cost per hour of operating time in terms of cost of overhaul of each engine model. This was determined by dividing the estimated cost of overhauling each model by the average number of operating hours accumulated between overhauls on engines turned in for reasons other than corrosion.

Column 5 represents the value in terms of cost of overhaul for operating time lost because engine corrosion necessitated premature overhaul.

The seriousness of this premature engine overhaul brought about by conditions of corrosion is further emphasized when it is remembered that the figure of $270,255.07 is computed for engine operating time lost *between* overhaul periods and does not include time and cost for shipping, engine changing, handling, crating, etc. This $270,255.07 is attributable to engine corrosion only. It represents a total loss—an irreparable loss—and is in addition to the usual maintenance and periodic inspection costs.

These figures show that the 256 engines lost 210 hours each from their normal operating time.

What is the reason for this $270,255.07 monetary loss and the 53,982 engine operating hours lost? At this rate engine corrosion is costing over a million dollars annually.

Reports indicate that the Bureau of Aeronautics has made satisfactory progress in developing anti-corrosive measures and in issuing service instructions for their application. Evidence is at hand to support these reports. Yet the serious losses resulting from lack of care in proper engine preservation continue ever present.

The cause is but one thing—LACK OF CARE.

No matter how good a process may be, the success of the overall accomplishment depends upon the personnel and the care of application. Consequently, the success of the program and ultimate decrease in engine corrosion depends almost entirely upon the diligent cooperation of operating, overhaul, and supply activities in discharging their functions and responsibilities efficiently.

VALUE OF OPERATING TIME LOST BECAUSE OF CORROSION

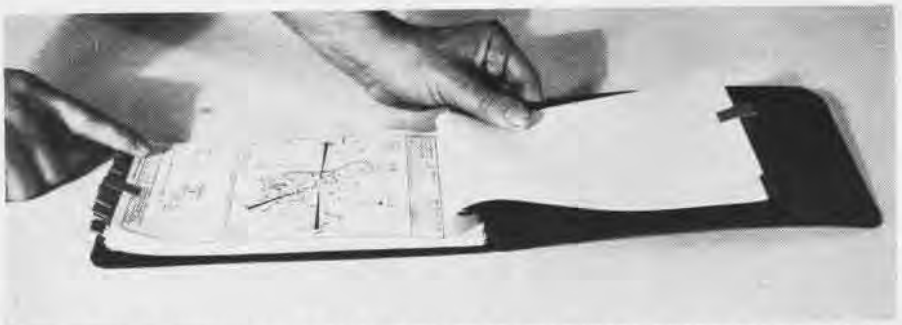
ENGINE MODEL	ENGINES OUT OF SERVICE	OPERATING HOURS LOST	COST PER HOUR LOST	TOTAL LOSS FROM CORROSION
R6 80-17	7	2,506	$1.48	$3,708.88
R985-AN-1, 3, 6, 12	43	11,008	3.40	37,427.20
R1340-AN-1	124	23,324	4.11	95,861.64
R1830-94	30	6,213	5.08	31,562.04
R1830-92, 92A	7	2,801	4.77	13,360.77
R2800-10, 10W	20	2,332	16.11	37,568.52
R2800-18W	6	798	12.99	10,366.02
R2800-22, 34(W)	19	5,000	8.08	40,400.00
TOTAL	256	53,982		$270,255.07

Overpriming Engine Causes Fire

VJ-VR 1—"Fire in 90392!"

These words recently galvanized the OD into action when an engine caught fire during a preflight following an en route service check. Fabric on one aileron of the plane was completely burned away and the paint was slightly blistered on the exhaust path. Investigators assigned the blame to overpriming of the engine and made the following recommendation for prevention of such accidents:

1. Strict compliance with directives regarding R-2000 engines.
2. A large additional fire extinguisher, manned and immediately adjacent.
3. Thorough wiping of all surfaces along exhaust path prior to starting the engine.



BOOKLET HOLDS INFORMATION VITAL TO PILOTS IN INSTRUMENT, EMERGENCY CONDITIONS

Marines Make Handy Flight Book

MAG 31, MCAS MIRAMAR—This group recently assembled and adopted as standard squadron equipment a unique pilot's flight book. It is ideal for pilots of fighter type aircraft because of its small size—five and one-half in. by nine and one-half.

The book consists of 27 pages of photographic reprints bound together with a section of brown filing folder. Carried in the map case of all group planes, it is readily available in case adverse weather closes in the local area.

All the pilot has to do is request the weather report from any station covered by his flight book. Referring to the page covering his new destination, he has complete radio range information and can make a safe instrument approach and letdown. The notebook is also used during routine training and simulated instrument flights.

The book contains the following information: ZBX chart and code, stations, identifying signals, frequencies and assigned channels; a chart of VHF channels and frequencies for day and night operations, and a diagram of magnetic directions, distances and safe altitude minimums to fly to airfields within a 200-mile radius of Miramar.

Two entire pages are devoted to a composite picture of all radio ranges and distances between radio range station within the 200-mile radius. Photo reproductions from H.O. 510 show radio ranges and procedures for all stations in the area.

Besides diagramming several airfields, the book also contains sketches of GCI and GCA procedures for controlled landings at Miramar and shows procedures for holding and making emergency letdowns.

Other diagrams explain radar beacon homing and holding procedures with minimum safe approach altitudes, procedure for working the San Diego radio range, and various holding, close-in and orientation procedures.

Cardox System Brings Savings

NAS PENSACOLA—A substantial reduction in material cost has been effected by the commissioning of a six-ton storage capacity liquid carbon dioxide (Cardox) system by the A&R Department. The changing of approximately 1,000 fire extinguisher bottles per month at this command has been simplified and speeded up.

The Cardox system has many advantages over the former method of using solid CO_2 (dry ice) in 50-pound cubes. It has eliminated the delay made necessary by converting from a solid to a liquid, costly handling changes, loss by evaporation, and hazards from handling by A&R personnel.

The Cardox system serves the additional purpose of automatic fire protection for the carburetor test room, where low test gasoline is used, by automatically releasing CO_2 from two large nozzles when the temperature reaches a dangerous high.

The system is novel in that it has three additional manual controls and employees are warned to evacuate the room by an electric horn which sounds off 15 seconds before nozzles open.

It is estimated that a saving of approximately two hundred dollars per month is realized by using the present method of delivery of liquid CO_2 by a refrigerated truck.

VU-7 Has Mobile Fire Fighter

UTWINGS, PACIFIC—Utility Squadron 7 at NAS SAN DIEGO has developed a fire-fighting cart for use in restricted areas. Fire-fighting equipment contained is standard Navy equipment and consists of the following:

Two 15# and one 2½# carbon dioxide fire extinguisher, one 2½# Foamite extinguisher, 5 gal. hand pump water extinguisher, 3-foot bolt cutter, pair of asbestos gloves, two 12-quart sand buckets, fire ax and 150′ 21-thread manila line.

FRONT AND REAR VIEWS SHOW EQUIPMENT

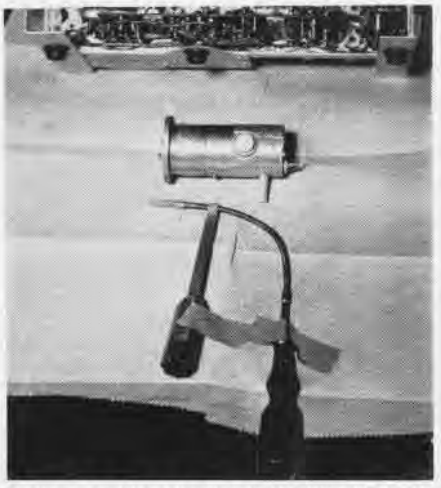
The cart is 2′ 6″ wide and 4′ long. Height is 2′ 6″. Operation of the cart could be greatly improved by substituting rubber-tire wheels for the present iron wheels. The cart is brought to the scene of the fire to help control any fire until the NAS fire department arrives. It does not relieve any individual from specifically assigned equipment needed in his fire zone.

Each piece of equipment is assigned to a certain man who has been thoroughly instructed in its use. They also are trained in artificial resuscitation and first aid.

▸ *BuAer Comment*—**This idea is a good one, particularly the personnel training aspect. Cart should be painted red, if not already so.**

New Screwdriver Reduces Work

NAS ALAMEDA—A new type screwdriver developed by the Electronics Division of A&R has saved many man hours in the repair of APX radar units. The use of ordinary screwdrivers in removing motors for APX sets for overhaul and servicing requires approximately two man hours per set.



FLEXIBLE TOOL WORKS IN CROWDED SPACE

Use of the new tool has reduced the time of this operation to one hour and 25 minutes. Production records indicate that three hours a day per man have been saved. The tool has also caused the amount of breakage to be reduced as it does not break wires and connections as did the old type.

Usable on various other type of equipment, this tool can be made from scrap material. Only requirements are an old screwdriver, a piece of mechanical linkage and a piece of brass 5/15″ x 5/16″ x 6″.

▸ *BuAer Comment*—**The flexible screwdriver described above would be a worthwhile addition to any electronics repair shop. Recommend local manufacture from available scrap material where possible.**

General Engine Bulletin No. 97

Supplement No. 1 to General Engine Bulletin No. 97 is being issued to change "disposition of parts removed and like parts in stock" to read: "Return solid plugs and vented plugs to stock."

Marines Build New Loading Ramp

MCAS MIRAMAR, HQ SQUAD—Operations and public works departments recently collaborated in building an efficient loading ramp for the R5C-R5D aircraft to which transport units are converting. Ladders furnished by manufacturers lacked safety for fast loading of passengers.

RAMP PERMITS FAST LOADING, RELOADING

The ramp was designed to serve both types of aircraft. When placed against the loading door of an R5C the top platform is flush with the plane's deck. Against an R5D, it is just one full step down.

The steps were covered with non-skid rubber matting and the leading edges were trimmed with metal to lessen wear. Four casters are used for moving the ramp and two foot-friction locks taken from surveyed work stands hold it in position.

Names Will Identify Fluid Lines

Because of complications resulting from introduction of jet aircraft in military aviation, the Navy and Army have decided to abandon the old system of identifying fuel, gas and other lines by different colors. In all new aircraft these lines will be labeled plainly with their names.

Use of color to identify the lines was simple enough when planes were simple but today's aircraft have gas, hydraulics, oil, airspeed, oxidizers, oxygen, rocket fuel, water, waste, helium or other lines. Finding a color to identify each was difficult and remembering what each color meant usually required a trip to the erection and maintenance manual.

New name labels will be placed both longitudinally and around the lines, often enough to be visible at least once in each compartmented section. Lines in ships once were identified by colors but some time ago were changed to name labels for simplicity. Existing aircraft will not be modified, but all new types will come out of the factory with their lines carrying the new system. Army-Navy Drawing 10375 will be changed to provide the changeover.

SUPPLY NEWS
FROM ASO AND SUPPLY DIVISION BUAER

Manufacturing Cable Assemblies

Some confusion exists as to how to get control cable assemblies. Today they are invariably coded "M", meaning that they are to be manufactured by the Navy and not purchased from the airplane contractor. Confusion arises mainly over who is to manufacture.

It is the intention of BUAER that Fleet and Training Command service activities manufacture control cables to suit their needs, drawing from supply the necessary bulk cable, terminals, turnbuckles, pins, etc. FASRON's, MAG Service Squadrons, Class "C" Air Stations, etc. have been allowed equipment for swaging and otherwise fabricating. Squadrons having need of such assemblies, therefore, should obtain them from the activity charged with the responsibility of servicing them, if the squadron does not have in its own organization the equipment or ability to do such work. Use of the special tools and equipment is very simple, and BUAER considers it within the workload capacity of practically any user to manufacture.

There are several reasons behind this procedure. Formerly, when control cables were purchased from airplane manufacturers, it was found that a large amount of damage resulted from shipping, storage, and handling before the cables reached the ultimate user. "Bird caging" was a frequent occurrence. Hence this was a costly method of supply.

Cables manufactured by the airplane contractor were frequently found to be of the wrong length and necessary adjustments could not be made in turnbuckles. The result was that a certain amount of rework usually had to be done by the squadron anyway, necessitating their having swaging and other equipment.

In some instances completely pre-fabricated cable assemblies cannot be installed, since terminals, etc., will not stream through guide tubes, fair leads, and over pulley installations. Consequently, it is necessary to complete fabrication after installation in the structure of the airplane in these instances.

In view of the foregoing, only bulk lengths of cable and bulk materials are to be stocked by supply points. User activities should not request fabricated assemblies from supply.

Supply of Armor Plate Is Short

Because of a shortage of armor plate for combat aircraft, ASO Circular Letter #204 directs the recovery of all armor which can be used in currently operated models. It is believed that requirements can be met from salvage, obviating the necessity of new purchase.

Not mentioned in the ASO Circular Letter is the belief that spare armor exists in various places, perhaps unidentified, and probably unaccounted for by the responsible supply activities. It is understood that operating squadrons and CASU's often removed armor from combat type aircraft being used for continental or fleet training in order to lighten the airplane. In most instances this armor was not turned into supply activities. In other instances it may have been returned to stock but not properly identified. Therefore, it is requested that operating activities turn in all usable armor which can be located.

Supply activities are advised that failure properly to identify (admittedly difficult) may be their reason for reporting an out-of-stock condition, and technical assistance in identifying should be obtained.

Jet Nomenclature Standardized

A standard nomenclature and numbering system has been agreed upon by the Aeronautical Board for Army-Navy use. Detailed information will be promulgated soon. For example, the General Electric I-40 will be renamed the J-33, a designation already adopted by the AAF. See ANA Bulletin No. 306 A, dated 23 January 1947.

New Sections of Catalog Issued

During the last three months ASO has printed and distributed 16 new sections to the ASO Catalog, covering categories of material such as electrical, photographic, rivets, chemicals, plain bearings, oxygen breathing equipment, Continental and Lycoming engine spare parts, carburetor tools and test equipment, and Tigercat airframe spares procured. (See INFO from ASO for detailed listings and how to obtain in case new sections not received.)

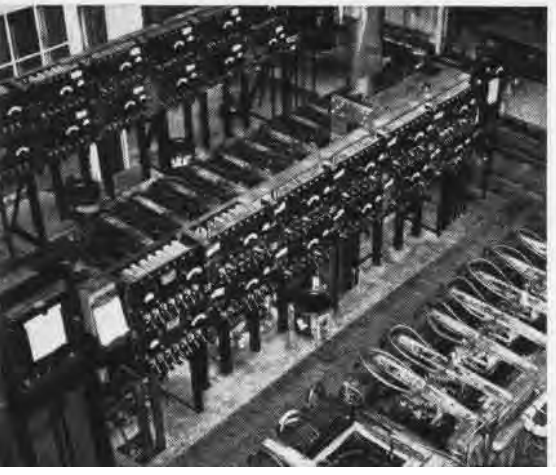
Devices Keep Air Out of Guns

Armament Division of BUAER has designed two devices to prevent entrance of cold air into muzzles of aircraft guns. The device is required in development of aircraft gun heaters.

One of the devices is a muzzle type that deflects air across the barrel of the gun. The other device is of the blast-tube type that closes, preventing air from entering the gun. Upon firing, gas pressure escaping ahead of the projectile, opens the shutter and allows the passage of the bullet.

Present shortage of material has delayed the manufacture of the blast tube type. The muzzle deflectors have been completed. Both devices will be tested under fire and flight conditions at NATC PATUXENT RIVER.

MCAS EL TORO—Tips on conservation: In the last week of the old year all old files of Headquarters Squadron Marine Air Control Group Two were cleared out and converted into confetti for use by the 50% of station personnel who were on duty.



CYLINDER PLATING AT PENSACOLA

The use of porous chromium plating as a salvage procedure for aircraft engine cylinders, a process that has resulted in tremendous savings for the Navy, is a major project at NAS Pensacola. The application of hard chromium plating to aircraft parts is a well known salvage procedure, but the use of porous chromium plating on naval aircraft engine cylinders is of recent origin and was started at NAS Pensacola when the cylinder reclamation plant began operations in May, 1946.

In contrast to hard chromium, porous chromium contains a network of small, interconnecting channels which retain the oil necessary for cylinder lubrication. Present practice is to reclaim cylinders that are no longer within acceptable dimensional limits as the result of wear, warpage, or corrosion. This practice offers the following desirable economic features:

1. All reclaimed cylinders are standard size, which eliminates the need for oversize rings and pistons.
2. Cylinder life is increased approximately fourfold, the wear being only one-half thousandths inch on the bore diameter per thousand hours of service.
3. Cylinders are not subject to corrosion after plating.
4. The cost of overhauling a plated cylinder after service is reduced.
5. The reclamation cost is significantly less than either replacing a cylinder or rebarreling a used cylinder.

Cylinder reclamation can be divided into three major processes: grinding, plating, and honing. Scheduled production is typified by detailed observance of the requirements for each operation. A step-by-step description of the reclamation process follows:

Lapping. The first operation of the reclamation process is lapping the cylinder hold - down flange, illustrated by *Figure 1*. During the grinding operation which follows, the cylinder is firmly bolted to an adapter plate by means of the hold-down flange. Uneveness of the flange surface will result in uneven grinding of the bore, because cylinder warps in the fixture.

Grinding. The next operation, grinding the bore, is shown by *Figure 2*. In this process the choke is removed and the cylinder is ground straight, sufficient only to remove all ring steps and low spots. In the final grinding operation the wheel is allowed to "spark out" to produce as smooth a surface finish as possible. Immediately after grinding, the freshly ground surface is coated with a preservative oil mixture.

Measuring. *Figure* 3 shows the measuring operation. The cylinder diameter is carefully determined and the oversize figure is recorded in the plating data card. The plating data card, when the cylinder is completed, will contain a complete history of the processing data for that particular cylinder. Also at this time a plating tag which shows the plating time for each plating operation is attached to the cylinder.

Identification. Each cylinder is given a serial number which is etched on the cylinder skirt. Also the cylinder is etched to show that it has been chromium plated and to show the amount oversize in thousandths of an inch before plating. After the cylinder is etched, cylinder feet, as shown in *Figure 10*, are attached to the rocker box studs to facilitate handling.

Waxing. The cylinder is waxed to prevent electrolytic etching effects or plating from occurring except on the cylinder wall which is to be plated. Preceding the actual waxing operation, the cylinder is first degreased to remove any oily substance and to heat the cylinder so that the wax will adhere firmly. The flow control ring is then installed in the cylinder head end and the cylinder is immersed in the wax, which is maintained at 190° F. The anti-bead ring is next installed and accurately gaged. The cylinder is immersed again in the heated wax to a point just below the anti-bead ring. After waxing, any wax adhering to the upper surfaces of the anti-bead ring is removed, as is any wax remaining on the cylinder wall. The cylinder is then wiped clean with a cloth dampened with solvent. *Figure 10* shows cylinders ready to be plated.

Cleaning. The cylinder is cleaned with pumice on a tampico brush approximately the diameter of the cylinder.

See *Figure 5*. Cleaning is continued until the cylinder wall surface shows no water breaks after it is water rinsed. After the cylinder has been cleaned, the robber ring is installed on the cylinder skirt. The purpose of the robber ring is to allow chromium to be plated evenly to the end of the cylinder.

Pre-Treatment. A cylinder racked and ready for pre-treatment is shown in *Figure 7*. In this operation the cylinder is made the anode in a 33 oz./gal. solution of chromic and maintained at 122° F. for 15 minutes at a current density of two amperes per square inch. This is essentially a cleaning procedure which etches the steel surfaces in preparation for plating.

Plating. The cylinder is plated by making it the cathode in a 33 oz./gal. chromic acid solution with a sulfate ratio of 112-118, maintained at 141-143° F. The temperature is maintained within ½° F. for any specific temperature setting. The current density is maintained at three amperes per square inch for the time required to plate the cylinder back to standard diameter plus an additional four-thousandths inch. This is done to compensate for plating removal during the post-treatment and honing operations. *Figure 4.*

Post-Treatment. In this operation, microscopic cracks, which have occurred in the chromium plated surfaces, are developed and enlarged to form a pattern of small interconnecting channels surrounding chromium plateaus. To accomplish this the cylinder is made the anode in a 33 oz./gal. solution of chromic acid maintained at 122° F. The current density is maintained at 2.5 amperes per square inch for 13 minutes.

Pattern Inspection. Following the post-treatment operation, the pattern is inspected and the cylinder size determined. For pattern inspection, an inspectascope is employed which magnifies the image 50 diameters, and size is determined by use of a dial gage indicator. See *Figure 9*.

Dewaxing and Cleaning. Next the stop-off wax is removed from the cylinder. Live steam introduced into an enclosed cabinet facilitates this operation. Vapor degreasing follows to remove residual wax. The wax is reclaimed.

Honing. Conventional vertical honing machines with special bakelite bonded fine grit stones are employed in this operation. The purpose of honing is to obtain a polished chromium finish on the cylinder wall surfaces. Approximately .001 to .002 inches of chromium is removed from the cylinder diameter.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Frequent inspectascope examinations are required to avoid removing the interconnecting channels, which would result in a short service life for the cylinder. If honing has resulted in broken channel patterns, the cylinder may be re-post-treated to deepen and reconnect the channel network. *Figure 6* shows this operation.

Cleaning. Honing debris, composed of minute chromium and honing stone particles, must be removed from the channel network. Residues of these abrasive particles will result in scratched cylinder bores, grooved rings and scarred pistons. Cleaning is accomplished by rotating the cylinder around two jets through which steam and cleaning compound are introduced at 100 pounds pressure in the first cycle; steam alone is used in second cycle.

Inspection. Inspection consists of an examination of the plating to determine average pattern size and channel width and depth. The cylinder surface is examined for surface finish and a final check is made of the bore diameter. Both the inspectascope and dial bore indicator are used for these determinations. *Figure 8* shows inspection.

Mechanical Overhaul and Identification. Following acceptance of the cylinder, the exterior is sandblasted and metal sprayed to prevent corrosion. The valve seats are ground, valve mechanism installed, and spark plug inserts replaced if necessary. *An orange band painted just above the flange identifies the cylinder as having been chromium plated.* Following these operations, the cylinder bore is again steam cleaned to remove any debris resulting from grinding.

Since production was started in the reclamation plant, NAS PENSACOLA has overhauled approximately eight thousand aircraft engine cylinders, using the porous chromium plating process. This is considered an excellent record in view of the fact that full production was not reached until the latter part of August 1946. NAS PENSACOLA is the first to employ this process one hundred percent on major overhauls.


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AVIATION PROGRESS

Short gleanings from Progress Reports of various BuAer sections are presented below. They represent progress during February, contained in March summaries.

Pilotless Aircraft Division

F6F-5K—The production of 360 F6F-5 planes to F6F5K high performance target drones has been authorized. The first 40 of these *Hellcats*, equipped with the air pick-off automatic pilot, are nearing completion. Production conversion of F6F-5K planes equipped with P1-K automatic pilot will be commenced in the near future.

Piloted Aircraft Division

SC-2—The contractor is incorporating trial board changes on the SC-2 airplane so that the Board of Inspection and Survey trails may continue.

XBTM-1—This new Glenn L. Martin attack plane is now undergoing BIS trials at Patuxent River. An extensive program is underway to rid the production model (AM-1) of deficiencies noted in experimental model. The production line will probably be delayed three to six months while deficiencies are corrected. Only three AM-1's have been built to date.

AD-1—No more AD-1's will be accepted until defects uncovered in service are corrected. The 19 AD-1's already delivered to COMFAIRALAMEDA are being returned to El Segundo for modification. Six planes delivered to COMAIRLANT will be reworked at Norfolk with the technical aid of the contractor. Contractor believes he can accomplish modification program and still deliver 140 AD-1's by 30 June. The first modified plane has already been accepted.

PB4Y-2S—The prototype PB4Y-2s is approximately 20 percent complete. The searchlight on this plane will be linked hydraulically with the Mk XXIII bombsight and controlled by an operator in bow. Release of sonobuoys will be controlled by pilot. The plane will carry a sonobuoy receiver and wire recorder. Provisions will be installed for carrying the Mk XXIV torpedo.

FR-1—Total number of this plane is being cut to 34. The remainder will be cannibalized for parts. All planes have been ungrounded subsequent to inspection of nose wheel door fitting.

F8F-1—Wing tips were successfully jettisoned from an F8F-1 during an 11 "G" pullout at low altitude.

XPBM-5A—This amphibian patrol plane is still at contractor's plant at Middle River, Md., undergoing revision to horizontal tail to incorporate double spring loaded tabs. Contractor is also investigating the possibility of incorporating a steering control on the nose-wheel. Patuxent has recommended revision of braking system to avoid overheating and excessive wear encountered by it under normal taxi maneuvers.

XR6O-1—Test flying is progressing at contractor's plant. Plane has obtained a rated power to at least 25,000 ft. on a standard day. Preliminary flight check of power plant cooling at 10,000 ft. with revised configuration, reveals a marked improvement, indicating that satisfactory configuration probably has been obtained. AC fuel pumps have been removed and 24 volt DC pumps installed as safety factor in event of failure the two A.P.U.'s during take-off.

XSN2J-1—The first plane of this model flew successfully at the contractor's plant on 10 February.

XNQ-1—The first flight article of this primary trainer has been completely instrumented and is being used by contractor for complete flight test prior to demonstration.

J4F-2—The contractor has agreed to supply a completely removable hull bottom on this modified *Widgeon* in lieu of the three removable step blocks originally requested. No increase will be made in contract cost.

Ships Installations Division

Shangri-la—This carrier has received F7F barrier adapters with instructions for installation, and operation for use in connection with phase 2 of service evaluation of this airplane.

F8F—Grumman Aircraft has indicated that it will rework tail hooks that have failed at the fishmouth weld. COMAIRLANT has 75 defective hooks and COMAIRPAC has 84.

Armament Division

20mm Ammunition Booster—A contract has been let to W. L. Maxson Corp. to develop an ammunition booster capable of lifting 100 lbs. of ammunition at a firing rate of 1000 rounds per minute. Prototype is now being tested.

Torpedo Nose Cap Release—The Naval Gun Factory's project to develop a torpedo nose cap release that is smaller, lighter and more efficient than the type now being used is near completion. First drop tests were made at the NAVAL TORPEDO STATION, NEWPORT in February. Two types of mechanical releases, both lighter and smaller than the type now in use, have operated successfully in tests.

Technical Data Division

Aeronautical Museum—Technical Data Division is undertaking selection, collection and preservation of unclassified Naval and ex-enemy aeronautical material for deposit in the National Air Museum, under Smithsonian Institution. Navy lists will be compared and screened with corresponding Army lists for final selection. Instructions then will be issued for preservation and shipment to the museum collection point picked by the Museum Advisory Board.

Airborne Equipment Division

Pilot Ejection—Ground ejection tests at NAMC PHILADELPHIA using live subjects with arm-rest support instead of the face-curtain type support, have indicated the latter method is more desirable. When accelerated vertically, using arm rests, the subject's head rolled forward on his chest. Following this acceleration, pains in the chest and shoulders were experienced. Propellant temperature tests have indicated greatly reduced velocities at temperatures as low as –60° F.

Stronger Seats—Two "40G" seats for installation in an SNJ aircraft at NAMC PHILADELPHIA are being procured. The seat installations will be tested to determine if the seat and carry-through structure will withstand loads of that size during a crash.

Parachute Tests—National Bureau of Standards has been asked to provide an instrument system to measure and record parachute performance. It would measure the shock opening impact, landing impact, degree of oscillation and possibly rate of descent. Measurements must be transmitted to the ground by telemetering or other means.

Back Type Chutes—Reports have been received that the present Navy Standard back-type parachutes do not fit satisfactory in F8F seats. An experimental lot, involving a different design, is being purchased for issue to a squadron for service evaluation.

Anti-buffet Helmets—Fifty improved lightweight anti-buffet helmets are being procured. These helmets are designed to give head protection to jet pilots, with a minimum of bulk and weight.

Gun Heaters—Development of a heating system for 20 mm. F4U-4B aircraft at Vought is near completion. Plane will be sent to Patuxent for flight test. The F6F gun heating system also is being readied for flight test. Dahlgren tests demonstrated a danger existed of carbon monoxide fumes from gun firing gaining access to cockpits of those two type planes.

Airspeed Light—Quotations are being received on a transmitter which will operate a system of lights indicating the approach air speed to the landing signal officer during carrier approaches while on night operations.

Electronics Division

Radar Trainers—As radar equipment was developed during the war, it was apparent that some classroom trainer was necessary for training radar operators in flight. Under stress of immediate requirements many different versions of radar classrooms were turned out. Overhauling and maintenance of these aircraft are problems due to this non-standardization. Prototypes of the following planes are being made at overhaul activities and on completion standard trainers will be modified and sent to training activities: R4D-6E, R4D-6T, SNB-3E, SNB-3Q, SNB-3N, PBY-2E.

The following check list of books and magazine articles makes no attempt to cover the entire field of current aviation writing. It does, however, suggest some of the titles considered most likely to interest naval aviation personnel.

BOOKS

Air Transport At War. Reginald M. Cleveland. Harper, 1946. (A factual history of transport service rendered during World War II by scheduled airlines, ATC, and NATS.)

Operation Lifeline. James Lee. Ziff-Davis, 1947. (The complete story in text and pictures of the Naval Air Transport Service.)

The Official Pictorial History of the AAF. Historical Office of the Army Air Forces. Duell, Sloan, and Pearce, 1947.

The Battle for Leyte Gulf. C. Vann Woodward. Macmillan, 1947. (An accurate, factual, straightforward account of a great naval action.)

The Aeronautical Dictionary. Thomas A. Dickinson. Pitman, 1947. (Over 6,000 aeronautical terms defined, with drawings, photos, and charts.)

MAGAZINE ARTICLES

G. C. A. for "All-Weather" Flying? Laurence LeKashman. *Aero Digest*, Vol. 54, No. 2, Feb. 1947, pp. 42, 43, 142, illus.

British Prop-Jet Progress. W. Nichols. *Aero Digest*, Vol. 54, No. 2, Feb. 1947, pp. 63-65, 139-141, illus.

The Nature of Shock Waves. Max M. Munk. *Aero Digest*, Vol. 54, No. 2, Feb. 1947, pp. 66, 67, 137-139, illus.

Aviation Is Still An Infant. Hon. W. Averell Harriman. *Aero Digest*, Vol. 54, No. 3, March 1947, pp. 19, 116, 123, 124.

Douglas D-558 "Skystreak." *Aero Digest*, Vol. 54, No. 3, March 1947, p. 35, illus.

Cornell Aeronautical Laboratory. *Aero Digest*, Vol. 54, No. 3, March 1947, pp. 59-61, 134, 135, illus.

Composite-Powered Aircraft. Ben T. Salmon. *Aero Digest*, Vol. 54, No. 3, March 1947, pp. 66-68, 130, illus.

Naval Needs: "Problems of Naval Aviation Confronting the Aeronautical Engineer." *Aeronautical Engineering Review*, Vol. 6, No. 2, Feb. 1947, pp. 22, 23.

Technical Development of Bomber Aircraft. Marcus Langley and J. J. Gerritsen. *Aeronautics*, Vol. 15, No. 5, Dec. 1946, pp. 53, 54, 57, 58, 61. An extensive historical review of British bomber aircraft built during the period from 1916 to 1943.

Standardizing Radio Navigation Systems. *The Aeroplane*, Vol. 71, No. 1855, Dec. 13, 1946, pp. 709, 710. Recommendations for standardization of radio equipment on an international basis.

The State of Aviation. T. P. Wright. *Air Affairs*, Vol. 1, No. 2, Dec. 1946, pp 139-151 (*Air Affairs* is a new quarterly international journal devoted to the study of aviation in its broad effects on economics, law, social relations, government, international affairs, population trends, warfare and the maintenance of peace.)

Airpower and Peace. Eugene E. Wilson. *Air Affairs*, Vol. 1, No. 2, Dec. 1946, pp. 178-183.

Science and Air Power. Gen. H. H. Arnold. *Air Affairs*, Vol. 1, No. 2, Dec. 1946, pp. 184-195.

War in the Pacific. R. A. Ofstie and J. A. Field, Jr. *Air Affairs*, Vol. 1, No. 2, Dec. 1946, pp. 196-217.

Arctic Air Transport. Trevor Lloyd. *Air Affairs*, Vol. 1, No. 2, Dec. 1946, pp. 218-232.

Jack Northrup and His Flying Wing. Frank J. Taylor. *Air Facts*, Vol. 10, No. 2, Feb. 1947, pp. 9-14.

The Blind Landing Situation. Robert N. Buck. *Air Facts*, Vol. 10, No. 2, Feb. 1947, pp. 31-37. Relative merits of SCS-51 and GCA presented in non-technical fashion.

Maintenance and the Future. Winston C. Castleberry. *Air Force*, Vol. 29, No. 10, Nov. 1946, pp. 54-57, illus. Positions in aircraft maintenance.

One Man One Plane. *Air Force*, Vol. 29, No. 10, Nov., 1946, pp. 40, 41, illus. Careers in skywriting, sign-towing, and agriculture.

Time-Table Operators. John S. White. *Air Force*, Vol. 29, No. 10, Nov. 1946, pp. 26-29, illus. Positions in scheduled air transport.

Uncle Sam's Civilian Air Force: U. S. Civil Service Offers Veterans Lifetime Employment If They Have What Is Needed. William S. Friedman. *Air Force*, Vol. 29, No. 10, Nov. 1946, pp. 18-20, illus.

Box Kites to Bombers. *Air Force*, Vol. 30, No. 3, March 1947, pp. 32-39, illus. The history of Glenn L. Martin's achievements in aviation from 1909 to the present.

High-Intensity Lights Aid All-Weather Flying. Amos L. Lewis. *Air-Sea Safety*, Vol. 1, No. 1, Nov. 1946, pp. 45-51, illus.

Open Sea Seaplane Operations. *Air-Sea Safety*, Vol. 1, No. 1, Nov. 1946, pp. 45-51, illus.

Navy Yanks 'Em Fast. *Air-Sea Safety*, Vol. 1, No. 1, Nov. 1946, 63, 64, illus. A Navy survey of air-sea rescue work during the war.

Transoceanic Navigation. Guy L. Arnold. *Air-Sea Safety*, Vol. 1, No. 1, Nov. 1946, pp. 6-10, illus.

Aviation's 1947 Yearbook. *Aviation*, Vol. 46, No. 3, March 1947, pp. 67-124, illus. Specification tables on American and foreign personal, executive, transport, military, and research aircraft, with engineering drawings and photographs.

New Aero Progress Revealed at I. A. S. Technical Sessions. *Aviation*, Vol. 46, No. 3, March 1947, pp. 127, 128. Summaries of papers presented at Institute of Aeronautical Sciences annual meeting.

Automatic Flight Pioneered on AAF All-Weather Airline. Robert B. Hotz. *Aviation News*, Vol. 7, No. 8, Feb. 24, 1947, pp. 10, 11.

Large-Scale Attack on Airport Lighting Problem Under Way. Blaine Stubblefield. *Aviation News*, Vol. 7, No. 10, March 10, 1947, p. 10.

Power Installations. I. F. M. Owner. *Flight*, Vol. 50, No. 1980, Dec. 5, 1946, pp. 625, 627, illus. The various types of aircraft likely to be produced during the next five to ten years are outlined, together with the power units that will be required.

Britain's Power Units. *Flight*, Vol. 50, No. 1978, Nov. 21, 1946, pp. 566d-566h, 567, 568, illus. Descriptions, cutaway drawings, and tabulated specifications of 27 reciprocating and 10 gas-turbine engines.

Learn to Fly from the Insect. William B. Stout. *Flying*, Vol. 40, No. 1, Jan. 1947, pp. 34, 35, 64, 66, 68, illus.

Revolution in Maintenance. *Flying*, Vol. 40, No. 3, March 1947, pp. 27, 68, 70, illus. Major overhauls are eliminated in new progressive maintenance plan for NATS Skymaster fleet.

Fog Factory. Gaither Littrell. *Flying*, Vol. 40, No. 3, March 1947, pp. 48-50, 78, 80, illus. Fog dispersal research at Landing Aids Experiment Station, Arcata, Calif.

What is Best for Blind Landings? GCA—ILS. Lt. Col. Clarence B. Sproul; Walter J. Addems. *Flying*, Vol. 40, No. 4, April 1947, pp. 30, 31, 64, 68, 70, 72, 74, 95, 96, illus.

Dust Excluders Protect Engines

VF-19-A—Operating Grumman *Bearcats* on dirt or coral fields, this squadron has had trouble with rocks or foreign matter entering the charge air ducts of the wings and proceeding on to the carburetor. To remedy this a set of covers was built by the carpenter shop to plug the ducts.

RED FLAG WARNS PILOT 'CORK' IN PLACE

The covers were designed to be used only when the aircraft engine is not running. However, the engine may be run on the ground with no damage resulting except moderately high oil temperatures if the engine is run at length without removing the covers.

The cover has a red flag mounted on a rod sticking above the wing of the place so that the pilot can see it in case the cover is left in by the plane captain. They were made from scrap materials. The main body or actual cover is ¾" plywood, shaped and beveled to fit the charge air duct. Any wood that thick, 20" long and 5½" wide can be used. The handle is scrap metal 7" long bent to form a grip. The clip which holds the cover into the duct is made of spring steel 10" long and 4" wide, set at a slight angle to correspond to the angle of the center piece of the charge air duct. The job took one man-hour of work.

[DESIGNED BY LT. L. M. CAUBLE]

▸ ***BuAer Comment*—Local manufacture and use of dust excluders on all F8F, F7F, F4U, as well as turbo jet and prop jet aircraft, is strongly recommended in view of the epidemic of impeller nicking experienced on engines of these airplanes. Recommend against operating engines with excluders installed since heated alternate air will be drawn into the engine at low pressure which will cause excessively rich idling mixtures and possible spark plug fouling. Activities wanting to run up their engines with the excluders installed might design them to permit passage of air behind the plate and between it and the wing leading edge.**

VRF-1—By putting 52 Fleet pilots to work while they were awaiting permanent assignment, this squadron more than doubled its aircraft deliveries during the first two weeks of February. The squadron had as many as 11 PBM's headed westward at one time.

MAG-24—Uncle Sugar will look very good to all hands in Headquarters Squadron 24 South Field, Peiping, but everyone will miss these hardworking No. 1 Boys. Each section has a No. 1 Boy who does the laundry, shines the shoes, changes the bedding and cleans the lockers of each man in the squad. Individual shops and offices also keep No. 1 Boys to run errands, make coffee and clean. Cost of the houseboy to each man in a section or office is approximately one dollar per month per boy, making help pretty cheap.

LESSENING OF CONTROL AT LOW SPEED ALLOWS PLANE TO HIT IN IMPROPER ATTITUDE

BOUNCING BEARCATS

SHIPBOARD cameras which have recorded many a hair-raising landing got a real workout recently when BUAER conducted landing tests aboard the USS *Franklin D. Roosevelt*. Test pilots tried every type of landing in the books and a few more besides.

Studies and tests were conducted to find out what happens to an F8F, F4U or F7F from the time it enters the groove until it is parked on the deck. Cameras were only a part of the full instrumentation used aboard planes and carrier to gather quantitative information on the structural effects of carrier landings.

This data covered the effects of cut height, speed at cut, use of controls upon sinking speed and resultant loads upon aircraft structure. Data on F4U and F7F tests will appear in future issues of NANEWS.

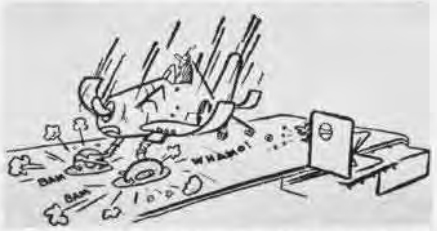
Loads and acceleration imposed on plane structure were recorded by strain gage-oscillograph systems carried in the aircraft. Sinking velocities were determined by special cameras aboard the ship.

BUAER technicians conducting the tests reasoned that if operating personnel were acquainted with landing techniques least likely to result in structural damage, the demand for replacements might be lessened. They proved conclusively that coming aboard with a maximum of safety and avoiding structural damage are related objectives.

The best methods of eliminating structural damage also were found to conform to the old "thumb rules" used by carrier pilots. A high and slow cut increased probability of blown tires and wrinkled wings and fuselages. From the measured data obtained, BUAER experts drew the following as the "optimum" landing technique:

The pilot, having flown his airplane in to a constant-altitude, constant-speed approach in line with the center of the deck, is given the cut. Height above deck is roughly 25 ft. varying with LSO's corrections for deck motion. Speed at cut is such that the three to five kts. lost during descent allows plane to reach power-off stalling speed at contact with the deck.

Immediately after the cut, change in trim and loss of lift due to loss of power cause the plane to nose down, picking up sinking speed. The pilot flares the flight path of his plane by means of his elevators so as to reduce sinking speed and yet avoid floating. In this way he picks up the second to fourth wire, contacting the deck with relatively little vertical velocity.



DILBERT LIKED THE HIGH ALTITUDE CUTS

Naturally, pilots and LSO's are not expected to hit the optimum values every time. Thus carrier aircraft are designed so that a few hard landings will not put them out of commission.

Achieving proper speeds by the pilot and LSO is a big order. The Bearcat has a power-on stalling speed which is significantly less than power-off stalling, varying with aircraft weight and the nature of external stores.

The tests proved what many veteran LSO's have contended for years—you can not trust an airspeed indicator when flying in landing approach attitude. In some F8F-1's the indicator static vent is located behind the cockpit canopy, causing it to read too high when near stalling.

This vent is now placed on the belly of the plane just aft of the wing trailing edge to give more accurate readings. BUAER F8F *Service Change No. 20* will eventually convert the vent on all F8F-1's to the new type. The old type installation also causes the altimeter to read 100 ft. too high at stalling with an open canopy, not exactly a handy trait. With new-type vent the altimeter read about 20 ft. too low at stalling speed.

The following table illustrates these variations:

V_i	V_e (old)	V_e (new)
pilot reads	actual	speed
70 Knots	71 Knots	80 Knots
75	73	82
80	75	84
85	78	87
90	82	90
95	86	95
100	90	100

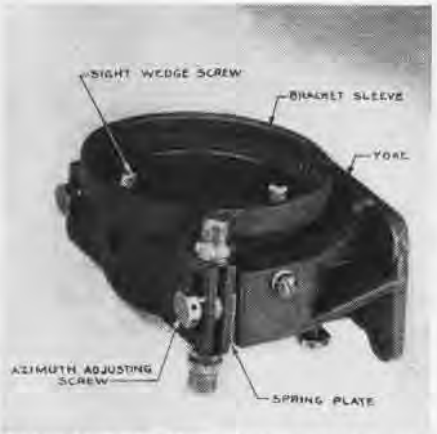
The F8F-1 at a landing weight of 9350 lbs. should have an actual landing speed (calibrated) of not less than 80 kts. This speed, together with a "cut" height of from 15 to 35 ft. will keep pilots out of trouble and planes undamaged.

However, even from an average cut height, diving for the deck jeopardizes aircraft structure and can cause a serious bounce into the barrier or over the side.

HARD LANDING PUTS PLANE OUT OF COMMISSION, SOMETIMES DAMAGES ARRESTING GEAR

AVIATION ORDNANCE

INQUIRIES SHOULD BE ADDRESSED TO THE CHIEF OF BUREAU OF ORDNANCE



UNASSEMBLED PARTS ARE EASILY LOST

BuOrd Studies 20 mm. M3 Driving Springs

BuOrd received a recent RUDAOE reporting defective replacement driving springs, ARMY ORDNANCE DRAWING A25596, used on the 20 mm. M3 aircraft gun. Inspection of 1000 springs in the lot from which defective springs were issued, revealed that approximately 10 percent were below mandatory drawing requirements. Ten percent were above mandatory drawing requirements.

To insure proper operation of gun, the mandatory load and dimension requirements of the spring must be met. A spring, with mandatory requirements below drawing specifications, may fail to fire the gun because of a lightly struck primer. Conversely a spring with mandatory load requirements above drawing specifications may break because of over-stressed coils. Squadrons experiencing failures during gunnery exercises, can attribute the cause to one of these spring defects.

The only positive method of determining the acceptability of a spring is by inspection in accordance with the drawing specifications. For the aircraft gun, 20 mm. M3 driving spring these specifications are:

SPRING, HELICAL.
Steel WD 6150

*Outside diameter, solid not more than	.740"
Mean diameter, free (approximate)	.615"
*Inside diameter, free, not less than	.490"
Diameter of wire	.105"
Number of working coils	93
Free height (approximate)	26.5"
*Solid Height, not more than	10.2"
*Load at height of 19.75" 50 lbs. or —	10%
*Load at height of 12.75" 100 lbs. or —	5%

Ends closed and ground square
Test on .470 diameter bar
*Mandatory Requirements

BuOrd Adds Bolt Handles to Tool Set

Bolt handles, BUORD STOCK NO. 1-H-1140, previously have been stocked with the basic .50 caliber BAM gun M2. Because .50 caliber BAM guns incorporate either a remote charging device or a hand retracting mechanism for charging guns, both handles will be furnished as an accessory and tool for shop overhaul and line maintenance use.

Tool set, BUORD STOCK NO. 1-T-1792-760, for .50 caliber BAM gun, M2 will be enlarged by the addition of two bolt handles.

How To Remove A Mk 1 Mod 3 Bracket

BuOrd investigation of recent excessive issues of Mounting Bracket Mk 1 Mod 3 for the illuminated sight Mk 8 indicates that some activities have been removing the illuminated sight, Mk 8 Mod 6 or 8, from aircraft by disconnecting the azimuth adjusting bolts for the mounting bracket Mk 1 Mod 3 (*see cut*), rather than by loosening wedge screws or removing entire bracket.

This results in separating bracket sleeve from yoke. When a new sight is to be installed the bracket mounting sleeve is not available and complete new bracket must be furnished. In several cases it was found that even with the sleeve available, springs, spring plates and bolts had become lost in previous sight removals. Due to lack of replacement parts complete new brackets had to be furnished.

In view of the generally restricted space in the pilot's compartment it is usually impossible to loosen wedge screws to remove sight until after mounting bracket sleeve has also been removed. Accordingly it is recommended that the sight, complete with bracket, be removed from plane. Then wedge screw should be loosened and the sight removed. If, as in the case of recessed sights, mounting bolts are not accessible when sight is installed, and sight will have to be removed by disconnecting the azimuth adjusting screws.

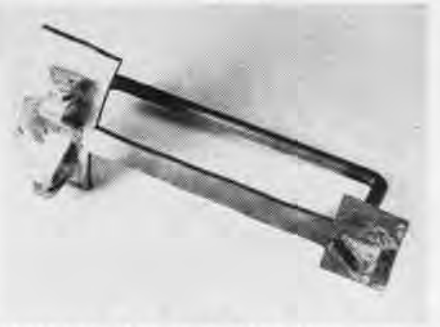
Upon removal of sight, mounting bolts become accessible and the remainder of bracket can be removed. To prevent loss of various small parts, the sleeve should be reassembled to the yoke immediately after removal of mount.

Azimuth adjusting screws, STOCK NO. 2-S-1680-100, are the only items that are available in the aviation ordnance supply system. They are not to be stocked for issue and are to be requested only as required. In an emergency, spring plates (BUORD PART NO. 438114-4) can be manufactured locally from .05 x ½" cold rolled steel bar stock. These instructions supplement those contained in OP-1494 mounting bracket (illuminated sight) Mk 1 Mod 3 service manual and will be incorporated therein at an early date.

Since the free heights of spring, as given on the drawing specification, is approximate and may vary due to manufacturing techniques, it is not possible to specify accurately the allowable amount of permanent set a spring can take before it is unsatisfactory for future use.

Most maintenance activities, with the aid of a spring scale, can improvise a method for load-testing the spring in accordance with drawing specifications. Maintenance activities unable to load-test springs are authorized to replace the driving spring when the free length is less than 23.5".

At present BUORD is investigating reasons why the defective springs are in the supply system. Comments and recommendations from activities experiencing trouble with newly installed driving springs will be greatly appreciated by BUORD. Springs found defective should be reported by RUDAOE (NAVORD 147) stating all pertinent information necessary for tracing origin of the spring.



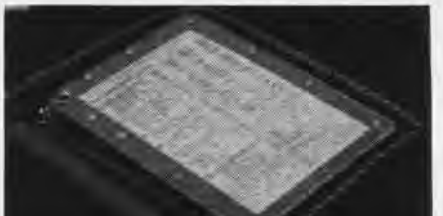
EXPENDED JATO UNIT MADE INTO TESTER

JATO Unit Tester Made Easily

FASRON-117 — Using an expended JATO unit for material, an efficient template can be made for testing JATO racks for alignment and proper operation.

The template was made by cutting it from an expended JATO unit with a cutting torch and then grinding off the rough edges. A handle is then welded on to facilitate handling. When this template is used, any discrepancy can be found and remedied before attaching a JATO unit. This command had used it for more than a year in checking hundreds of planes that have made JATO's from here without a rack failure.

[DESIGNED BY GUNNER CHARLES PHIPPS]

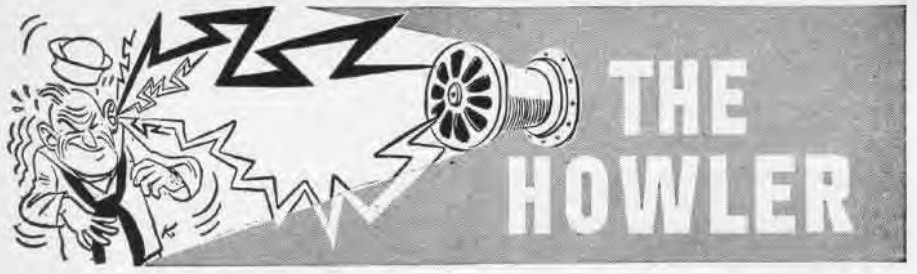


DIMENSIONS ARE SHOWN FOR RADIO GUIDE

Handy Radio Guide Assists Pilots

NAS WILLOW GROVE—Due to the large number of radio frequencies a pilot must have on hand for operation of aircraft, this station designed a chart called "Radio Aids to Pilot."

This chart is 5"x8½". The back is sheet aluminum and the front 1/16" plexiglas. The 10 ARC-1 VHF channels and their uses and the 10 ART-13 MHF channels and the frequency each is set on, is shown on the chart. In addition the YG transmitting stations which are located within an 800-mile radius of this station are listed. The chart is secured to the map case by a small length of chain which can be easily handled by the pilot while he is flying.



Detonation is responsible for the sorry condition of these pistons removed from four different engines at time of their first overhaul. The pictures tell better than words a story of loss of compression and of metal fragments scattered through the engines. Check for compliance with recommended operating instructions and restrictions.

Better Jack Maintenance Needed. Reports have reach BuAer indicating the need for improved hydraulic jack maintenance by service activities. Large quantities of wing and tail jacks are now carried in class 265, some types of which are in short stock status at the present time. Reconditioning instructions for items of ground handling and servicing equipment are the subject of a forthcoming BuAer letter and will follow generally the procedures set forth by BuAer letter MA-45, Serial 8618, of 3 February 1947, concerning repair of class 265 aeronautical shop equipment.

Better maintenance procedures are necessary for all ground handling equipment, especially hydraulic tripod jacks. Technical Note 15-46 lists available jacking equipment and offers general operating instructions. Army Air Force Technical Order 19-70A-2 of 15 April 1945 (rev. 10 Oct. 1945) entitled "Hydro-Mechanical Aviation Jacks—Operation, Service, and Overhaul Instructions with Parts Catalog" was distributed to all naval aviation activities early in 1946. This manual covers in detail the construction, operation and maintenance features of Malabar hydraulic jacks used by the Army and Navy. Copies should be available in station or squadron technical files.

Jacks which cannot be stored within hangars should be protected by canvas hoods covering the plunger and vital working parts at the top of the tripod. Plungers and extension screws should be kept well lubricated to prevent corrosion. Finally, bending of plungers, extension screws and legs can be avoided by proper use of jacks.

Consult the Erection and Maintenance manual for the airplane concerned to insure that the proper number and size of jacks are used in each case. This is especially important for aircraft equipped with four-wing jacking points (viz. PB4Y). All four points should be used simultaneously —not the two inboard points alone.

Proper storage and maintenance of this equipment is essential in view of the limited funds for procurement of new items required for aircraft maintenance.

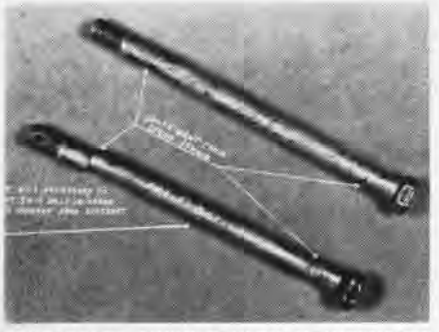
Use of Liquid Gasket Seal. Operators of S-51, R-5, and HO3S-1 aircraft are advised that excessive amounts of liquid gasket seal (Permatex) have been used by the contractor at sealing points in the main transmission.

Recently, during a 100-hour inspection of a main gear box, gasket paste was found in the oil strainer. To guard against such difficulties, transmission oil pressure should be checked closely, and, at the first sign of fluctuating pressure, the sump should be removed and the strainer screen checked. If gasket paste is found on the screen, the complete gear box should be flushed according to methods given in the applicable handbook.

Permatex is not considered an acceptable seal in this application. The contractor has been advised by BuAer that use of this sealant is not only undesirable but also unnecessary, as the gasket material, specification AN-HH-B-171, is considered adequate for this application without the need for addition of a liquid gasket seal.

Servo Valve Control Cable Failure. In a PB4Y-2 auto-pilot installation, the on-off control failed to close the servo on-off control valve because of separation of the upper attaching ferrule from the control cable housing. This allowed the flexible cable to bend under compression load and not actuate the valve.

As this was the first failure of its type reported and the aircraft affected has been in service 2300 hours, it is considered unnecessary to install a secondary engaging system. However, it is recommended that the control cable housing be inspected periodically for fraying and deterioration. If unusual wear is apparent an RUDM should be submitted and the control cable replaced.



BENT BOLTS SHOW FAULTY MAINTENANCE

Proper Tension in Nose Wheel Bolts. Investigation of excessive vibration of the nose wheel of a JD-1 during taxiing showed that the upper and lower bolts, P/N AN6-53, of the torque arm assembly, P/N 8239-46 and 8239-47, were bent and worn. This condition is believed caused by lack of tension, resulting in excessive play in these bolts during castering of the nose wheel and before the snubber, P/N 5122833, operation became effective.

Further inspection showed that eight of the nine JD-1 aircraft assigned to the activity had some degree of looseness of the bolts and of the torque arm assemblies.

Bolts of this assembly should be set at a torque tension of 300 inch pounds, in accordance with Erection and Maintenance Instructions (AN 01-40 AJ-2) section 9. All units operating JD-1 aircraft should inspect these bolts periodically for proper tension, as the bent and worn condition is the result of faulty maintenance, not defective material.

Complete Those RUDM's. Activities submitting RUDM's to BuAer are expected to comply fully with ACL 45-46. Incomplete RUDM's handicap personnel trying to handle them, all along the line. They waste time and defeat the purpose of the report system—to get accurate, speedy information and adjustment.

A typical headache is the RUDM which nonchalantly says "part number unknown," when a check in the appropriate AM Handbook would give the information quite painlessly. *You* know which parts are involved in the trouble reported. *You* can identify them accurately by checking the numbers in the proper handbook. Your RUDM becomes one of thousands when it reaches BuAer. If it is complete and accurate it will serve its purpose.

F8F-1 Arresting Hook Uplock Bolt. It has been reported to BuAer that maladjustment of uplock bolt 58939 prevented extension of the arresting hook on F8F BuNo. 94770. As a result of the contractor's investigation of this deficiency, the uplock for this arresting hook was relocated and redesigned to eliminate the adjustment feature, thereby preventing the possibility of maladjustment. The contractor has incorporated this modification in all production aircraft, starting approximately with the 111th airplane, BuNo. 94834.

No previous report of difficulties resulting from uplock maladjustment has been received by BuAer; therefore, this trouble is considered an isolated case. In view of this fact, BuAer considers the adjustable uplock on the F8F satisfactory provided that the proper adjustment, once set, is not changed.

New Arrester Hook Points Work

VF-19-A, Alameda—This squadron installed standard removable point-arresting hooks on 15 F8F-1's and made an average of 20 landings aboard the *Boxer* (CV-21), to provide service testing of the hook.

These assemblies are an improvement on the standard design. In the two-piece hook design, the entire removable point is made of improved wear-resisting material. It incorporates a grooved throat feature which can be provided in the hook point without undue difficulty, reducing pendant and hook wear.

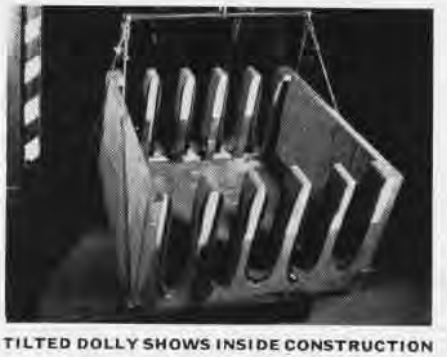
During and after all landings the hook assemblies were inspected and no failures experienced. In general, operation of the hook in a wire appears superior to previous hooks used and has less tendency to bounce.

▸ ***BuAer Comment*—Three standard hook point designs will be provided for airplane weight classes: 0 to 15,000 lb., 15,000 to 25,000 lb., and 25,000 to 35,000 lb. Hook points for all airplane types in each weight class will be interchangeable.**

Alameda Saves Money with Dolly

NAS Alameda—This activity has solved a complex handling problem by designing and making a Sure Grip safety utility dolly. The dolly is designed for the safe handling of a number of various shaped metal and fabric structural spares and small parts. Each piece is placed in a padded, stirrup-type sling, which allows flexibility of horizontal movement.

The use of multiple slings and casters, allows this dolly to be loaded and used as a portable unit on deck, or hoisting unit by crane, without rehandling materials. This saves handling time of material and labor. It also cuts down loss of time and material from damage by handling, and eliminates handling and storage problem presented by transportation and delivery.



TILTED DOLLY SHOWS INSIDE CONSTRUCTION

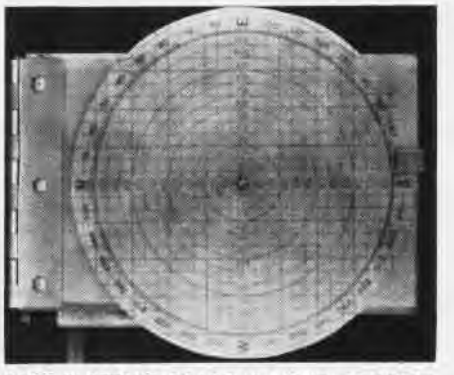
The dolly can be constructed of salvaged material and, with the work of one carpenter, two eight-hour days, for assembling, the total cost would amount to no more than $23.00. Thereby an investment of $23.00 actually saves several thousand dollars in a year's time.

▸ ***BuAer Comment*—This dolly appears to be satisfactory for handling various aircraft structural parts. One precaution should be observed in making equipment of this type—the wheel diameters of the casters should be large enough to insure easy movement over floor cracks. This type of equipment is manufactured locally by the stations to suit their local conditions.**

Pilots Use Small Plotting Boards

VF-14A, Saipan—Because of the numerous difficulties encountered with the F4U-4 type plotting board, this squadron's Navigation Department recently constructed handy knee pad plotting boards for all pilots.

Incorporating the same design as the standard board, the smaller version cuts the limit of the circle to 130 miles and



KNEE PLOTTING BOARD IS LIGHT, COMPACT

has the computer mounted on the reverse side. It measures five inches by eight inches.

A two to one scale is used to give a radius of 260 miles for high speed problems or for long range searches. YE ZB sector letters may be written around the extremities of the board. With a few hours practice, pilots of this squadron have been able to maintain a high degree of accuracy.

When in use, the standard board made it impossible to see the remote indicating compass, the engine instruments or the accelerometer. Combined with the problem of stowage, these factors have tended to reduce usefulness of the board to an emergency status.

▸ ***BuAer Comment*—The deficiencies of the F4U-4 plotting board are recognized and a project has been established at the Aeronautical Instrument Laboratory, Philadelphia, Penn., to develop and construct a knee pad plotting board for use in fighter type airplanes. The design will be based on the many ideas submitted by the Fleet. The above ideas have been forwarded to the Aero Instrument Lab for consideration.**

MARCH SUPPLEMENT

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LETTERS

SIRS:

A trophy is to be awarded at the end of each month to a pilot in Attack Squadron ELEVEN (Able) who will be voted the "Pilot of the Month." In making this award the squadron believes that it has hit upon a unique idea for the promotion of squadron spirit and for the further development of a highly trained and efficient pilot personnel.

A board of officers consisting of the senior officers of the squadron will make the award to the pilot who is outstanding in all of the following:

1. Excellence in the use of primary weapons: dive bombing, glide bombing, gunnery, rocket firing, etc.
2. Superiority in general air work and air discipline.
3. Smartness in military bearing and military courtesy.
4. Accuracy and expedition in the discharge of collateral duties.

The trophy will be a traveling trophy awarded on a temporary monthly basis with the further provision that any pilot who has been designated recipient of the award three times will be permanently awarded the trophy and his name and rank will be inscribed accordingly.

The trophy itself is to be a miniature SB2C aircraft mounted on an attractive ash tray base and plated in silver with appropriate engraving. The miniature SB2C will be a scale model with an eleven (11) inch wing span. The squadron has been extremely fortunate in obtaining the model airplane because there is a scarcity of this particular model.

This idea has met with unanimous enthusiasm on the part of the pilots of this squadron and it is believed that it will have a beneficial effect on general pilot efficiency as well as to create a good natured competitive spirit with a resultant lift in morale and unit pride.

This command hopes that this plan will be of interest to other activities of the naval service. With appropriate modifications the plan could be used by almost any activity.

R. W. STONE, LT. CDR.
COMMANDING

SIRS:

Something of a record in cross-country airline travel has been attained recently by several of VR-3's plane commanders. Most noteworthy was Lt. (jg) J. R. Rader's flight on January 29th. He commanded an R5D luxury liner carrying a 7200-pound payload consisting of 35 passengers and mail from Moffett Field, Calif. to Washington, D. C. in a record time of 10 hours and 10 minutes. Almost equaling this record, Lt. C. H. Hellie, the following day flew a 7800-pound payload of 38 passengers and mail along the same route in 10 hours and 20 minutes.

It is little wonder that this daily scheduled flight is affectionately called the *Hotshot*.

On a special cargo flight rushing 11,125 pounds of high priority medicine units from Burbank, Calif. to Norfolk, Va., Lt. Comdr. H. R. Herman piloted an R5D over the 3,173 mile route in 11 hours, averaging 288 miles per hour ground speed.

We believe a coast to coast passenger flight of slightly over 10 hours is something of a record to be shot at by any airline, military or commercial.

PAUL MASTERSON
COMMANDING OFFICER
VR-3, PATUXENT RIVER

SIRS:

Attack Squadron TWELVE (ABLE) herewith submits the results of an IBP live torpedo exercise which may be of interest to readers of NAVAL AVIATION NEWS.

On 6 February 1947 VA-12-A dropped 16 torpedoes using the USS *Major* (DE769) as a target. Mk 13 mods 6 and 7 torpedoes with exercise heads were used. Target was on a straight course and, for the purpose of assessing hits, assumed to be of 400' length. Torpedoes were released at an angle of 90 degrees on the bow at an altitude of 800' using 260 knots ground speed.

Of the 16 drops 12 were scored as hits with two torpedoes being cold shots due to igniter failure. This amounts to 75% hits (86% excluding the two faulty torpedoes). The average underwater travel was 410 yards, which is very close to the ideal underwater travel of 415 yards.

With the majority of the pilots participating in this exercise having less than 500 hours, it is felt that the proficiency attained was due to a concentrated analysis of all variables, standardization of the torpedo attack, and accurate range estimation.

GEORGE B. RILEY, LT. CDR.
VA-12-A
FPO, SAN FRANCISCO

LETTERS

SIRS:

In keeping with the recently emphasized post war economy, the Aviation Safety Board of the Naval Air Training Bases, Pensacola, has just completed a progressive year of aviation safety which saw a reduction in the frequency of the costly aircraft accidents of nearly every type. Of particular note was the increase in the number of hours flown per fatal accident, 36,000 hours as compared with 27,000 hours per fatal accident in 1945, and the reduction in the over-all accident rate over the previous year.

Accident prevention programs center around monthly inspections of training squadrons, covering various squadron departments with emphasis on safety, pilot education, and maintenance procedures. Scores are awarded on a comparative basis and combined with accident rate scores each quarter, to determine the winner of the Commander Naval Air Training Bases Aviation Safety Pennant. Recipients of the award for the year 1946 have been Squadrons VN-9(SBD), VT-3(VB2) and VT-4 (VPB).

The accompanying photograph shows Capt. William Sinton, Commander, NATB, making the presentation to VT-4, in the presence of other NATB and squadron officials.

PUBLIC INFORMATION OFFICER
NATB, PENSACOLA

SIRS:

A Guernsey bull calf wandered onto the station and was a guest for four days before the owner could be located through widespread newspaper publicity. Station personnel bought a bale of hay and nicked the chow hall for milk and oatmeal, but the calf was not happy without its mother.

The "book" had no answers on disposal and all attempts to recruit the calf into the Organized Reserve program failed. All solutions tried prior to finding the calf's mother turned out to be a lot of "bull".

GEORGE F. HOPPE, LT. CDR.
NAS MINNEAPOLIS

SIRS:

Your back cover pictures of squadron insignia have been very interesting, however I have been waiting for the appearance of one of the Rescue Squadron insigne.

As you know, these six specialized squadrons—VH-1, 2, 3, 4, 5, 6—were organized near the end of 1944. VH-3 received the Navy Unit Commendation for its open sea rescues during the Okinawa action. VH-1 operated with the B-29's on their first mass bombings of the Empire.

Both of these squadrons have official insigne approved by the Bureau. It would be gratifying to see the insigne of these two squadrons on your cover.

R. R. BARRETT, LT. CDR.
NAVAL HOSPITAL
ST. ALBANS, N. Y.

¶ Request granted. See back cover for VH-3's amusing insigne.

SIRS:

Attention All Hands VP-72 (vintage of 1941-42)!

A squadron reunion will be held in Washington, D. C. on 17 May 1947. All members in the area are urged to attend. Further information on the prospective reunion is available from Lt. C. P. Sonneborn, USN, Navy Department (Op-54), Room 4904, Washington 25, D. C.

The squadron was known as VP-14 until 1939 and as VP-51 until 1941 when it officially became VP-72.

C. P. SONNEBORN, LT.

NATS OAKLAND—The local GCA unit proved its worth to VR-2 recently. Two JRM's en route from Honolulu had been diverted to San Diego due to fog in the Bay area. Later they proceeded to Alameda and arrived at the same time a third plane arrived direct from Hawaii. The Oakland GCA unit landed the three within an hour at Alameda while the Oakland and San Francisco airports were below minimums for non-GCA operation and were closed for commercial traffic.

NATS PACIFIC—You don't always win. The Mars made it from Honolulu to Alameda in 10.2 hours but it took 18.7 hours going the other way, because of the headwinds. An R5D made it in 9.7 hours coming east and 14.7 hours outbound.

The Cover 'Mules' of the Panama Canal pull the CV *Shangri-La* through Miraflores lock in the Canal Zone on the way to participate in the atom bomb tests at Bikini. The carrier now is part of the Pacific fleet.

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NAVAL AVIATION NEWS

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SPEED MERCHANTS

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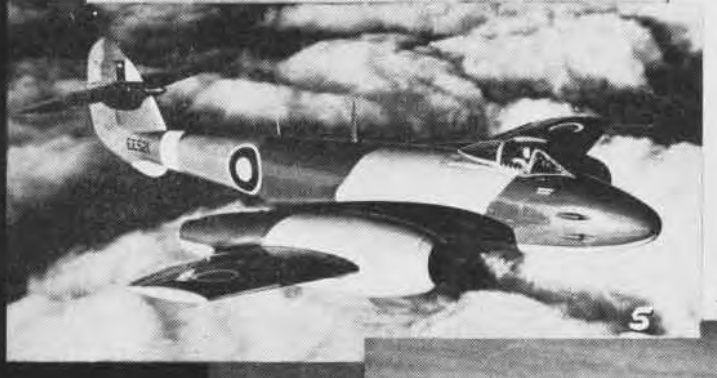

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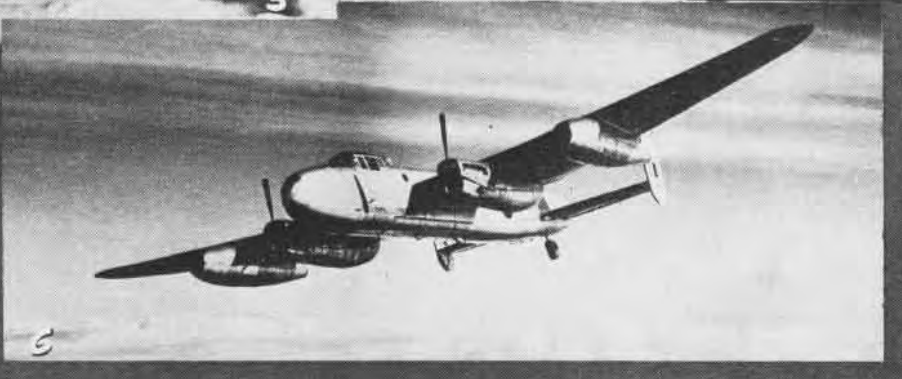

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NAVAL AVIATION
NEWS

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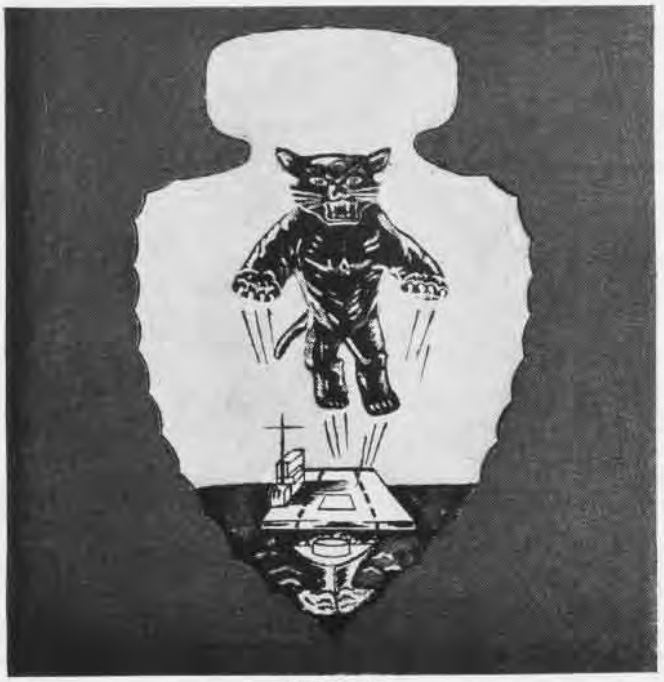
SQUADRON INSIGNIA

BOXCARS, grasshoppers, wildcats and life-saving St. Bernard dogs figure in this month's insignia. A flying red boxcar, rigged with Privateer turrets symbolizes VP-HL-7's weight and firepower. A fierce springing panther on an arrowhead, symbolizing Bearcat fighters spearheading the attacking air arm, makes up VF-6-A's mark. VH-3 received the Navy Unit Commendation for Okinawa rescues during the war. VMO-4, a Marine artillery spotting outfit, uses a grasshopper astride an artillery projectile going places to signify its military mission. VMO-2, 3, 4 and 5, all used the same general idea.

VP-HL-7

VMO-4



VF-6-A

VH-3