ANNAPOLIS OF THE AIR

One of these two naval air stations is known by that title; know which it is and where? Both are eastern bases. *Ans. on last page.*

1947 NAVY AVIATION

IF YOU want to know what is ahead, take a look at the past, some sage once said. What will happen in Naval Aviation during 1948 may have been mirrored in what Navy pilots and scientists did in 1947.

The Jet Age dropped its cloak over Navy flying in 1947 and saw many changes made to adapt the Navy to its new, modern raiment.

It was not just a case of giving a few FH-1 *Phantoms* to two or three squadrons and setting the propellered planes in a vacant lot. Aviation is not that simple any more. Somebody has to develop a jet engine that will not burn itself out in a few hours; somebody has to perfect a new engine fuel; a new paint that won't peel off at high speeds, or a new parachute to save the pilot in an emergency.

Bureau of Aeronautics during 1947 went forward on all fronts, keeping step with the more-publicized production of new airplanes by its progress in the little things that are just as vital as the slick new planes and new speed records.

In the following pages, NAVAL AVIATION NEWS will set forth in brief outstanding accomplishments of BUAER and fleet aviation during 1947. The story cannot be told fully but here are the highlights.

The most dramatic event of the year was the Navy's regaining after 23 years, the world's speed record. In the Douglas D-558, two men—Cdr. Turner Caldwell and Maj. Marion Carl—broke the world's mark in the space of five days, shoving it up to 650 miles an hour. Now there is a newer version of the D-558, a needle-nosed, jet-and-rocket powered bullet shown above, designed to explore speeds above 700 mph.

No one yet has challenged the world's long distance record of 11,230 miles set by the Navy *Neptune* last year, nor broken the 170-hour endurance flight of the XM-1 blimp. Another record, set when an F8F from a standing start climbed to 10,000 feet in 100 seconds, still stands. All three were 1946 records.

SPEARHEADING the jet trend in the Navy is the fighter. The days of the piston-powered airplane are numbered, at least in that field. Besides the two D-558's the Navy during 1947 also brought out the F2H *Banshee*, F2R *Dark Shark* and XF9F-2 Grumman.

The *Banshee* is the first Navy jet plane designed for operational use that has been classed "more than 600 mph." Like its predecessor, the *Phantom*, it is a twin turbo-jet carrier plane with a rated climb of more than 9,000 feet a minute. It takes off after a very short run and its ability to cruise on one engine gives it good endurance and range. The F2R-1 Ryan is the Navy's first plane using a gas turbine and prop.

WORLD RECORD BREAKING SKYSTREAK RAISES WHEELS OVER MUROC

Big Planes Use Jet Power Plant

EFFECTS of the jet power plant are least apparent in the attack aircraft of the Navy. No jet attack planes have been announced to date and the present operational AD *Skyraider*, now replacing the TBM and SB2C, along with the AM-1 still under test, probably will be the attack planes for some time to come. Both are 100 miles an hour faster than the *Avenger* or *Beast*.

Newest plane announced in 1947 was the Grumman XF9F-2, a 600-mph. fighter named the *Panther*. It is powered either by Rolls-Royce *Nenes* or Allison J-33 turbo jet engines. A new feature is a movable leading edge of the wing which drops down to give improved stall characteristics.

The first jet powered patrol plane already has flown, the P4M-1 *Mercator* equipped with two nacelles, each housing a radial and a jet engine. The Navy has ordered a number of P4M's. As turbo-prop engines develop further, both patrol and attack planes probably will utilize this efficient type of power plant.

One utility plane was announced in 1947, the XJR2F. Primarily designed for sea rescue work, the twin-engined Grumman amphibian with tricycle landing gear carries a three-man crew and can handle 16 litter patients.

A new intermediate training plane flew in 1947, the North American XSN2J-1. It incorporates almost all features found in a modern fighter, including carrier gear, dive flaps, rocket rails and forward firing .50 cal. guns. It is in line with the Navy's new policy of speedier training planes which saw the old SNJ shoved from an advanced to a basic trainer.

Three new helicopters joined the Navy the past year, the Bell HTL-1 trainer, the Piasecki HRP-1 twin-rotor transport and the XHJS-1, an improved Sikorsky design.

"Flying pinwheels" gained considerable stature in the Navy during 1947. Tried out in operations ranging from the equator to the Antarctic, it proved a versatile craft. Its finest showing was as a rescue vehicle for carrier pilots. Flying off the *F.D.R.*, one helicopter rescued six pilots who had to make water landings.

The XHRP-1 *Flying Banana*, carries 10 persons. The Sikorsky plane can carry five and has a four-and-a-half hour endurance. Both have winches for bringing aboard wounded. The HTL is a two-passenger, dual control trainer.

In the land-based branch, the *Ventura* and *Privateer* are being superseded by the P2V *Neptune*. The *Mariner* still reigns supreme in the seaplane field.

POWER PLANTS—

Engine research during 1947 was almost wholly concerned with turbo-prop, turbo-jet, ram-jet and rocket motors. The year saw considerable refinement in jets and development of two jet augmentation methods to boost power—water injection and after-burning in the tail pipe. Most new jets will have one or both of these systems which give up to 50% more power for short periods of time.

BUAER recently announced development of a fuel pump for a rocket engine used in the Army's XS-1 and the D-558 Phase II aircraft. The latter uses a fuel pump while the XS-1 has a gas pressure fuel feed system. The fuel pump cuts use of heavy pressure resistant tanks and lines, lightening the unit sufficiently to double the plane's endurance.

Ram-jet investigations are continuing. BUORD has one

F6U WITH STREAMLINED WINGTIP TANKS TESTED AT PATUXENT

GRUMANN XF9F-2 IS NEWEST IN NAVY JET FIGHTER LINE, HAS NENE ENGINE

Camera perspective makes *Banshee*, F2H-1, in foreground, appear bigger than *Phantom*, but it is only slightly larger

Squadrons of AD-1 *Skyraiders* began operating off carriers as the Navy's attack plane began replacing SB2C and TBM types

supersonic vehicle which has flown successfully, and BuAer has a subsonic ram-jet operating. This power plant is best in the 800 to 3,000 mph speed zone.

RESEARCH—

Wanted—a new airplane for the Navy. It must be faster, carry a heavier payload, be structurally stronger, with more range, heavier armor and armament and have good flight characteristics.

That's a large order, but that is just about what is demanded when the Navy contracts for a new plane. Research data are necessary and the Navy gets cooperation from the National Advisory Committee for Aeronautics, educational institutions and laboratories like those at Cornell University and the Navy's own David Taylor Model Basin.

Seaplanes rumbled into the speed ring in 1947 with a brand new planing-tail hull design by NACA. Tested on a modified *Widgeon*, the hull is expected to be 50% more efficient than a conventional design.

A new ditching aid was announced last year, the hydroflap. The new "crutch" device consists of a planing surface under the patrol plane's nose which can be lowered on ditching. It keeps the nose from digging under when it hits.

SHIP NAVY—

Keeping pace with BuAer in building new airplanes, two new carriers were commissioned during 1947—the CVB *Coral Sea* and the CVL *Wright*. The CV *Oriskany* was under construction in New York. Two war-tried veterans, the *Randolph* and the *Shangri-La*, were honorably retired to the inactive fleet.

The books were closed on jeep carriers. All ships in the Kaiser-class CVE-55 and CVE-6 class were inactivated or sold while 12 of the larger CVE-105 class were put in mothballs.

The Atlantic large carrier fleet thus was composed of the *Midway, F.D.R.* and *Coral Sea*, all CVB's, the *Philippine Sea, Leyte, Kearsarge, Saipan* and *Wright*. The Pacific had the *Princeton, Tarawa, Antietam, Boxer, Valley Forge*.

Carrier firsts included the V-2 bomb launching from the *Midway*, the first long-range bombardment rocket to be fired from a moving platform. The first R4D's to be flown from a carrier took off with JATO from the *Philippine Sea* down in the Antarctic and landed on skis on the snow "runways" of Little America.

Carriers also saw duty when they took Annapolis midshipmen on training cruises. The *Randolph* and *Kearsarge* shared this job. Other training operations included the Leyte's cruise of the Mediterranean and the *Floyds Bay*, an AVP, embarking in June on a round-the-world trip. The *Saipan* and *Wright* alternated to give carrier landing training to students at Pensacola flight school.

Fifteen escort carriers received Presidential and Navy unit citations for heroic combat records during the war, mostly in the spectacular Battle for Leyte Gulf. Those given the Presidential Unit Citation were the *Suwannee, Sangamon, Santee, Natoma Bay, Lunga Point, Petrof Bay, Savo Island*, and *Fanshaw Bay*. Navy Unit Commendations went to the *Chenango, Marcus Island, Anzio, Makin Island, Wake Island, Hoggatt Bay*, and *Manila Bay*.

AIR STATIONS—

Changes also were made in naval air stations during 1947. The Navy had 26 stations in full operation and eight under reduced operation. NAAS Monterey was scheduled to return from caretaker to full operation with the opening of the General Line School there.

The following stations were disestablished last year—Barin, Bogue, Brown, Bronson, Cuddihy, Ellyson, Hutchinson, Oak Grove, Ottumwa, Santa Rosa. Inactivated, to be disestablished, were Banana River, Hitchcock, Houma and Rodd. Scheduled for inactivation early in 1948 are Tillamook, Cabaniss and Cecil. There were only 6 overseas bases.

LCDR. EDWARD FAYLE, INSTRUCTOR, MAPS COURSE FOR BUFFALO RESERVES

Flight Training Is Consolidated

Naval aviation maintains a force of almost 8,000 aircraft in operation, including fleet, training and Reserve. To support these operating aircraft, about 7,000 more are in storage, pool or overhaul activities. The Navy had to train men to fly and maintain these planes.

Schools were consolidated and training courses revamped to fit the needs of the new Jet Age of aviation. In the first three quarters of 1947, a total of 1208 flight students completed the training course and 272 officers and 11,425 men graduated from technical training schools.

Pensacola, as before the war, became the hub of pilot training, taking over pre-flight from Ottumwa and absorbing training formerly given at Barin, Bronson, Cabaniss and Rodd fields. Transfer of basic SNJ training from Corpus Christi to Pensacola was completed in December. Jacksonville, headquarters of advanced training, took over Banana River and Cecil field activities.

By year's end 1,000 midshipmen were under instruction at Pensacola, plus 450 officers (including recent Annapolis grads), 50 enlisted men, 60 Marines and 50 foreign pilots.

Biggest training change was the switch from the proud and patient N2S *Yellow Peril* to SNJ's in basic. Similarly, about 35% of carrier attack type training is now being done in F4U's rather than TBM's or SB2C's inasmuch as the *Corsair* more nearly approximates the new single-seater AD-1 attack plane.

On the enlisted man's training front, technical training consolidated its schools at Memphis. Fifteen schools were moved from Ward Island and Jacksonville. Control Tower Operator's school went to Olathe and CIC school to Glenview.

Rates for men also were consolidated and new courses added, such as atomic hydrogen and inert gas welding and a training and supervision course for chiefs and first class mates. The Control Tower Operators school was lengthened to 14 weeks to include GCA and elementary phases of CIC.

BAILEY, AMM3C, MAINTAINS JET ENGINE, A NEW TASK FOR MECHANICS

NAVY MOVED ALL BLIMPS FROM THE WEST COAST TO EASTERN SEABOARD

MAINTENANCE—

If the Navy is going to have new jet planes, it has to maintain them and it has to train men to do it. To augment technical training schools, key personnel were sent to contractors' plants at Westinghouse, Allison and General Electric to learn about the J-30, J-34 and J-35 engines.

Outstanding in new maintenance techniques which came to the fore in 1947 was atomic hydrogen and heliarc welding. Solar Aircraft and General Electric furnished training in welding of high temperature sheet metal parts. Repair of the welded type turbine wheels of J-35 engines calls for specialized skill. Similarly, the process of stacking and unstacking the J-35 multiple stage compressor spindle lies outside the repertoire of the pre-jet era aircraft mechanic.

Maintenance of existing planes progressed during the year. Overhaul for jets will be handled at Cherry Point, Alameda and Norfolk. However, a highly successful program is underway at Service Test, NATC PATUXENT, demonstrating practicality of keeping turbo-jet engines in good repair without requiring complete overhaul.

Keeping Navy airplanes flying is a full-time job for a lot of people. At the close of the third quarter of 1947 1,252 planes were in process of overhaul or modification and 1,616 were in the backlog awaiting processing.

The Navy has several thousand planes stored at such places as South Weymouth, Weeksville, Glynco, Tillamook, Santa Ana, Seattle (Renton), El Centro, and Lakehurst. Outdoors storage is at Litchfield Park and Memphis.

Long-term preservation or "canning" of planes is getting underway with construction of the steel containers. Storage points will be Norfolk, San Diego, Alameda, Cherry Point, Pensacola and Philadelphia.

Extensive salvage and repair of aeronautical material was carried out during 1947 to cut down new purchases. About 2,687 airplanes and 5,650 engines have been or are being made available for this program.

LIGHTER THAN AIR—

Biggest 1947 news in blimps was the transfer of all LTA from the west coast to the eastern seaboard. Six blimps of ZP-1 bucked headwinds, storms, hot air over deserts and hurricanes to make the trip from Santa Ana, Calif., to Weeksville, N.C., and Lakehurst. Fastest trip took 50.3 hours.

During the year blimps participated in hunter-killer exercises against submarines with both Atlantic and Pacific fleets.

NAS PENSACOLA PROVIDED HAVEN FOR RESIDENTS DURING HURRICANES

PENSACOLA FOILED HURRICANE BY REMOVING WINGS, SINKING WHEELS

Considerable work was done in developing anti-submarine warfare gear for blimp installation. The Navy received preliminary design studies from two manufacturers on new ASW-type airships, embracing a new streamlined undercarriage, some of it "buried" inside the bag.

AVIATION MEDICINE—

Accelerated take-offs, rapid climb, flight at high altitudes and high speed have dumped a maze of physiological problems in the laps of aviation medicine. During 1947 a two-year plan was formulated to parallel anticipated engineering advances. New instruments of research were developed. Installation of a human centrifuge, largest in the world, capable of duplicating typical normal and emergency flight patterns, was begun.

A human catapult that will test human tolerance to accelerated take-offs and arrested landings is nearing completion. A deceleration tower that will aid in developing protection against high speed crashes was completed at Naval Medical Research institute.

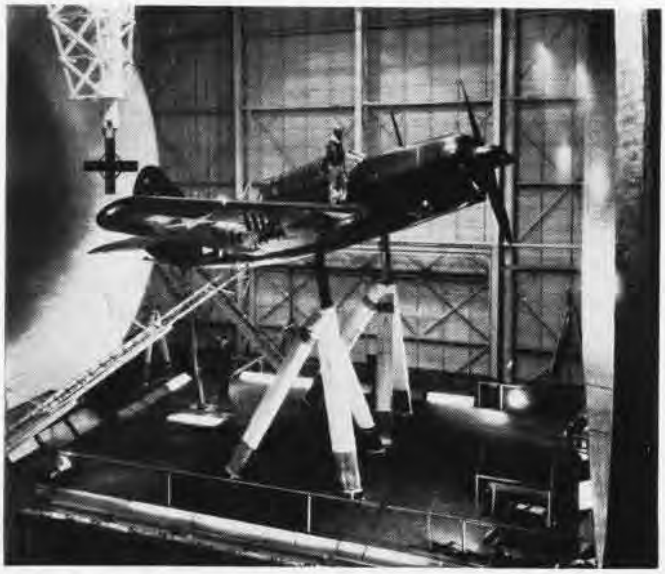
At Pensacola School of Aviation Medicine and Research, Dr. Ashton Graybiel turned in 16 reports on new discoveries as to why aviators become frequently disoriented and sometimes crash as a result. The school has also followed the leads gained in *Project Everest* when four men lived in a low pressure chamber at simulated high altitude for 30 days. They are defining the human tolerances to cabin pressurization imposed by oxygen want, bends and high altitude escape.

The Research Institute and Aero Medical Equipment Lab worked together on a biological study of jet engine noise and vibration. The latter unit worked on physiological problems in escape from high speed aircraft. At Cherry Point, studies were made in ways to bail out from a plane in flight. With plane engine turning up, the pilots in full flight clothing simulated bail-outs into nets to work out best ways to get out of the cockpit without injury.

HURRICANE TRACKING—

Navy weather squadrons cooperated with other services in 1947 in tracking a severe Florida hurricane during September. Reconnaissance planes spotted it on the 11th and made regular flights into the eye of the storm. They followed it until it moved into Louisiana, gathering data which helped warn residents of threatened areas to evacuate.

Radar-equipped planes followed the hurricane at night, when weather recco planes are not able to operate effectively. The hurricane set a record for its intensity, its erratic behavior both as to course and speed of movement and the scope of the havoc it created on its way across Florida and up into the Gulf coast region. Recco flights kept the hurricane pin-pointed as it moved and gathered reliable data.



This SB2C is mounted for test in the full-scale wind tunnel at NACA's comprehensive research station at Langley field

Another Navy first during 1947 was the launching of the V-2 bombardment rocket, shown rising from deck of the *Midway*

Aerology Radios New Storm Maps

Aerology is like a house girder—not always in view but indispensable to safe and successful operations. Progress in 1947 included the following:

Development of radiophoto and facsimile transmission of weather maps became an accomplished fact. Up-to-the-minute pictures of the weather from China coast to Washington now are available over a radiophoto network tying in long-range transmitters at Guam, Pearl Harbor, San Francisco and Washington, D.C. Maps can be ready 20 minutes after they are delivered for radio transmission.

Progress was made in instrumentation for gathering upper atmosphere data—from 50,000 feet and up. During 1947, 2,000-gram balloons were produced which can attain 100,000 feet and carry meteorological instruments to that height.

Many air stations received photoelectric ceilometers which automatically measure and continuously record the height of cloud ceiling over an air field with absolute accuracy.

One of aerology's prize 1947 projects, from a public standpoint was *Project Cirrus,* making rain by sowing particles of dry ice in supercooled cirrus clouds. The project is a joint one with General Electric and the Air Forces.

Military possibilities of being able to produce snow or rain in a hurry are boundless, both to cloak friendly operations or to confound the enemy. 'Seeding' of clouds may be able to open up cloud-cover over specific fields or carriers to permit landings, or to divert hurricanes.

NATS—

During 1947, NATS was a stable, peacetime operation, with 116 planes and personnel as high as 6,400. Its peak transport operation was in July when 2,067,557 miles were flown and 9,451,448 ton-miles lift attained. Just as a little sideline, NATS ferry pilots during June flew 1,000 planes to other parts of the country.

NATS points with pride to its 1947 record of not a single passenger fatality. This despite the fact it flew 40 million passenger miles every month. A large part of the credit for safe operation goes to its continuous use of GCA. NATS pilots are ordered to practice a GCA simulated instrument approach at every landing where equipment is available.

An additional safety measure which NATS started using in 1947 is radar obstacle warning equipment in every transport plane. It permits pilots to "see" via radar dangerous storms or more solid obstacles when visibility is zero.

During the recent Egyptian cholera epidemic, NATS flew five tons of serum and medical supplies within 24 hours after the Egyptian government asked the U.S. for help.

EXPLORATION—

Naval Aviation participated in three expeditions during 1947—the Antarctic exploration of *Operation High Jump,* the Bikini Scientific Resurvey and an Arctic weather project.

Most important was the Antarctic operation, with R4D's, helicopters and PBY's playing active roles. The expedition planes flew over 340,000 square miles of ice-bound land never before seen by man and 75,000 square miles of ocean.

Navy photographers recorded topographical features of the vast sub-continent on 64 flights. For the first time, the nature of the rock under the ice cap was revealed by the airborne magnetometer, the weapon used to detect submerged submarines during the war.

Of most value to naval aviation, however, were the data secured from making these flights—know-how that can be gotten only by actually flying under sub-zero conditions.

A helicopter flying off the icebreaker *Edisto*, charted the best course for the ship in the Arctic project. At Bikini, a *Catalina* flew a shuttle run six days a week from Kwajalein.

RESERVES—

A single cold statistic tells the story of the hot expansion record chalked up by the Naval Air Reserve in 1947. In June, top month for the year, 122,075.3 pilot-hours were flown. Contrast this with 18,223.6 hours flown in September, best month in 1946, and you can see the tremendous strides made by the program during 1947.

Or contrast this total with the 274,380 hours flown by all regular Navy pilots during the same month in 1947 and you get an idea of the Reserve's part in Naval Aviation.

The number of men in the Naval Air Reserve also grew immensely during 1947. Between July the past year and year ago, Organized Reserve officers went up from 2,967 to 7,229 and enlisted men from 339 to 18,390. Other branches of the Air Reserve went up correspondingly.

During the year Denver, Akron and the LTA Unit at Lakehurst joined the line-up of 18 air stations and 5 NARTU's now under the Naval Air Reserve Training Command. The scope of Reserve activity was further extended by a network of eleven Naval Air Reserve Auxiliaries, located at Brunswick, Charleston, Buffalo, Birmingham, Tampa, Salt Lake City, Reno, Phoenix, Amarillo, Tulsa, and the Hutchinson-Witchita area. These NARA's provide flight facilities for Associated Volunteers.

The training program for Air Reservists successfully underwent its shakedown period early in the year. By June it was fully geared to handle the heavy activity when the majority of Reservists reported aboard for their annual two-weeks cruises. Individual squadrons are now undertaking more and more training responsibility.

Marines Reserves held the first nationwide aerial maneu-

NAVY HELICOPTER HOVERS OVER ICE PACK ON ANTARCTIC EXPEDITION

NAVAL AIR RESERVE GREW DURING 1947 TO A SMOOTH-WORKING, WELL-ORGANIZED ACTIVITY; THESE HELLDIVERS FLEW FROM NAS OAKLAND

vers in August and September when their fighter and ground intercept radar squadrons flew to El Toro or Cherry Point to test the speed with which they could be mobilized. It took only one day to get them to Cherry Point and three to more-isolated El Toro.

The year saw a great number of Volunteer Air Reservists coming out to share in Organized activities in an "associate" capacity. To encourage further interest in Naval Aviation among Volunteer Reservists who are not associated with active units, a new program has recently been undertaken. A naval aviator has been assigned to advise each district commandant on this phase.

Significant contributions have been made by Air Reservists during local disasters, such as the Texas City explosion, the September hurricane and the Missouri valley floods.

Another significant development in the Naval Air Reserve during 1947 was the issuance of a Reserve edition of NAVAL AVIATION NEWS, starting in May. Ever since the war was over, pilots and others who had been connected with Navy flying wanted to keep in touch with developments and maintain their interest in the Reserve.

The unclassified edition of the NEWS furnished the Reserves with a medium of reaching these men. It is available by subscription for $2 a year from Superintendent of Documents, Government Printing Office, Washington, D. C.

AIRCRAFT EQUIPMENT—

The Navy changed the looks of its airplanes from the outside during 1947 and also made plenty of changes inside. With the increase in speed, steps had to be taken to insure the safety of the pilot. Practically all new fighter planes have ejection seats to blow the pilot out in an emergency.

Work is going ahead on detachable nose sections for jets, but since today's planes for the most part are in or under the 600-mph class, ejection seats probably can handle the job. The British proved they would work up to 500 mph, when they ejected a man in his seat at that speed.

Other mechanical improvements during 1947 included booster controls using hydraulic or electric power to enable a pilot to work his ailerons and rudder when his muscular strength is insufficient.

Power-operated controls also were under development. Work was being done on an "artificial feel" so the pilot could tell how much pressure he was putting on his control surfaces.

All present attack and VF planes are coming out with stronger seats, built to stand 40 G's. Retroactive installation was made in fighters with present seats of less strength.

Navy planes are flying faster and methods of refueling them also are being speeded up. Planes now get gas from trucks at the rate of 50 gallons a minute. New fueling systems under development in 1947 deliver from 200 to 400 gallons a minute via under-wing refueling points.

CHEMISTRY—

Aviation chemistry also reported progress during 1947. Probably the biggest step came when tests were completed on a new non-inflammable water-base hydraulic fluid for airplanes. Many a plane was lost during the war because its petroleum-base fluid caught fire when hit by AA.

Another forward step was development of a synthetic low-temperature grease that will not break down or evaporate under frigid conditions of the Arctic or high altitudes. This is being used for control surface bearings, motors, generators and actuators used in aircraft.

Paint as a protector of aircraft surfaces went ahead in 1947, with the following developments:

1. Production of an adhesion-testing device to see how well paints will stick on metal surfaces. The device will turn up 2,000,000 rpm.
2. A supersonic testing device for studying effect of air impact on paint coverings on leading edges of wings.
3. Water-tolerant primers and paints which will dry quicker in moist, humid air. This was a dollars-and-cents saving by doing away with buying air-conditioning equipment.
4. Heat-resistant paints for use on jet aircraft, engine exhausts and other places where extreme heat is met.
5. New synthetic resins which, when mixed with paints, will make them adhere more strongly to aluminum surfaces.

SUPPLY—

The Aviation Supply Office, Philadelphia, a war-developed, supply-demand control point, is delegated the responsibility for procurement, distribution and control of aeronautical material. This system worked so well during the war that it has been used as a pattern for the "Navy Supply System," approved by the Secretary of the Navy in February, 1947.

The ASO has disposed of large surpluses of aviation material for which there will be no need. It has replenished stocks of required aeronautical spares by cannibalization of excess aircraft and engines. In addition, it has established a system of depots, major, and specialized supply points for aeronautical materials to place stocks of material where it is needed. By this system, material will support operational and maintenance programs with "enough where needed" and not "too little, too late," as was sometimes the case.

1947 NAVY AVIATION

New Arctic Gear To Defeat Cold

PROCUREMENT is underway on Arctic flight clothing to replace the heavy leather type now in use. Tested on *Operation High Jump*, the new clothing features an alpaca-lined jacket and coveralls, and wool-lined trousers. It is for issue only to personnel operating in extreme weather outside of continental limits of the U. S.

Another development was plastic crash helmets for jet squadrons formed during 1947. The new helmets, illustrated to the right, are to protect them from buffeting about the cockpit and in the event of low-impact crashes.

Several new aircraft instruments were brought out to keep a pilot informed of what his plane is doing. The capacitor fuel gage represented a big step—abandoning measurement of gasoline in gallons in favor of tabulating it in pounds.

Other instrument developments in 1947 included:

1. A new compass, the G-2, installed in the *Skyraider*, *Mauler* and jet fighters. It features a slave directional gyro and supersedes the P-3, a light-weight version of fluxgate compasses used in P-boats during the war.

2. An all-electric, self-synchronizing auto pilot, the P-1. First production installations were made in 1947 in P2V-2's, F4U-3's and other night-flying planes.

3. A maximum allowable airspeed indicator. This has a red arrow to show the straight-and-level flight limit of a plane.

4. A percent-type tachometer. Instead of showing RPMs an engine is turning over, this instrument shows the percent of turnover as compared to the maximum allowable for the engine. This was designed for gas turbines and turbo-jet engines and its dial shows figures from 1% to 100%.

Keeping pace with development of high speed planes, the parachute experts produced a chute which has functioned successfully at 430 knots, twice the speed existing chutes are designed to withstand. The new design incorporates a section in the top of the chute on elastic ribs.

All fleet unit gas trucks were equipped with new filters and segregators to deliver cleaner gasoline. Jet engines must have less water and dirt, but the problem took two years of laboratory experimenting and research to solve.

BEARCAT AND CORSAIR BECAME MAIN SHIPBOARD FIGHTERS IN 1947

NEW WINTER FLIGHT GEAR (LEFT) AND NEW JET PILOT CRASH HELMET

Another BUAER development is a new carrier tractor design incorporating four-wheel drive and four-wheel steering. The new, lower tractor can be handled more easily for spotting planes and maneuvering around a flight deck.

PILOTLESS AIRCRAFT—

During the past year the pilotless aircraft program of BUAER emerged from the study stage to development.

Following results of research by many aircraft manufacturers, universities and government activities, five development contracts for attack-type missiles were established. In addition, development of a surface-to-air, and two air-to-surface pilotless aircraft was continued. These eight projects consist of one in the surface-to-air class, two air-to-air, two air-to-surface and three surface-to-surface.

To implement and assist in development of attack missiles, there are a number of non-tactical special purpose and test vehicles. These include the *Loon*, the *Gorgon*, the *Gargoyle*, and the meteorological rocket. These vehicles are used to test performance of various types of power plants, guidance and control systems, launchers, to obtain high altitude meteorological data.

During 1947, BUAER progressed in development of pilotless aircraft for target use to keep pace with constant demands for higher speeds and altitudes and greater maneuverability. The bureau had developed to a near-completion state the first automatic pilot for use in target drones.

Among the events of interest during 1947 are the 11-minute sustained flight of the *Gorgon IV*, a new duration record for ram-jets, and V-2 launching from the *Midway*.

PHOTOGRAPHY—

Photography moved forward in 1947 under impetus of the Jet Parade, the same as other phases of aviation. The 36 projects underway ranged from solving a light leak problem in a shutter design to developing a 70 mm. aerial camera and a camera for submarine periscopes.

Developments in guided missiles like the V-2, in drones and in piloted aircraft have outmoded many existing, heavy cameras and new ones are being studied. These may be remote-controlled, automatic cameras with faster shutter speeds and of less weight.

Some of the projects developed during 1947 included an automatic radar recording camera, semi-automatic titling of negatives and prints, new-type copy camera, lighter spark-lamp type flashguns, and improved aerial camera.

BUAER also is working on an aerial camera magazine with moving film to offset image movement, three-dimensional pictures and a lab device for rapid precision analysis of light transmission characteristics of lenses, film and filters.

NACA AND NAVY COOPERATED IN DEVELOPING MISSILES LIKE THIS

CATAPULTS—

The first Navy catapulting was in 1912 when Lt. T. G. Ellyson, No. 1 Naval Aviator, was launched at 35 mph in his Curtiss plane. Progress has been continuous since then, with 1947 no exception in bringing out new improvements.

Although not for launching aircraft, one of the most interesting developments was the HG-1, a high-acceleration catapult for testing aircraft components and physiological studies of persons. Nearing completion for installation at Philadelphia, the HG-1 is designed to impart 60 G accelerations. Since no person can survive such a force, lesser jolts will be used when a person is launched. The car will roll down a 300-foot runway on the field and be stopped by arresting wires.

Also at NAMC, the H8 catapult is being built for installation on the CV *Oriskany*. It will launch the heaviest carrier based planes now in development and will replace the H4-1 catapults, such as now are installed on *Midway*-class CVB's. The latter can launch an 18,000-lb aircraft at 90 mph.

Design is underway on the H9 catapult, with NAMC authorized to build a working model. It will launch a 45,000-pound plane at 105 knots.

Work also went forward on slotted-cylinder type catapults such as now are used to launch missiles like the *Loon* (V-1 buzz bomb) at Point Mugu. The XM-1 and XM-2 were installed there for test use. A catapult used for testing arresting hooks, the XC-1, went to Chance-Vought for testing.

ARRESTING GEAR—

The problem of how to make a barrier arresting gear that will engage tricycle landing gear planes and one strong enough to stop heavier and faster carrier planes is still short of a final solution. During 1947 BUAER continued its research into the problem and began installing an adapter for present barriers until a better one comes along.

The new CVB's with their armored decks and nonskid sandpaper-like covering strips present another problem. Arresting gear pendants and purchase cable wear out at a fast clip—another task for BUAER and BUSHIPS.

Several squadrons of *Bearcats, Helldivers* and *Avengers* tried out a new, detachable point for arresting hooks on planes. Made of extremely-hard Hadfield steel, the points can be replaced when worn without necessitating removal of the whole five-foot hook.

ARMAMENT—

New developments were reported in aircraft armament during 1947. Among them was a new torpedo nose cap release. It snaps off and releases the cap of torpedoes carried externally on AD and AM planes. Another improvement is a container for handling eight miniature practice bombs. It is suitable for suspension from bomb racks and shackles having suspension hooks on 14" centers.

Other improvements included:

1. Portable manual bomb hoist, improving on the Mk 8 to incorporate free reeling, quick rewind of cable and overload slip clutches on hand cranks.

2. Electric bomb hoist similar to above with easy removal of motor for conversion to manual operation.

A banner target carrier for releasing banners in flight instead of dragging them off the deck has been recommended for production, as have small three-plate snarl catcher and a target release ring Mk 8.

The first twin 20 mm. tail and nose turrets have been approved and released for production. A stabilizing unit has been approved for use on the P2V and P4M deck turret to aid tracking.

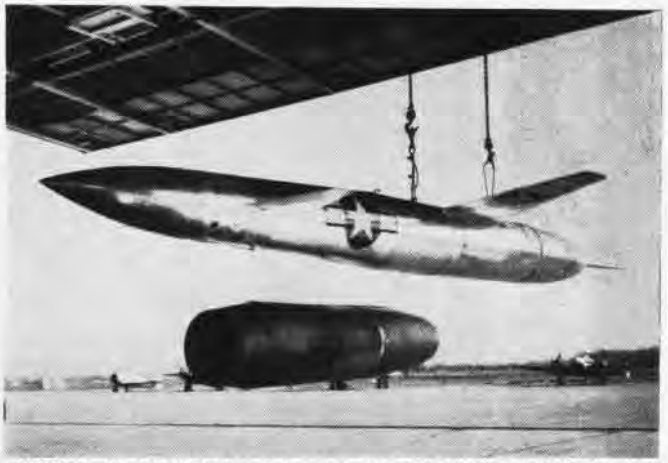
ELECTRONICS—

When the Navy brings out new, faster planes, it has to develop better radar, radio, communications, navigational aids, countermeasures, electrical, pilotless aircraft guidance and control systems to go along with them. Much was done during 1947 to reduce weight of existing airborne equipment, plus better design for better performance.

Electrical systems of naval aircraft have been changed from direct current to predominantly alternating current. In addition to higher capacity output, the electrical systems are undergoing complex improvements as automatic controls and protective devices are introduced and electrically-operated devices replace old-style manual operation.

Continued coordination with the U.S.A.F. resulted in a program for improvement of joint communications. The development of a new airborne radar as an aid to air navigation has aroused great interest in commercial aviation.

HELICOPTERS, OPERATING OFF AV'S, ESTABLISHED SELVES WITH FLEET



GORGON IV MISSILE SET THE RAM JET DURATION RECORD IN 1947

GRAMPAW PETTIBONE

The Rover Boys In China

The flight of eight Marine *Corsairs* started back to base after having maintained a simulated combat air patrol over a task force for a period of three hours. The planes had sufficient fuel for 75 minutes of flight and the return to base was not expected to take more than half an hour.

Just off the China Coast the flight encountered a well-developed frontal storm which extended to the right and left of the course as far as the pilots could see. The bottom of the front was right down to the water, obscuring the coast line and the coastal mountains. The flight leader made a 180-degree turn and started a climb in an attempt to go over the top.

At 5500 feet he could see that the top of the storm reached up to approximately 25,000 feet, and decided that it would be impracticable to go over or around the storm with the limited supply of gasoline. At this time the base was reporting a ceiling of 8000 feet and good visibility, so the leader made another 180-degree turn and entered the front on an approximate heading of 255 degrees.

Three of the eight planes became separated from their divisions in the turbulence and low visibility. One pilot turned around and flew back out of the front and eventually ditched his F4U near the task force. Another took up a heading of North and held it for thirty minutes, because he heard one of the pilots say that he was on that heading at 8000 feet and in the clear. Unfortunately this heading took both of them some 90 to 100 miles Northeast of the base and kept them in the front for a long time as they were flying nearly parallel to the squall line.

These two lost birdmen finally broke out in the clear at a much greater distance from the base than they had been when they first entered the storm. Worse than that—the storm was still between them and home. After sighting each other they established voice radio contact, but were confused as to their probable position and for the next fifteen minutes they continued to fly away from the base. Finally they reversed course and one of the pilots oriented himself sufficiently to take up a heading for home.

At about this time the other pilot

called and said that he was out of gas and was landing on the beach. Shortly afterwards he called again, stating that he had made a successful landing, but that the Chinese were firing at him. He was taken into custody by the Chinese Communists. Subsequent reports say that he was eventually released, and returned to his base.

The second pilot had enough gasoline to continue to within twenty miles of the airfield where he again encountered the frontal weather. With just a few minutes of gas left, he ditched his plane in a lagoon and drifted ashore in his life raft a couple of hours later. He shouted "Hello" in Chinese several times and on receiving no answer decided to look for a place to spend the night. He finally crawled into a small Chinese temple and fell asleep. The next morning he met some friendly Chinese who provided him with a mule and after a five-hour ride he reached Tsingtao.

Grampaw Pettibone says:

***Esprit de corps* is a mighty fine thing to have in any outfit, but I don't think it should be stretched to the point of sending in accident reports like these with the words "NONE" written in the space provided for noting "Errors of Pilot or Other Personnel."**

I'm inclined to believe that a goodly portion of the error should have been assigned to the Flight Leader as there is no indication that he took even a minute or two to brief the flight before taking them into the instrument weather. I think this makes a tremendous amount of difference. The flight leader should think about the reaction of his most inexperienced pilots.

By taking a few minutes to explain to the flight that the weather at the base is good, and that they will in all probability be through the front in a matter of ten minutes, he prepares the less experienced pilots for what lies ahead. Then, given a course and altitude to fly, the chances are much greater that they will come through without any serious trouble.

In my opinion these pilots, who became lost, went on instruments without having the benefit of this psychological preparation. I think that if their morale had been given a boost in the form of a two minute briefing, they would probably not have become so confused as to turn 90 degrees off course and end up with the storm still between them and the base.

Of course, it is a little difficult to understand how they came to the conclusion that they were southwest of the field after altering course from 255° to 000°, but you can get a lot of screwy notions when you've just had the living daylights scared out of you, especially when you see that gasoline gauge getting uncomfortably low.

The worst fear is *fear of the unknown*. Get the word around, and the roughest flying will be a little easier, and a good deal safer.

Dear Grampaw Pettibone:

Most Navy pilots won't run into this, we hope, but this incident illustrates why untrained pilots should stay away from these Western Pacific typhoons. The excerpts quoted are from a letter written by one of our more capable PPC's operating from a detachment.

"Did you hear about the one I flew with a VIP aboard? Well, to begin with, it was just a weather recco, supposedly, and he came along for a nice flight. 'CAVU and all that,' he said. We were out less than 200 miles when we ran smack dab into it. It was a dilly (*Mildred* to be exact, with winds of 100 knots or better). About one-third of the way around he asked, 'When do we return to base?' I was busy and didn't let it bother me.

"Somehow I got into the thing too far. The co-pilot was flying manually at 500 feet as the plane had a badly-checked windshield on my side, and I practically had to stick my head out the window to see anything.

"As I said, we got in too far. The

winds got too high. The air got too rough. I said 'Let's turn down wind.' Suddenly I felt the plane shaking and noticed my air speed reading 105 knots. The radio altimeter was reading around 150 feet and moving downward. The co-pilot's pressure altimeter read 1000 feet and mine read 900 feet. I shouted to pick up airspeed as I increased the power and RPM and looked out to confirm the reading of the radio altimeter.

"I confirmed it all right by staring at a tremendously large white wall of water coming right at us. I think we missed the crest of that one by a good foot. We staggered back up to about 700 feet and discovered that the airspeed indicator on the co-pilot's side had stuck at 130 knots. That made Christians out of all of us, including the VIP, and we stayed well out in the 50-knot circle the rest of the way around. As the saying goes—'I learned about flying typhoons from that ——.'

"Late last month some of the boys in our squadron who had flown winds in excess of 100 knots formed *The Century Club*. *The Century Club* lasted two days as *Olive* and *Rosalind* became more difficult. It was supplanted by *The Christian Club* and the members began to refer to themselves as "the 60-knot pilots" and "the 50-knot boys." Despite this voluntary reclassification, they were consistently reporting winds of 100, 110, and 130 knots and were returning to base with elaborate explanations of how it happened to them.

"I thought that you might like to know, Grampaw, that the Pacific typhoons were just as wily as ever and that even pilots trained to fly typhoons were still being surprised by them.

Respectfully,

COMMANDING OFFICER."

Grampaw Pettibone says:

Many thanks for this interesting letter. Just looking at the pictures that you enclosed was enough to scare me. Wish I could print some of them but I'm afraid they wouldn't show up very well in one-column cuts.

Winter Safety Hints

Grampaw Pettibone says:

A hasty review of the accidents which occurred most frequently last winter, shows that the great majority were preventable. Follow the winter safety rules below and stay out of Grampaw's accident file.

1. Demand all the available weather information before every flight. Plan your flight to *avoid altitudes where icing is prevalent.*

2. If you should encounter instrument weather while on a Visual Flight Plan, DON'T PUSH THROUGH. This caused nearly one-third of all the fatalities last winter. *Land* at the nearest airport where *contact conditions prevail.*

3. If you are flying over water, know your emergency rescue procedure, and wear an exposure suit. You won't last long without an exposure suit in water of or near freezing temperature.

4. Just before any take-off, be sure to check all controls for free movement, and clear your engine thoroughly. Never take off with snow or frost on the wings. A very small amount can destroy your lift.

5. Check the runway conditions with the tower before landing. Icy spots on runways caused many groundloops and nose-overs last winter.

6. By all means learn the correct way to operate every piece of de-icing equipment on your airplane *before* you get in the air.

7. Don't let ice in the pitot tube foul you up. Use the pitot cover when securing the aircraft. Use pitot heat in freezing or near freezing weather.

8. Brakes are of little help when taxiing on icy areas. Taxi SLOWLY and allow yourself a large stopping distance.

Dear Grampaw:

Your excoriation of a JRB pilot who corrected for a strong cross wind by "bending" upwind throttle was not completely justified. Since the JRB is little more than a light double-breasted SNJ with sensitive and immediately effective aileron controls, the proper and recommended corrective cross wind action, requiring the least throttle jockeying, on the approach would be the same as the method employed in the single engine equipment, i.e., by dropping a wing and slipping into the drift and/or crabbing into the wind or a combination of both. In that sense your upbraiding can be concurred with.

However in heavier, multi-engine equipment, R4D's, R5D's, etc., upwind engine, used judiciously, is just as right as adding ice to anteprandial liquids. You can take it or you can leave it alone. The point I want to make is that IT DOES WORK.

Control pressures are relatively heavy in R4D's and R5C's and at the slower speeds of a final approach the reaction to aileron movements tends to be sluggish. It is sorta like sitting on the front porch and flying a house. Even so, you don't HAVE to use up-wind engine at any time in a cross wind condition but it is a nice little trick to further demonstrate one's aplomb as a skygoing wayfarer.

Don't just take my word for it. Borrow a two-engine aircraft some day and adjourn to an authorized low flying area where you won't be violating Article 6-206 of the *BuAer Manual*. Get low enough to the terrain so that you can definitely notice drift and carry out this recipe:

1. Pick a road, fence, or any demarcation on the ground representing a straight line which is about 90° to the wind direction. Hypothetically let that line represent your approach line to the runway.
2. In normal flight your aircraft will drift from the line. You correct and stay over the line, in single engine equipment, as follows:
   a. By lowering a wing and slipping into the wind.
   b. By crabbing into the wind.
   c. A combination of *a* and *b*.
3. With a two-engine plane, however, there is the additional advantage provided for correcting for the drift by slipping to the wind with the wings perfectly level. This is done by an application of power on the upwind engine. Assuming now that the wings are kept level, with upwind power added, the nose of the aircraft will tend to turn down-wind. BUT keep the nose headed straight down that hypothetical approach line with rudder and you will be slipping or skidding (either word is correct in straight flight) into the wind. The wings are level, the nose is straight.

The trick is to use just enough of this power slip (which is, in effect, what it is) to counteract the drift. It requires technique and much practice to learn just how much power is required to correct for a given cross wind condition BUT IT DOES WORK and after the imperceptible transfer from air to ground there is that desirably requisite assistance, you mentioned, that prevents the plane from weathercocking into the wind.

Grampaw Pettibone says:

Sounds to me like you've got something there, young feller. I went right out to the Air Station and tried to borrow an R4D, but they wouldn't let me have one—said my beard would get all tangled up in the yoke.

By the way, if you're ever in Washington stop in and see me and I'll mix you an "anteprandial" concoction that will curl your hair. As for the rest of you, get out your dictionaries.

FAMOUS LAST WORDS

"You just put the weather on it, brother, I'll fly it."

A Thousand Pardons, Suh!

From Atlanta comes word that the SNJ pilot whose flight was written up in the November issue under the title, "SOME RIDE, EH?", was not a member of the Naval Air Reserve Training Unit, but a regular naval aviator getting his time in there. This was a mighty sorry ride and Grampaw apologizes for pinning it on the wrong outfit.

course, were the flight action scenes which showed squadron flying formations, dog fights, touch and go, simulated bombing and carrier landings.

To record the program one camera was mounted in an R4D, one on the tower, and three were placed at strategic places on the ground. The fading of one scene shot from the air into another taken from the ground and the constant shift from one camera angle to another for the most interesting shots required perfect timing.

The fact that the whole program ran off without a hitch was no idle accident. Six weeks of solid preparation preceded the actual televising. Special antennas had to be erected, special power units had to be installed in the plane, and many other technical requirements had to be met. A shooting script had to be outlined, equipment and planes had to be made ready, and pilots and enlisted men had to rehearse their assigned parts. The success of the show was due to the fine teamwork between Reservists and television personnel all along the line.

We "Dip Our Wings"

To NAS NEW ORLEANS—*On being the first station in the country to reach 100% of its Organized Reserve quota.* This drive, begun on 5 October, went over the top in time to celebrate Navy Day. SecNav Sullivan, shown in the picture below with Capt. Leeper, C. O. of NAS New Orleans and Rear Adm. Reifsnider, 6 ND Commandant, swore in the last recruit.

To NAS SQUANTUM—*on the many flights made by Reserve pilots over forest fire areas in Maine, New Hampshire, and Massachusetts.* Carried on these flights were personnel and special equipment.

To NAS MIAMI—*on the fine work of the communications department during the October hurricane.* Approximately 80 to 200 messages were handled daily during the ensuing period when it was necessary to operate on emergency CW circuits. The department received a commendation from ComSeven for maintaining rapid communications with district headquarters.

COMMISSIONING OF THE AVU(A) AT CHARLESTON

Navy Day Review

Nothing daunted by the curtailment in air shows, the public put in its customary interested appearance at Navy Day activities.

NAS GLENVIEW welcomed some 33,000 visitors. Thirty-two planes, flown by Reserve pilots swept in from a fly-over of surrounding communities and topped off the celebration with a "limited" air show. More than 30,000 guests, attracted by the all-out publicity via posters (3,000), folders (20,000), car cards, radio and press announcements, turned up at the NAS MINNEAPOLIS open house. The *Truculent Turtle* was the most popular display. Eighty-four planes took part in the NAS GROSSE ILE Navy Day celebration attended by about 24,000 persons.

Out in Seattle one newspaper reported that two Marine Reserve pilots from the NARTU "led a crowd of 10,000 people in deep breathing exercises" as they executed their precision flying maneuvers at the station open house.

To intrigue the spectators at the NAS DENVER festivities, a division of *Corsairs* staged a balloon-bursting contest. There was great excitement as the planes zoomed after the 12 colored balloons, each filled with helium and about three inches in diameter, which were rising at about 800' a minute.

"Weekend warriors" from VF-69-A, VF-70-A and VA-69-A at NAS OLATHE flew in parade formation over towns from Kansas City to Topeka and then made a simulated attack on their home field to thrill the 4,500 visitors.

At Anacostia, NAS and NARTU personnel pooled their efforts at open house activities, which were televised by NBC and which included simulated landing and air coverage flown by Reserve pilots.

Equally successful celebrations were reported by other stations and units within the Naval Air Reserve circuit, with reservists, for example, giving Atlanta the biggest Navy Day in its history.

Station Round-Up

NARTU JACKSONVILLE—As an advance salute to Navy Day VF-52-L pilots in 16 *Corsairs* and *Hellcats* received an electrifying response from the spectators at the Florida-North Carolina football game as they formed a "UF" and then an "NC" in their flights over the stadium.

NAS LOS ALAMITOS—The foundation for an unofficial Photo Group was laid at a recent meeting of all O. R. photo personnel. It is now planned to schedule one regular squadron drill and one consolidated group drill per month.

NAS NEW YORK—Led by Lt Cdr. A J. Denman, VF-68-E Reservists paid homage to the first W. W. II dead returning aboard the *Joseph Connelly* by circling the ship in 16 F6F's.

NAS COLUMBUS—Score a 4.0 for interest which is being shown in the supply classes held on Thursday and Friday evenings.

NARTU LAKEHURST—As of November, 65 officers and 103 men were attached to ZP-51.

NAS MEMPHIS—Two F6F's, equipped with 150-gallon spray tanks, performed extra duty in spraying DDT over the Naval Ammunition Depot at Shumaker.

NAS ST. LOUIS—Three physicists from Washington University were flown for four hours in a station R4D, testing cosmic ray counters as part of the research being conducted under the sponsorship of the Office of Naval Research on the cosmic ray.

SECNAV CONGRATULATES THE O-2 WHO FILLED THE NEW ORLEANS QUOTA

ONE OF FOUR $8,000 CAMERAS WHICH TELEVISED WILLOW GROVE SHOW

SKYROCKET POSES QUESTION: HOW STREAMLINED CAN AN AIRPLANE BE?

AIRSCOOPS CAN BE CLOSED FOR EVEN MORE STREAMLINING IF DESIRED

JET SKYROCKET

THE "NEW LOOK" in aviation was modelled by Douglas at its El Segundo Plant the other day, when the public saw the Navy's *Skyrocket* for the first time. The new rocket and jet propelled D-558-2 features sweptback wings and tail, a needle nose and an aerodynamic configuration streamlined to near projectile shape.

Like the modern women's styles, many of the features incorporated into the latest research plane date back into early aviation history. The swept-back wing design goes back to the first war; tricycle gear was tried in some of the earliest aeroplanes the thin wing was used on all of the first planes; Handley-Page slots are old stuff, and the cathedral angle (negative dihedral) was turning up as early as 1911 in "new" designs. All of these items are found in the *Skyrocket*.

Anyone will admit that the "new look" in fashions may date back to the turn of the century, but somehow there is a difference. The same applies to the various "old" features on our most modern plane. These components may not be new, but together in the D-558-2, they are new. Nearly all have to do with eliminating drag, or cutting down compressibility effects.

The use of the sweptback wing and tail is one method of increasing the upper speed limit by a substantial amount over the maximum speed of a straight wing. The wing is a very low-aspect ratio type, but is a conventional air foil and not the sharp-edged supersonic air foil. The purpose of the *Skyrocket* is to explore the top speeds of this type of airfoil, at the same time retaining relatively normal low-speed characteristics.

The combination of a turbo-jet engine and a rocket motor gives the *Skyrocket* a wider test range and makes it independent of auxiliary power or parent planes. The turbo-jet will provide sufficient power for take-off, landing and climb to test altitudes. The rocket motor will provide the power needed to drive the plane at high research speeds. A great deal of thought was given to omitting the turbo-jet engine and using a mother ship to carry the D-558-2 to a higher launching altitude as in the case of the XS-1. However, it was decided that independent operation was more desirable than a slight additional increase in speed.

Power plants and fuel systems were arranged with extreme care in order to distribute fuel uniformly about the C.G. This will keep trim changes to a minimum while fuel is being used up.

The structural arrangement of the *Skyrocket* is similar to that of the *Skystreak*. Magnesium alloy was used for the greater portion of the fuselage; the wing and tail surfaces were constructed largely of 75S aluminum alloy.

Handley-Page leading edge, automatic slots give the sweptback wing better low-speed lift characteristics. Due to the wing sweep and insufficient space, both the fuel and tricycle landing gear are housed in the fuselage, making the *Skyrocket* somewhat fatter than the D-558-1 though still not a "heavy."

COCKPIT CONVENTIONAL BUT NOT TOO ROOMY

The nose of the fuselage is jettisonable as a means of high-speed pilot escape. Drag brakes are provided on the after portion of the fuselage for control of drag or speed. The cockpit is pressurized and equipped with refrigeration and heating equipment just as is the *Skystreak*.

Three types of instrumentation are installed in the *Skyrocket* in addition to the pilot's normal flight instruments. For the most part the instrumentation is developed by NACA. It includes a photographic set-up for recording on motion picture film the reading of a battery of flight instruments; pressure measuring system automatically recording air pressure measurements at 400 points on the wing and tail; control forces and stresses in the structure are measured by 904 electric strain gages and automatically recorded by an oscillograph.

The rocket has four cylinders which can be fired singly or together. Speed will be controlled by the number of cylinders used at one time. The test run itself will be no more than a couple of minutes long in most cases. During the short period the rocket motor is in operation, one and one half tons of rocket fuel will be burned.

The *Skyrocket* marks one more step in the slow arduous battle for speed.

MCAS CHERRY POINT—Something of a record was set here recently when four majors were awarded a total of 10 DFC's and 27 air medals. Maj. John Sigman was presented with five DFC's and 11 air medals; Maj. Frank Collins with two and eight, respectively; Maj. Louis Frank, two and six, and Major Moran one (his second) and two (his second and third).

VP-MS-3, KANEOHE—Twelve petty officers have been taking civilian pilot training at a small commercial airport just outside the station gates. The course is supplemented by a course in basic navigation given by the squadron twice a week after working hours. The course itself was so popular eight additional non-flying personnel attended.

NAVY FLIES FIRST RAM-JET PILOTLESS AIRCRAFT

THE RAM-jet is the power plant nearest to none—so far as appearance goes. It looks like an old fashioned stovepipe with a gas burner grate installed where the damper should be. The Naval Air Missile Test Center out at Point Mugu is combining this power plant with a pilotless test vehicle—and the thing flies. Best flights to date have been made with the subsonic propulsion test vehicle, the Gorgon IV. It has made several successful flights, one of over eleven minutes duration. Performance on these flights has been better than expected.

Heretofore, ram-jet tests have been restricted to captive operation in laboratories, free-falling bodies and wingless missiles. Until the Gorgon IV flew late last year, no winged vehicle powered by a ram-jet had successfully flown in America.

The C-20.85C ram-jet which powers the Gorgon IV was designed and constructed by the University of Southern California, and was ground tested under the supervision of the University at the BUAER Fontana ram-jet test facility.

The Gorgon IV is a Glenn L. Martin design. It is a medium-sized pilotless aircraft of 1589 pounds gross weight. Twenty-one feet, eight inches long, it has stubby wings of 10-foot span, and is about 52 inches in height. Suspended beneath the fuselage by a pylon is the C-20.85C ram-jet. As shown by the designation, the ram-jet is 20 inches in diameter and is designed for best operation at a Mach number of .85. At sea level, the jet will deliver 1500 pounds of thrust at Mach .85, with lesser thrusts produced at increasing altitudes. One hundred and sixteen gallons of 73-octane gasoline, enough for a 10-minute flight, are carried in the center portion of the fuselage; the

WITH THIS ENGINE IT FLIES AT OVER 640 MPH

nose section contains an autopilot, a 15-channel telemetering unit and a parachute for the bird's recovery.

The Gorgon IV is controlled in yaw and pitch by a conventional rudder and elevator system, but uses spoiler ailerons for lateral control. The spoiler ailerons are located in the outboard panels of each wing and, as the name indicates, are lift-destroying devices. When a wing drops, the spoiler aileron of the opposite wing extends, disrupting the airflow and erasing part of the lift of the high wing.

Speed control of the vehicle is not obtained by a throttle adjustment, but is set into the control system prior to flight. The desired Mach number is maintained by drag brakes located in the aft portion of the fuselage which automatically extend and retract, holding the pre-set speed.

Since the ram-jet will not operate unless it is moving through the air at considerable speed, the Gorgon IV is carried aloft beneath the wing of a parent P-61 airplane, and is launched at Mach .5. This speed is somewhat higher than necessary for operation, but it is only at this point that the thrust of the jet overcomes the drag of the bird, thereby allowing the missile to accelerate when released.

Nineteen Gorgon IV vehicles were constructed for the flight test program which has, as its broad, overall purpose, the collection of the free flight ram-jet operating data at altitudes ranging from sea level to 30,000 feet, and at Mach numbers up to .85. These data, when collected and analyzed, are expected to be of considerable value for future design of ram-jet powered missiles.

However, since all components of the Gorgon IV as well as the jet must function perfectly, the first free flights are actually being primarily directed toward discovery and elimination of any operational difficulties which may arise. Then, when it is assured that the missile will fly successfully, all effort will be concentrated on obtaining the ram-jet operating information. These desired operating data will be relayed to a ground station via the airborne telemetering unit.

To date, all of the flights of the Gorgon IV have been made during the first phase of the program—to ready the bird operationally. The first flight of the bird was not successful, the missile going into an uncontrollable roll shortly after launching. Telemetered information pinned the trouble to the spoiler control system. This was corrected at Fontana and the second flight was gratifyingly successful. No major discrepancies were noted, and the craft remained aloft 11 minutes and 15 seconds.

And so today, with the first phase of the Gorgon IV flight testing nearing a satisfactory conclusion, the Navy looks forward to the full realization of the program's primary objectives — use of the ram-jet power plant operationally.

THE GORGON IV IS LAUNCHED AT A FLIGHT SPEED OF MACH .5 AT WHICH SPEED THE RAM-JET HAS SUFFICIENT THRUST TO ACCELERATE MISSILE

AND THERE I WAS...

Confidence

ONE OF NANEWS' writers, an F6F fighter pilot with half a dozen Japs to his credit, went back to sea duty the other day after two years of flying around in SNJ's.

He was assigned to fly F4U's in a *Coral Sea* squadron. On his first visit back to the office where he had been a chairborne admiral, he extolled the virtues of the *Corsair*: "Fine airplane . . . easy to fly . . . fast as hell!"

After delivering this sermon of praise, he opined he had better shove back to Norfolk, adding: "I wanta get back before the crash truck secures."

(Ed. Note: Did you make it, Willis?)

Cry "Wolf"

LIFE GOT pretty dull for communications officers attached to certain remote air stations in the Pacific. Planes buzzed in and out all day; pilots had tall tales to tell of their de-Japping operations. But the communicators just sat and sweated it out, doing the same tasks day after day. So they developed their particular techniques to vary monotony.

The first time a weary officer taking over the midnight watch decoded a dispatch and found it ordered him to proceed immediately for cushy stateside duty, there was great noise and rejoicing. He soon discovered that his predecessor had originated the idea, carefully coding it to give it that nice touch of authenticity.

The trick became standard practice and was good for a little excitement once or twice a week. Then everybody got wised up.

So when Lt. (jg) Joe Doakes in the course of decoding dispatches left on his desk by the previous W. O. came across a message ordering him to 90 days duty in Australia and thence to proceed to the states for flight training, he promptly tore up the message and burned it carefully.

Sixty days later the Commanding Officer received a sharp dispatch asking indignantly why one J. Doakes, Lt. (jg) had failed to report to his new station. The C. O. fumed, an investigation was made, the questionable habits of communicators discovered. The dressing down was general and in specific terms.

And J. Doakes, Lt. (jg) with 60 days unnecessary and unwanted duty behind him started on his way with a black mark on his fitness report for negligence in performance of his duties.

The Hairy Hand

Out on Guam, NATS Squadron Six has worked out something to take the worry wrinkles off the brows of its passengers when they take a first look at their plane flying "no hands"—on automatic pilot.

By taking a glove and fastening it to the windshield defroster, it was found the blast was sufficient to keep the glove filled out. Then by means of a few braces and a little tape a very realistic hand was made.

This hand, coming right out of the instrument panel, was made to clutch the yoke. To all intents and purposes, the hand very efficiently flies the plane.

It is claimed by pilots that inquisitive passengers can visualize the action of the auto pilot this way better than by other methods. Some reports state that the passengers got a glazed look and after a worried glance at the pilot, hastily went aft mumbling to themselves.

Look, No Brains!

How not to impress your check pilot with your knowledge of instrument flight technique recently was illustrated by one of VR-8's more brilliant junior birdmen.

While on a flight check for a "Smoke and Haze Ticket" with Lt. R. Stewart, this budding instrument pilot drove squarely over the high cone and didn't bat an eyelash.

Time passed and finally Lt. Stewart turned to him and said: "You passed right over the station; didn't you recognize it?"

The young man's face assumed a blank expression and he blurted, "Why, I didn't hear a thing!"

Low Bridge

ENSIGN Jack B. Hanks, on one of his first missions as a NATS ferry pilot, found himself making decisions in a hurry recently. On the first leg of a transcontinental flight from San Diego, while over the jagged Laguna mountains, he discovered to his consternation that the propeller governor had gone haywire and he had a "runaway" prop on his hands.

Corrective measures were of no avail. He decided that even though he had a chance to keep the plane airborne, the prospect of rough terrain ahead swayed his decision to choose an emergency landing field while he still had partial flight control.

Picking the best appearing terrain in the vicinity, he set the SNJ down between rocks, ruts and holes without any damage.

Hanks still believes there might have been a guiding hand, for after completing the emergency landing, he gazed back to see the high tension wires under which he had unconsciously made his landing approach.

R. H. I. P.

A FLAG officer tells this one on himself. When he checked in at Moffett Field for a flight east on the NATS *Hotshot*, he yawned deliciously in anticipation of a luxurious night's slumber in the plane's one bunk while the rest of the passengers had to sit up.

Luckily for him, his senior, another Rear Admiral, had cancelled his plans to return on the same flight. Time marched on. He could hardly wait to get aboard. About 10 minutes before the flight closed, his senior fellow traveller hurried into the terminal announcing his plans had been changed. Our friend sighed wistfully. That took care of the bunk.

A few minutes later, a Vice Admiral appeared, and the bunk changed hands again. Shortly thereafter, a General marched in and the Navy had to relinquish its nocturnal luxury to the Army. Everyone sighed again and ambled out in resigned fashion to board the flight.

At that moment, with a rush and a hush, Fleet Admiral Halsey climbed out of his car, walked aboard the aircraft, and settled down for the night . . . that's right . . . in the bunk.

Embarrassing Moments

Mrs. Cooke, wife of Admiral Cooke, ComNavWesPac, arrived in Guam en route to Tsingtao, China, to join her husband. She walked up to the NATSAsia space control office 30 minutes prior to scheduled departure time. She was traveling on dispatch orders, and her check-in with Space Control was more or less verbal.

"May I have your orders so they can be endorsed," the Space Control clerk asked her.

"But I have no orders, I am traveling on verbal orders," was her reply.

The clerk told her "That doesn't matter, I have to endorse those orders too."

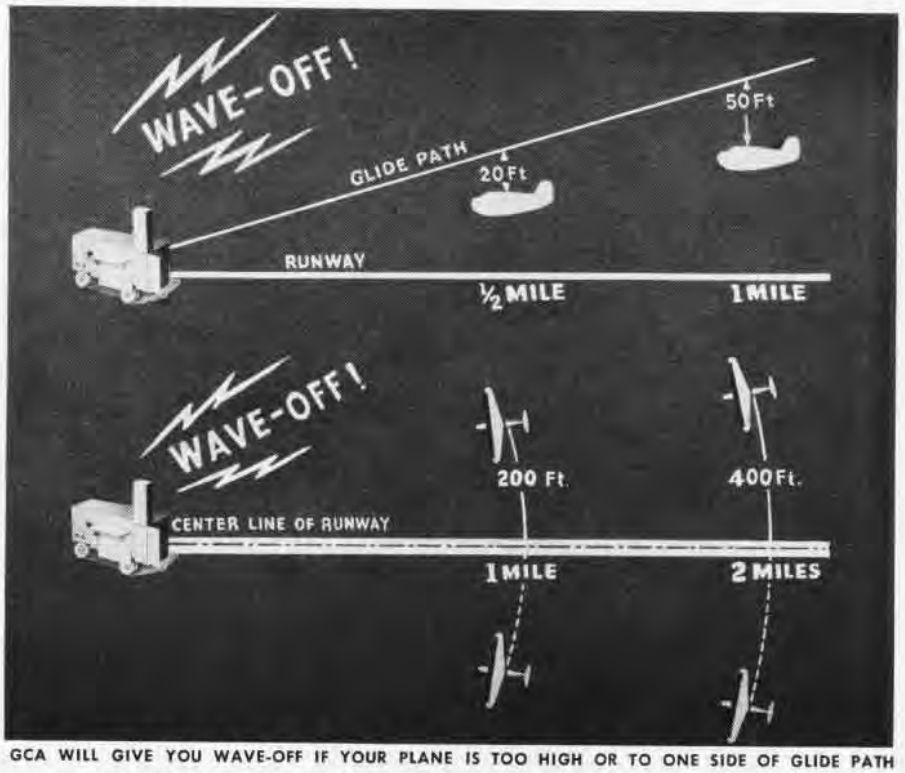
NAS MEMPHIS—This station has begun an insignia contest with $25 offered as first prize. The contest is open to all hands.—*The Bluejacket*.

NAS DALLAS—One of our riding horses has been put out to pasture. He was old and getting crochety, so in the interest of economy and safety, he was retired. (Ed. Note: But brave indeed—what with the present shortage of gasoline—a weaker man might have been tempted to keep old *Dobbin* hitched up.)

VR-4, MOFFETT FIELD—NATS has asked that a VHF repeater station be installed atop 4,000-foot Mt. Diablo, which would give them 150-mile radio communication with Moffett, from Red Bluff to Newhall and seaward. This station would give static free communication, eliminating interference and dead spots.

NATS LANT—You get some odd cargoes in NATS these days. One day 200 pounds of frozen Penguins were flown from Patuxent to Willow Grove and a few days later the Hotshot carried $3,000,000 worth of narcotics from Moffett to Washington.

GCA WAVE-OFF



GCA WILL GIVE YOU WAVE-OFF IF YOUR PLANE IS TOO HIGH OR TO ONE SIDE OF GLIDE PATH

OPERATIONAL instructions for use of the Navy's ground controlled approach units, including rules for giving wave-offs on bad approaches, are included in *Aviation Circular Letter 75-47*, issued by CNO.

GCA is no longer news in the Navy, having been in use at naval air stations the past year and a half, but its value in bringing in planes during fog or bad flying weather is becoming increasingly apparent. Units now are located at 33 different stations around the world.

Pilots in single engine planes as well as multi-engine aircraft are being checked out in dummy GCA approaches to give them the "feel" and confidence.

During GCA flights under instrument conditions and GCA flight check-outs, the following rules apply:

1. A wave-off shall be ordered if the aircraft falls 20 feet or more below the glide path at half a mile from the runway, 50 feet or more below the path one mile out and 75 feet two miles out.

2. A wave-off shall be ordered if it strays more than 200 feet to the right or left of the runway centerline one mile out from the field or 400 feet on either side at 2 mile range.

3. A wave-off shall be ordered anytime the aircraft's position is in doubt on either the elevation or azimuth scopes, or the operator suspects malfunctioning of the GCA equipment.

4. The pilot can take a wave-off at his own discretion at any time or when he fails to receive instructions during a continued period of five seconds.

5. The pilot shall now fly "under the hood" prior to approval of each specific approach by the GCA controller.

6. A wave-off order by the GCA controller is *mandatory*.

When a pilot is making a GCA flight check-out in a single pilot aircraft, a "chase pilot" must be flying alongside to warn him if he gets in a bad attitude. The pilot takes over visually at not less than 500 feet above the approach terrain, although the GCA controller can talk him right down to the ground if traffic permits.

If he is checking out in a dual control plane, one pilot can fly "under the hood" but the other must have constant visual contact and take over control anytime safety is in doubt. The pilot takes over at 50 feet.

THE CIRCULAR letter states that GCA units using station power must have diesel-generator sets running at idle speed during all operations under instrument conditions in case station power fails.

General policies for the units were outlined, including one specifying that GCA units on air reserve activities are provided logistic support by that activity. GCA unit crewmen cannot be assigned collateral duties which will interfere with their proficiency as a team. Shore duty survey reports sent to CNO must specify whether an individual so reported is attached to a GCA unit.

The Navy maintains GCA units at the following air stations: Whidby Island, Shanghai, Kodiak, Agana, Los Alamitos, Quonset Point, Moffett Field, Tsingtao, Miramar, Seattle, Olathe, Norfolk, New York, Argentia, Corpus Christi, Jacksonville (Lee field), Saufley field, Oakland, Atlantic City, Squantum, Barber's Point, Columbus, Atlanta, Glenview, Minneapolis, Memphis, Grosse Ile, Guantanamo, El Toro, Cherry Point, Willow Grove, Coco Solo.

STUCK ABOVE A CLOUD COVER? GCA IS SAVING PLANES EVERY DAY BY BRINGING THESE MEN IN

PLANES, SUB GANG UP ON FREIGHTER

When the Navy acquired a disabled freighter, the *Schuyler Colfax*, at Pearl Harbor recently, it took full advantage of it to give realistic war training to pilots of four squadrons and a submarine. The old ship really did triple duty because fire-fighters went aboard her at Honolulu, set fires and practiced extinguishing them before she went to sea for her last voyage.

Operation White was held while the

FIRE CREWS GO ABOARD COLFAX OFF HONOLULU

ship was three miles off Honolulu. It was to determine whether a small, well-trained group of fire fighters could reach and extinguish fires in hard-to-reach places in the ship.

The Navy spent four days loading the ship with combustibles. In spite of all the handicaps, the blaze was controlled in two hours. Two fire fighting units were used in the drill—one seaborne, and one airborne in planes of VP-MS-3.

The latter had 4200 pounds of special equipment loaded on a *Mariner* in 13 minutes. From Kaneohe, the men and gear were flown to Keehi Lagoon on the other side of the island. The flight took 21 minutes. There everything was loaded into a Navy tug and transported to the freighter.

The squadron reported, however, that men and equipment could have been landed right at the ship by plane, cutting by hours the time required for surface transportation. Three days later, two *Mariners* carrying 100-lb. bombs participated in an aerial attack on the Colfax, one securing a direct hit amidships.

Other attacking squadrons were VP-ML-6 and VP-HL-13. Four of the former squadron's PV-2's loaded with HVAR rockets and GP 100-pound bombs made strafing and bombing runs on the ship. Four planes from VP-HL-13 bombed the ship at masthead level and VCN-1 planes strafed and rocketed it for good measure before it was turned over to the undersea branch for its "licks." The USS *Tilefish* made two direct torpedo hits on it and finished it off for good.

COLFAX GOES TO BOTTOM AFTER AIR BOMBINGS

CVG-1 Now Gets 'Web Feet'

NAS Seattle Is Latest Training Stop

Attack Carrier Air Group One, now attached to the *Tarawa*, recently exchanged its San Diego sandals for a set of Seattle web feet. According to CVG-1 reports the soupy weather in that area has been more than made up for by the warm welcome extended by NAS Seattle.

The Seattle interlude is the latest phase of the intensive training program which CVG-1 has undertaken since reforming last May with Cdr. F. E. Bakutis as skipper.

During September carrier qualification was held aboard the *Tarawa*. A total of 1057 carrier landings were made for an average of 11 per pilot. Training included simulated strikes, anti-submarine patrols, search and rescue, sector rendezvous and break-ups. To Ens. R. D. Olsen went the honor of chalking up the 13,000th landing to be made aboard the "Terrible T."

Having traded in their F4U "bent-wing beauties," the "Red Rippers" of VF-1-A and the fighter pilots of VF-2-A made their simulated attacks in F8F-1B *Bearcats*, while the pilots of VA-1-A and VA-2-A performed their operations in SB2C's and TBM's respectively.

Because Seattle's fall weather is not "ideal," flight ground school takes up when fog closes in. Great stress is placed on icing, instrument flying and GCA. All pilots qualified in GCA approaches here and Whidby Island.

CVG-1 BEARCAT IS COAXED ONTO THE CATAPULT

'Women' Disrupt Asia Flying

Passengers Report Rough Travel

VR-6, Asia—Pilots of this squadron have been having trouble with women. The women, in this case, however, have been typhoons.

First one to hit the area was *Typhoon Olive*. From the very first, dog-legging around the typhoon was a necessity. While still concerned with *Olive*, *Pauline* came roaring across the Pacific as if the weather gods had gone on a spree.

The third typhoon, *Rosalind*, tore northward, ripped Iwo Jima and raised general havoc with Tokyo flights. Just as the sky was beginning to clear, *Typhoon Alice* was discovered in excellent position to hit Guam. For 48 hours *Alice* sat still and finally started to move well clear of our home.

Passenger reaction forms showed no unsatisfactory reports concerning the flying around the edges of these typhoons. But the pilots report there was considerable passenger reaction—with the orderly running back and forth frantically passing out cups.

Drone Evades Marine Guns

Long Distance Target Practice Flown

UtWing, Pacific — Drone *Hellcats* can be flown considerable distances and furnish antiaircraft target practice where smaller drones are not available, Utility Squadron 9 Detachment Baker, demonstrated recently at Saipan.

To provide a realistic target for a Marine heavy AA battalion, an F6F-3K target drone was taken off from Isley field and flown 180 miles to Pagan island. Simulated bombing runs were made on the island amid heavy AA fire for one hour and 10 minutes before returning to Isley.

Total flight time under radio control was four hours and distance to and from base was 360 miles, a fact which precluded use of a TD2C-1 drone.

The drone was taken off and landed from a field control truck by V. R. Sampair, APIC. Lt. Cdr. J. H. Moore, in charge of *Detachment Baker*, flew the drone to Pagan. He previously had controlled an identical drone at the Bikini atom bomb tests. The other control plane was an SNB-3 piloted by Lt. W. R. Hahn and the drone control pilot was C. E. Russ, CHRELE.

NAS Tillamook—Third and last "L"-type blimp erected in the hangar here for Douglas Leigh Sky Advertising Corp., after purchase from WAA, left for Moffett Field with Lt. Cdr. Romeo Simonelli (inactive) as pilot. The blimp was fitted with animated electric signs and commence a new career as a medium of advertising.

ASTRIDE HIS SCOOTER THIS VC(N)-2 SAFETY OFFICER CHECKS 'BOUNCE OPERATIONS' AS PART OF THE PROGRAM TO PREVENT PLANE ACCIDENTS

NEW VC(N)-2 PLAN CUTS DOWN PLANE ACCIDENTS

THE WANDS were jerked into a glowing "X." Rubber bit into the taxiway, followed by a sound not unlike that of a stick dragged across a picket fence. Jagged hunks of metal knifed through the air, as the pilot, straining to see the taxi signals in the dark night, drove his fighter into a line tractor, thoughtlessly left on the taxiway without lights.

It was too low to be seen in front of the black horizon and too small to reflect any meager light. Now another much needed plane would be on the shelf for an indefinite period of time. Many man hours best put to use on routine maintenance, already crippled by a lack of trained men, would be lost.

Night Composite Squadron Two, based at NAS BOCA CHICA, decided that a more positive safety program would have to be inaugurated.

NIGHT RUNWAY WATCH GIVES PLANE WAVE-OFF

First step was to assign a day and a night safety officer to maintain proper surveillance on and about the line. It is this officer's duty to inspect, before and during all operations, the taxiways, runways, necessary obstacles, and parking areas for proper lighting and to see that any hazards are removed; to call a halt to any violation of taxi discipline on the part of pilots or directors; and to be on the look-out for any unsafe practices by engineering crews in the hangar or on the line. He is furnished with a scooter to simplify his task.

Because pilots seem to suffer at times from erratic functionings of the "noggin" that compel them to make wheels-up landings, the squadron also established a runway watch. A radioman stands by the runway portable radio. An ordnanceman, armed to the teeth with the latest thing in pyrotechnics, is ready to send a star across the bow of an offender. An officer pokes an Aldis lamp at the belly of each approaching plane. An approach to the field at a low altitude is sure to start the fireworks, if it is felt that a wave-off could not be given effectively in case of a wheels-up pass.

The air control officer, of course, plays the most important role in the safety program. In his airconditioned headquarters, he keeps a running log on the whereabouts at all times of all squadron aircraft.

No pilot may leave the pattern after sunset without first contacting "air control." He can recall any plane within radio range to the base without leaving his chair. (A stand-by rescue plane and pilot are always on hand in case of emergency.) The other safety officers are responsible to the air control officer.

Since the inauguration of this program, VC(N)-2 accidents have dropped off to an amazing degree. More than 7000 safe night and day hours have been flown. Inasmuch as the majority of officers in this squadron have several "tours" of safety duty each week, everyone has developed a keener comprehension about what should be done to avoid becoming a long-eared member of Grampaw Pettibone's gallery of rogues.

DAY SAFETY OFFICER CHECKS LINE OPERATIONS

UTRONS

SOMETHING TO SHOOT AT

THE TOWED TARGET SLEEVE TYPIFIES THE VALUABLE WORK DONE DURING THE WAR AND AFTER BY UTILITY SQUADRONS IN TRAINING FLEET GUNNERS

UTILITY SQUADRONS have been an important adjunct of the Fleet since the early days of naval aviation. But as they are small in size and few in number, their work is not well advertised, and frequently is misunderstood.

The mission of a Utility Squadron is to provide aircraft services for the Fleet, most flights being towing and tracking jobs. On these hops the pilots rendezvous, test communications, and conduct the scheduled event as prescribed in the Training Exercise Manual for utility squadron operations.

DESPITE WATCHFUL EYES SOME DRONES HAVE MADE AS MANY AS 14 HOPS

The exercises are designed to teach radar, director, and gun crews the capabilities of their weapons under various types of attack. Generally, after a tracking event, a firing exercise is conducted with the pilot towing a sleeve in the same manner as the tracking hop was flown.

About 16 different type antiaircraft firing exercises have been standardized for ships. They vary from simple tows at constant altitude to more difficult runs, such as two planes towing in formation and making diving attacks from 7000 feet on the ships.

Other services provided are air-to-air gunnery tows for carrier based aircraft, CIC exercises to train fighter director officers, radar countermeasures hops to present "window" to radar displays, and other specialized flights such as calibration for radar, photographic cover for surface firing, torpedo chases for destroyers and submarines, communication drills with surface forces, and, at the conclusion of a training phase, a battle problem. A new addition to the Utron's repertoire is the release of the Mk 16 glider. This radio-controlled target is dropped from medium altitude and then controlled by a qualified aviator on the ship, as it simulates a *Kamikaze* attack.

UTILITY SQUADRONS also provide drone aircraft for the Fleet, either TD2C's (*Red Dogs*) or F6F-K drones. For a squadron to be prepared for such availability—called NOLO (NO pilot, thus NOLO instead of SOLO)—a minimum of 10 to 15 hours running time on the equipment is

required with a pilot aboard in case of materiel failure.

After being controlled both from the air by Primary and Secondary control planes and from the ground by *Fox* control, the drone is ready for NOLO hop. Upon rendezvousing, the drone is brought across the firing ship at the prescribed altitude and speed. If the ship has not shot the plane down in eight runs, the drone is returned to base and another hash mark is placed upon its red side.

Recently all TDD units have been incorporated in VU squadrons. TDD's are small radio-controlled model airplanes used in training 20 mm and 40 mm crews. They can be operated from ships or shore, with a naval aviator on the remote control "stick."

With World War II, a greatly expanded surface Navy needed additional antiaircraft training, and Utility Squadrons were enlarged to keep ships in top performance. One typical squadron, VJ-4, became so large it was divided into three units: VJ-4, VJ-15, and VJ-16. Wherever the Fleet operated, a Utron detachment provided the necessary services.

In the Atlantic, services were provided from Argentia, Newfoundland, to Recife, Brazil, and from Houston to Port Lautey, Africa. Pacific services ranged from Kodiak to Espiritu Santo and from the Pacific Coast to the Philippines.

A typical wartime squadron operated approximately 45 aircraft. Practically every Navy plane has been flown by the Utility boys. Today the squadrons operate TBM's, SB2C's, SNB's, PBY's, JD's, F7F's, and drones. Future plans call for a Utility version of the AD.

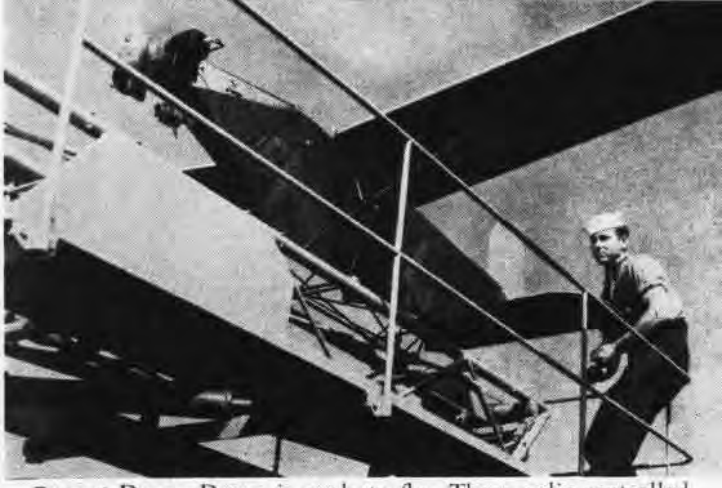
In 1947, with the increased number of jet planes in the Navy, the traditional designation "VJ" was changed to "VU."

Under reduced appropriations, Utility Squadrons have felt the economy axe also. Only three squadrons remain in the

FOX CONTROL AND TD2C DRONE; PILOT 'RIDES' ON PRELIMINARY TESTS

Atlantic Fleet, and three in the Pacific. About 15 aircraft are assigned to a squadron today, with approximately 30 naval aviators and 220 men to operate them. Contrary to pre-war rosters, the majority of the pilots are officers; the general policy is to assign aviators on their second tour of sea duty to these billets. Since UtRons are Fleet activities, all personnel are on sea duty, one reason for the popularity of these squadrons. After experience in Utility work, especially drone operation, officers have excellent qualifications for the pilotless aircraft field or for the guided missile program.

Utility Squadrons provide valuable training for operators of all antiaircraft equipment. Training ashore in the theory of radar and fire control is necessary. The real test of a crew's ability, however, comes with the appearance of a yellow-winged, red-tailed Utility plane, an actual target.



Target Denny Drone is ready to fly. These radio-controlled model airplanes have been incorporated in Utility Squadrons

CIC plotters keep tab on the location of Utron aircraft as they make tracking flights to train fighter director officers

Catapult launches a TDD for gunnery work-out. Drones require a naval aviator to operate the remote control "stick"

PACIFIC RESCUE

NAVY *Harpoons* and *Privateers* spent 10 days and many thousands of gallons of gasoline searching for four minesweepers adrift near Palmyra Island in the middle of the Pacific ocean. They finally were sighted and three men aboard rescued.

The minesweepers were en route to Manila in tow of the S. S. *Edward Grimm,* which developed engine trouble and ran low on fuel, finally being forced to abandon its tow and put back to Palmyra. A crew of three was put aboard one of the sweeps and they were about 160 miles northeast of the island when cast adrift. When the *Grimm* returned several days later she could not find her tow.

Patrol Squadron 13 was assigned tactical command of the search. More and more airplanes joined in until by the time they were found there were nine *Privateers* from VP-ML-13, four *Harpoons* of VP-ML-6, four *Mariners* from VP-MS-3 and -7 and four B-17's from the USAF.

Let VP-MS-6 describe how the search was made:

It was just an ordinary Sunday afternoon at Kaneohe naval air station October 5 when the phone jangled in the squadron officer's desk. Less than an hour after the call, four *Harpoon* crews were rounded up and had taken off for the search. They set out for Johnston island, the first leg of the flight to Palmyra atoll. Some five hours later and 700 miles farther, the PV's sighted tiny Johnston Island, barely visible in the last rays of the setting sun.

The next morning the four circled Johnston and set out for Palmyra, some 750 miles over the horizon. The Navy maintains a small fleet installation at Palmyra and the CAA keeps a few key personnel to man the control tower. In addition, Pan American Airways had a few repair workers on the lonely atoll, but otherwise it is a deserted pile of coral and sand nearly a thousand miles from Oahu.

Sleep and rest were in order for the 24 ML-6 men when they chocked the planes for the night at Palmyra, but the plane captains came back after chow for another whirl at stubborn gas valves, leaky hydraulic lines, and small discrepancies. It took more than a little ingenuity to rig some lights for the dusty, unused quarters assigned for sleeping, too. DDT was only a name to those "skeeters" who really grew big and buzz-bombed all night in deadly fashion. The B-17 and PB4Y-2 crews were situated in the same quarters, but they had arrived beforehand and were well settled.

Bright and early the next morning, Cdr. Ira Brown, commanding the search from Palmyra, under direct orders from ComHawSeaFron, assigned the PV-2's search sectors on the NE side of the island, out some 450 miles, a short lap across, and then back to the Palmyra base, completing a slim, wedge-shaped search sector.

The gas problem became acute on the third day, each PV burning nearly 1100 gallons a search, and the PB4Y-2's sucking it into their 2300-gallon tanks regularly. The CAA supply became exhausted and a tanker was diverted to Palmyra from Oahu, but some technicians unraveled the secret of making the huge supply of stored avgas usable so the search continued unabated.

New parts had to be flown down to replace worn out radio and radar gear, but the repairs were made speedily and out the planes went again. After a week's absence, two more PV's were dispatched to relieve two crews who were then to return to Kaneohe via Johnston.

It was ACRM Wayne Nash of ML-6 who picked up the missing ships on his radio and got the first accurate radio bearing. When the *Privateer* crew of Lt. Jack Becker finally located the minesweepers by the weak radio signals, our PV's were out searching in adjacent sectors near the scene of the discovery. It was a good deal of relief to all concerned that the missing seamen were found in good health.

This squadron used 10,845 gallons of 100/130 gasoline and 289 gallons of oil during the search and flew 13,100 over-water miles. This would run a passenger car seven and a half times around the world at the equator. VP-ML-13 reported it flew 409 hours and burned 85,000 gallons of gasoline in its searches.

MCAS EL TORO—VMF-223 has adopted a new ground training syllabus. Recent officer graduates of the Amphibious Warfare School, junior course, will teach.

MAG-24, PACIFIC—Since Marine Ground Control Intercept Squadron Seven's last report, its location has been changed from South Field, Peiping, China to NAS OROTE, Guam.

NAS MEMPHIS—An off-duty hour Spanish class is being conducted for 22 officers and men by Lt. Carlos Martinez of the Uruguayan Navy. The Lt. is completing a course in maintenance at NATTC.—*The Bluejacket.*

MACG TWO, EL TORO—The Air Support section furnished air support parties equipped with radio jeeps in a simulated close air problem with MAG 31 at Camp Pendleton. A familiarization syllabus has been prepared by Air Control Squadron Two to train local pilots in close air support.

Getting *a heavy Navy jet plane to the top of 6,300-foot Mt. Washington in New Hampshire so studies could be made of wing and engine icing was not a standard operation. So NAS Quonset had to rig scaffolding and devise methods of pulling and pushing the Phantom up the winding mountain road. These photographs taken by the Providence Sunday Journal show the FH-1 on the way up, with one truck, ballasted by heavy stones, pushing the trailer and one pulling it. Note how wings and rudder had to be removed so it would pass through highway bridges and narrow road clearances. The second photo shows the Phantom after the long pull to the top. To the left is the open-ended shack that will house the aircraft while scientists from Aeronautical Engine Laboratory, NAMC, Philadelphia, and the Wold-Chamberlin Co., Minneapolis make winter studies. It sounds like a cold job for anyone to take up voluntarily.*

DID YOU KNOW?

Navy to Buy 100 Jet F9F's

Grumman Fighter is 'Pilot's Plane'

The latest in the Navy's "jet parade" —the Grumman XF9F-2—has been revealed, with the information that Navy was procuring 100 of the carrier-based, single-engined fighters. (*See photo, pg. 3*)

The newest of the famous Grumman line of Navy fighters is as yet unnamed. It is in the 600-mph. class and is powered by the Rolls Royce *Nene* engine or the J-33 (I-40). The first two models have the British jet engine and the third the J-33. Subsequent models will be evenly divided between the two engines, which will be interchangeable in the plane.

The XF9F-2 has the typical Grumman square wing tips and air scoops in both wing roots like the FH-1 *Phantom* and the F6U *Pirate*. A new feature will be a movable leading edge which can drop down much like the landing flaps on the trailing edge. This "droop snoot" gives improved stalling characteristics and lift on take-offs and landings.

The cockpit is considered to be a close approach to a pilot's ideal for simplicity and compactness and was based on medical studies. A highly-desirable feature is the short take-off run, which permits it to operate fully loaded off a carrier without being catapulted.

Maintenance is expected to be easy. A flip of a lever allows the whole nose section to be removed. The tail section can be detached in less than a minute. Production versions will have pilot-ejection seats for use in emergencies.

Exhibit Honors Air Admiral

Mitscher's Mementoes at Annapolis

One of Naval Aviation's outstanding heroes, the late Admiral Marc A. Mitscher, is honored by a special exhibition of historic mementoes at the Naval Academy Museum at Annapolis.

Beneath a portrait of Admiral Mitscher lie such well-known things as the Admiral's famous baseball cap, his four-star flag which was flying at the time of his death, his medals and citations and various personal articles.

Also in the exhibition is a chart of the Japanese islands and China coast signed by each of the Doolittle flyers who took off from Admiral Mitscher's carrier, the USS *Hornet*, for the first Tokyo raid. Included with this is a memorandum from Fleet Admiral Ernest J. King to Mitscher in connection with the raid.

MRS. MITSCHER, CAPT. BALDRIDGE AT EXHIBIT

A model of the NC-4, first plane to make the trans-Atlantic flight with Lt. Cdr. Mitscher at the controls in 1919, stands beside models of modern-day naval aircraft which flew with Admiral Mitscher's famous Task Force 58.

Men who served under the admiral during the war attended the opening exercises at the exhibition, as shown in the accompanying photograph.

Rush Job Saves Tot's Life

Hellcat Pilot Flies Gear to Norfolk

When the life of a four-months-old baby hangs in the balance, speed records sometimes fall. It fell to the lot of Lt. Terry P. Cassidy, stationed at NAS ANACOSTIA, to set some kind of a relay record on Nov. 14 when the life of Lynn West hung in the balance at Portsmouth, Va., Naval Hospital.

Special medical equipment to save the infant's life was located at Johns Hopkins hospital in Baltimore. Cassidy took an F6F off at Anacostia 10 minutes after receiving the call for help. Eight minutes later he landed in Baltimore, picked up a special tube from a nurse and took off immediately.

Within 37 minutes he was at Norfolk where his plane was met by an ambulance which took the equipment to a waiting boat to cross the Elizabeth River for the hospital. The total rescue mission consumed only 60 minutes.

Marines Get Aboard Carrier

Waste No Time Downing Wheels

MCAS CHERRY POINT—*Corsairs* of VMF-225, operating off the USS *Siboney* (CVE-112) in Cuban waters, set what may be near record breaking intervals for operation off of escort carriers.

These intervals were set while under supervision of the training command at NOB GUANTANAMO BAY. The intervals were: Thirteen-second fly-away, 25-second catapult and 22-second landing interval.

The closest landing interval between two aircraft was 15 seconds. These intervals were established with eight or more aircraft.

'Hydro' Charts Up To Date

Navy Fliers Require Accurate Maps

An Australian aerial navigator wrote that a reef was shown in the wrong position on the U. S. Navy aeronautical plotting chart. A report from Egypt stated that the elevation of a peak in North Africa was incorrectly shown on the charts.

These letters and many like them aid the Hydrographic Office to keep correct the information shown in aeronautical charts and publications. The office keeps a file of worldwide information on aeronautical facilities, aids and hazards to air navigation. It assisted in planning the route of the Navy's *Truculent Turtle* in its world record breaking distance flight in 1946.

The products of the office for naval aviation are listed in the *Catalog of Aeronautical Charts and Publications on Issue by the Hydrographic office*, dated 1 July 1947. This catalog also lists the main such items produced by the Air Force and Department of Commerce which are believed to be needed by naval aviation and can be ordered through the Hydrographic Office.

The office orders ICAO publications from Montreal whenever CNO determines they are needed by naval aviation in order to conform to the international civil aviation procedures.

Among the newer products of the office are charts and tables covering all existing Loran installations, and publications showing all operating racons and sector homing YG beacons.

The two most important sources of air navigation information for the Hydrographic Office are *1.* accurate and prompt reports from stations regarding changes in their facilities and *2.* reports of errors or suggested changes made by users of the charts and publications. All navigators and station operations personnel please keep in mind to "keep the Hydro office informed."

'SMOKE' STREAN RELATES HIGH HATTER EXPLOITS OVER SHIP BULLHORN

STEADINESS IN FACE OF DISASTER BROUGHT MORNER BACK TO SHIP

FIGHTING ONE

FIGHTING Squadron ONE first met the enemy at Tarawa in 1943. There the "High Hatters"—this was the nickname of their squadron—flew their *Hellcats* from carriers into the fray with the skill they had been taught.

Behind them were the training days, the commissioning at Alameda 1 May 1943, the final carrier qualification tests, and the long trip across the Pacific to meet their baptism by fire. This was it. And they did not muff their chance to get at the Japanese. Supporting the vital troop operations, they steadily attacked for four days enemy personnel, anti-aircraft emplacements and all ground installations. This was accomplished with no loss to the 44 planes of the squadron.

After the conquest of Tarawa, *VF-1* was charged with the defense of that strategic milestone on the road to Tokyo. For this purpose they were land-based at Betio which was ill-equipped for the purposes it must serve. The airstrip was in such bad condition that only the high operational caliber of the squadron can account for the fact that all 44 planes landed safely. Of the next six planes coming in from other squadrons, five had accidents.

Life was rugged. Revetments served as barracks for the first two nights, and subsistence for the first week was that unappetizing bill of fare known as K rations. At the end of two months 50 percent of the personnel were grounded with dengue or dysentery.

The commanding officer whose leadership and fighting spirit led his squadron victoriously during Tarawa and later operations, often against greater numerical strength, was Cdr. B. M. Strean, USN, known as *Smoke*. As island air defense commander, he directed the work of the squadron in making sorties in addition to daily dawn-to-dusk combat air patrols.

After the duty at Tarawa, *VF-1* had a second training period at Oahu from 5 February to 29 May 1944. The emphasis on nightfighting paid off tremendous dividends 19 June when the squadron landed all its planes aboard the Yorktown after dark after its strike against the Japanese Fleet.

Aboard the Yorktown from 29 May to 2 August, *VF-1* lived breath-taking, battle-marked days, forty of which it spent in contact with the enemy. They were part of the force that spelled out the coming doom of the Japanese in the Mariana, Bonin and Caroline Islands. The handwriting on the wall was as nothing to the handwriting in the skies. For the eleven men lost in combat in this period, *VF-1* made the enemy pay.

And this was the bill! 101 enemy planes and 19 probables, all airborne; 61 planes on the ground, eight ships damaged and 16 sunk, 26 AA batteries silenced, and 7 fuel or ammunition dumps blown up. In the *Turkey Shoot* alone, *VF-1* downed 37 Jap planes and six probables and, for good measure, scored two bomb hits on a *Hayataka* class carrier.

On three of *VF-1*, Vice Admiral Marc A. Mitscher pinned the Navy Cross: Cdr. Strean, Lt. Richard T. Eastmond, USNR, and Lt. (jg) John R. Meharg, USNR. Two others, Lt. Robert R. Baysinger, USNR, and Lt. (jg) George W. Staehli, USNR, received the Air Medal with two Gold Stars; four, the Air Medal with one Gold Star; and fourteen, the Air Medal.

Fearless and versatile, *VF-1* had, in the first 15 months after its commissioning, proved its mettle. Land-based or carrier-based (CV or CVE), it had done night fighting, day fighting, bombing and escort work for a total of 29,210 hours and made 3,898 sorties in combat zones.

WHAT OF the men and the deeds behind the statistics? Cdr. *Smoke* Strean attracted AA like a magnet. He it was that delivered blistering criticism of pilots who flew too low. The pilots could only listen with respect and amazement, for after all, *Smoke* himself always flew the lowest. And it was none other than *Smoke* who claimed that anyone who jumped from a burning plane before his shirt tail was on fire was just an accident looking for a place to happen. Fate gave him the chance to test his doctrine when AA hit his wing root and the gas tank seemed to be on fire. *Smoke* stuck to his plane over the enemy island, and providence was kind, the blaze thereupon went out!

Special persistence was the mark of Lt. (jg) William P. Tukey, true to his native New England in his thoroughness. Once his flight was working over a Japanese convoy and everyone was eager to be in on the kill. On his run, Tuke's bomb failed to release, so

MOVABLE SEAPLANE SLIP

MARINER ENTERS SLIP; NOTE HOW WATER JET FORCES PLANE TO CENTER

THREE WATER JET NOZZLES VISIBLE WHEN SLIP RIDES HIGH IN WATER

THE TICKLISH job of mooring a seaplane under rough water, wind or tide conditions will be simplified by a movable seaplane slip developed by Bureau of Yards and Docks at Port Hueneme, Calif.

Use of the slip eliminates need to maneuver the plane ashore or secure it to an elusive mooring buoy and makes mooring and unloading of a seaplane as simple as that of a small ship.

Mooring of the plane is simplified by the bell-mouthed slip, half-inflated LTA tires as guards and six water jets, three on each side of the mouth to push the plane from one side or the other.

The slip operates on a 600-foot wire cable secured at one end to a dock and the other to a buoy. It can move along this cable to any spot along its length and pivot in any direction to permit the entering plane to taxi against the wind.

The Civil Engineer Corps used its highly-versatile pontoons to build this floating structure. It contains 134 of them in three levels and can be lowered or raised in the water similarly to a floating drydock. When being towed, it rides high (*see photo below*), but while in operation it has only 18″ of freeboard.

Because the bottom level of pontoons is at right angles to the operating deck, the slip when being towed appears to be moving sideways. Total length of the slip from port to starboard end is 125′ and width between outsides of the bow and stern pontoons is 52′. Clear width of the channel is 17′.

The slip has three propulsion units to permit self-maneuvering, all of them modified Sea Mule units. Two are at end of the stern side and a third at port bow end. This unit pivots the slip while the other two pull it along the cable.

THE SLIP is submerged to its operating depth or raised by a system of pipes into the pontoons. The first tier can be flooded, but the second remains watertight to give buoyancy to the slip. The top tier is flooded and emptied by pumping water in or out of each pontoon.

On each side of the channel side of the operating deck is a row of LTA tires, set 37″ apart, to prevent the plane from hitting the metal pontoons. Tires carry 10 lbs. pressure.

A further aid in steering the plane directly into the slip is the six water jets. These are powered by a Chrysler fire-fighter pump, gas driven, with 500 gpm. capacity. The jets themselves are fire nozzles which reduce from 2½″ to 1″ and can be operated singly or in groups. Entrance to the slip is skeleton construction to permit easy access to the jets.

Tests show the slip can be modified. At present, for example, it can take a larger plane than a PBM. Width might be decreased where smaller planes were to be accommodated.

Other suggestions which undoubtedly will be incorporated in future models of the slip are a common power unit for propulsion and pump operation, installation of a radio to coordinate action between the slip and seaplane, and a more efficient trolley action in the fairlead to insure a full 360° approach area for the plane without a mooring buoy.

At present, obstruction is possible if the offshore end of the slip is in less than 40′ of water. Also, a way must be found to reduce the drag of the cable when maneuvering the slip. Weight of this cable slows up the speed.

ON THE other hand, the slip was successful on many counts. Jet action, it was found, definitely controlled approach of the plane so that even the worst kind of an approach could be overcome and a good entry made. Jets were most effective when used alternately and individually for driving the plane away from one side or the other.

Most important, the plane was maneuvered into the slip quickly and simply, and without danger of damage to plane or slip. The pilot of the seaplane used in the tests at Hueneme declared "it was much easier to enter the slip than to secure to a mooring buoy."

Pilots of *Mariners* and *Catalinas*, who have spent many minutes maneuvering around so their crewman could catch a mooring buoy, will welcome such an improvement in beaching technique. With a cross wind or tide to contend with, bringing the big seaplanes in often proves a time-consuming job.

FLARED ENTRANCE TO SLIP WITH TIRE GUARDS

VMR-153, CHINA—This squadron helped carry Nazi repatriates and German sympathizers from Tientsin, Tsingtao and Canton to Shanghai. Nine planes brought 159 Germans and their baggage from Tientsin, three plane loads with 43 persons were carried from Tsingtao and one brought 10 persons from Canton. The squadron has been giving weekly DDT sprayings to the Marine air base and Tsingtao.

VRF-2—Business is good with this ferry squadron. In one month recently, its pilots delivered 290 planes, flying 3,876 hours and covering 607,824 miles in their travels.

TECHNICALLY SPEAKING

DEVICE WITH MAP ENCLOSED WORKS LIKE THIS

New Map Holder Aids Pilot

No longer will a pilot have to scrabble about for his map, when he needs it for quick reference. The Special Devices Center has recently developed a map holder which enables him to hold a cross country aeronautical map in a convenient reading position on his left leg above the knee. More important this device is so constructed that the pilot may trace his flight course readily with a minimum of distraction from his other duties.

This map holder, as may be seen in the pictures, resembles a notebook cover. The back is made of aluminum and has straps by which it may be attached firmly to the pilot's leg. Also on the back cover may be found a Mk 8 computer, which may be swung up on a movable arm when the device is in use.

The front of the holder is made of transparent plastic; a small portion in the upper left hand corner is frosted over to allow for pencil notations. Attached to the front cover by a plastic arm is a movable compass rose with a detachable chain. The holder measures 11" x 7½".

After the desired aeronautical map is inserted in the holder, you operate the device in this fashion to obtain the true course: *1.* Position center of movable compass rose over departure point or aircraft position overground. *2.* Rotate compass rose so that 0° parallels the longitudinal lines on the map. *3.* With the chain around knob at compass rose center, extend tip of chain along course line to destination or check point. *4.* From compass rose read the true course.

By picking up the length of chain from the compass rose to the destination tip and laying it along the mileage scale at the top or bottom of the map, you may then read the mileage.

Time, speed and distance information can next be readily worked out from the Mk 8 computer, extended from the top of the holder.

Finally you may enter a pencil notation on ground speed, E. T. A., etc., on the frosted section of the plastic cover.

This device, identified as 12-BW-1, is available for distribution to training and operational commands. Requests should be addressed to the Director, Office of Naval Research, Special Devices Center, Sands Point, Port Washington, Long Island, New York.

Mark 2 Buoys Being Tested

NAS JACKSONVILLE—At the request of Airborne Equipment Division of BUAER, the Aviation Training Department at this station is commencing a six-month test of the Mk 2, crash marker buoy, on CV-type aircraft. About 125 of these buoys have been installed on F4U's, F6F's, TBM's and SB2C's. Results of the test will be submitted to BUAER for study and for possible equipping of all CV type training aircraft with them.

The Mk 2, buoy is cylindrical in shape and is engineered to cause minimum drag. It measures approximately 3" in diameter and is 27" long. Weight of the buoy, ready for service, is 3 lbs.

MARK II BUOY INSTALLED ON PLANE FUSELAGE

The buoy is released from its carriage (attached to the aircraft) by a hydrostatic mechanism, which is actuated when the aircraft submerges and which requires no action on the part of the pilot. This actuation takes place between 5' and 15'. Upon release the buoy floats in a manner that closes an electrical circuit and causes a small lamp to remain lit for about 24 hours. In addition to this light, which is visible through 360°, the buoy contains a large fluorescien dye cake, which is dissipated in the water for an extended length of time.

The buoy is anchored to the aircraft by a 750-foot length of nylon line, which is self-contained on a reel within it. The location of the buoy, which is normally mounted on the upper portion of the fuselage between the cockpit canopy and the dorsal fin, just off the center line of the aircraft, allows a controlled water landing without harm to the buoy itself.

The tests at NAS JACKSONVILLE are designed to check the effect these buoys will have on the flight characteristics of the type aircraft and to determine the best locations to install them for a minimum of undesirable characteristics and a maximum of efficiency in case of a water landing.

Drum Gathers Worn Out Oil

MCAS CHERRY POINT—Standard procedure for AirFMFLant units based here is to collect reclaimable aviation engine oil in several 55-gallon drums at an oil collection point in each squadron area.

DRUMS WELDED TOGETHER GIVE CAPACITY

To combat spillage both at the aircraft and at the oil collection area, a portable collector tank was developed here of two 55-gallon drums, bottoms removed and welded end to end. Rain water collects on top of ordinary drums and floats the oil off onto the mat. In addition, there is a tendency among mechs to put contaminating liquids and solids into these drums as an easy means of disposal.

The portable tank is mounted on a Mk 2 bomb trailer and secured with a bomb holding chain. Drain and filling arrangements in the ends are designed to keep out rain water and make it impossible to put foreign matter in the drums.

One man can easily move the cart and it is low enough to be pushed under any engine. A hose arrangement is coupled directly to the oil drain outlet fitting to get the used engine oil.

▲ ***BuAer Comment*—The method shown is an economical and satisfactory way to handle reclaimable aviation oil without contamination. Some stations have attached a power-driven pump to a similar arrangement.**

'Canned' Planes Go to Work

NAS TILLAMOOK—This station is utilizing all available personnel and facilities to meet a quota of 35 planes a week withdrawn from the storage pool and ferried away.

Deterioration is about equal to that found in active service type aircraft. Assembly line procedure has been set up and proved highly satisfactory and beneficial.

Fast PB4Y-2 Engine Change

VP-HL-13 maintenance had a good workout recently when the search and rescue plane at Midway Island lost an engine about one hour out of Midway. An engine was sent down on the weekly NATS run, arriving just before dark on Friday afternoon.

The engine was turned up and run in on Sunday, and the plane departed for Kaneohe at sunrise on Monday. All work was performed during daylight hours since the crew was unable to set up the one jury rig.

GREAT GUNS!

In its November edition, NANEWS *carried an article about an Air Force P-51 pilot who used some ingenious mathematics to claim a 90% record of hits on an aerial tow sleeve. Since his sleeve was 50% smaller than a Navy "bothot's!" who had scored 87% hits, he had multiplied his hits by 50%.*

The article brought the following communication from J. M. Moore and J. T. Gibbs of VF-10-A *at* NAAS CHARLESTOWN, R.I.:

"It was very interesting to read of the brilliant gunnery record compiled by Capt. Edward F. Kelly III of the USAF. We are pleased to write that a member of our squadron, Ens. Hiram McSchmaltz, has recently bettered Capt. Kelly's record by 3.6%, shooting a masterful 93.6% in aerial fixed gunnery.

"Ens. McSchmaltz was flying an F8F loaded with 113 rounds of .50 cal. ammo. This odd figure was standard when the guns were loaded by Harry Scrantz, S2C, recently with our ordnance department but now mess cooking. The target used was a somewhat tattered A-6A sleeve, figured to be only 17/21 of the size used by Kelly because of its battered condition and several moth holes.

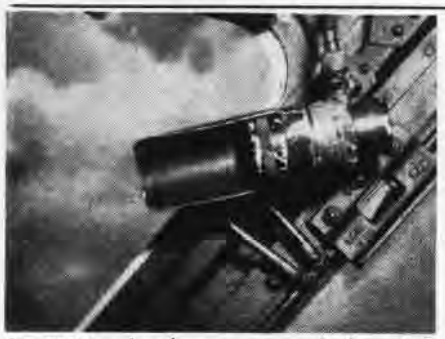
"A few minor handicaps confronted our ace, which we shall mention. The target was towed at 500 ft. at a speed of 390 mph, and McSchmaltz was required to make overhead runs. The speed was just triple that of Kelly's tow, a factor used in 'adjusting' McSchmaltz's hits. On the first run Mac had to pull 11 G's while executing the pullout, which exceeded the safety factor of the F8F, resulting in the loss of the left wing tip.

"Undaunted, he carried on the hop. S2C Scrantz, the former ordnance striker, had loaded two guns, both on the port side, an influencing item when the average was computed.

"The sleeve was returned to the field, and 11 hits were counted, which included two in the tow plane. Thus computing the 'weighted' record, we very fairly added 81% for the size of the sleeve, 110% for altitude of the target, 300% for the speed of the target, 283% for lack of wingtip, 171% for incorrect loading of the guns, total 945%.

"Simple multiplication of 11 hits by 945% gives 104 out of 113 rounds fired, for a colossal 93.6%. We are pardonably proud of Ens. McSchmaltz, and know you will be too."

(Editor's Note: Yup.)



Visibility *in the* PV-2 *aircraft for night flying has been improved by placing a shield on the side fluorescent lights. The shields keep the glare from the lights off the windshield,* NAS WHITING FIELD *reports. Developed by Lt. Cdr. Horn*

New Fuel Causes Tank Leak

VMF-115, PACIFIC—A reduction in flying hours was necessitated by trouble this squadron had with leakage caused by use of the new 115/145 grade aviation fuel.

A shrinkage of seals in the fuel booster pump, selector valve and at the dump valve caused leaks at these points. All planes were grounded for 10 days while booster pumps were overhauled and replacement seals were obtained.

▲ ***BuAer Comment*—The shrinkage of the seals and other rubber components of the fuel system is caused by a reduction in the aromatic content of postwar gasoline. Wartime production of aviation gasolines contained a high percentage of aromatics.**

These aromatics caused rubber components of the fuel system to swell. The postwar gasolines, because of economic considerations, generally have a lower aromatic content. This reduction in both the 100/130 and 115/145 grade gasolines allowed the rubber components to shrink and caused the fuel leakage.

BuAer has a program underway to develop a rubber-sealing material that will be suitable for use with both high and low aromatic fuels. Replacement seals would be required in numerous instances, whereas a retorque of most fittings, particularly fuel cells and fuel cell fittings, would prevent most leaks during this interim of investigation by BuAer.

BOOKS

History of U. S. Naval Operations, World War II; Vol. I. *The Battle of the Atlantic, 1939-1943.* Samuel Eliot Morison, Capt., USNR. Little, Brown, 1947. $6.00. (Vol. 1 is the second to be published in Capt. Morison's projected 14 volume history.)

Japanese Naval and Merchant Shipping Losses During World War II by All Causes. Joint Army-Navy Assessment Committee. Superintendent of Documents, U. S. Government Printing Office. 1947. 75c.

The Japanese at Leyte Gulf: The Sho Operation. James A. Field, Jr. Princeton Univ. Press. 1947. $2.50. (Study based on Japanese sources.)

Safe for Solo: What Every Young Aviator Should Know. Rear Adm. Frederick M. Reeder, USN (ret.) and Robert C. Osborne. Harper. 1947. $4.50. (Illustrated by the creator of "Dilbert")

MAGAZINE ARTICLES

The Airfreight Situation. Earl F. Slick. *Aero Digest*, Nov. 1947, pp. 28, 29, 111-113.

Rocket Engine Development. Roy Healy. *Aero Digest*, Nov. 1947, pp. 38-41, 116, 119, 120, illus.

Convention Report. *Air Force*, Nov. 1947, pp. 8-31, 48, illus. Complete coverage of 1st annual AFA convention.

The McDonnell *Phantom*. Kendall Perkins. *Air Trails*, Oct. 1947, pp. 22, 23, 115-119, illus.

Helicopter School. *Air Trails*, Oct. 1947, pp. 32-35, 126, illus. Helicopter Air Transport, Inc. established first school to train rotary wing pilots.

Testing the Thunderjet. Carl Bellinger. *Air Trails*, Oct. 1947, pp. 36-38, 107, 108, illus. The test pilot's report.

All-Weather Flying Center Develops New Operational Aids. Robert Hotz. *Aviation Week*, Oct. 27, 1947, pp. 11, 12. Progress report on Air Force experiments at Wilmington, Ohio.

Douglas *Skystreak* Hits 680 mph. *Aviation Week*, Nov. 3, 1947, p. 17.

Sandwich Structures for Aircraft. Robert McLarren, Irving Stone. *Aviation Week*, Nov. 3, 1947, pp. 28, 29, 31, 32, illus.

Hughes Answers Senate Probe with First Flying Boat. Scholer Bangs. *Aviation Week*, Nov. 10, 1947, pp. 11, 12, illus.

F-12 Based on Fighter Experience. Robert McLarren. *Aviation Week*, Nov. 10, 1947, pp. 28-30, illus. Republic's photo-reconnaissance plane.

Douglas Unveils Its New Research Plane. Robert McLarren. *Aviation Week*, Nov. 17, pp. 12, 13, illus. Data on the D-558-2 *Skyrocket*.

Concentration on Jet Research Expected to Yield Greater Gains. *Aviation Week*, Nov. 17, pp. 29, 30, 34.

Altitude Blow-Out of Jet Engines Under Widespread Investigation. Robert McLarren. *Aviation Week*, Nov. 24, 1947, pp. 22, 23.

Is G. I. Training Good for Aviation. Phillips J. Peck; William Welsh. *Flying*, Dec. 1947, pp. 30, 31, 88-92.

I Hold the World's Speed Record. Major Marion E. Carl, USMC. *Flying*, Dec. 1947, pp. 32-34, 99, 100, illus.

The Supersonic Urge. Sgt. Vernon A. Langille. *Leatherneck*, Oct. 1947, pp. 20-25, illus. Various aspects of jet propulsion discussed.

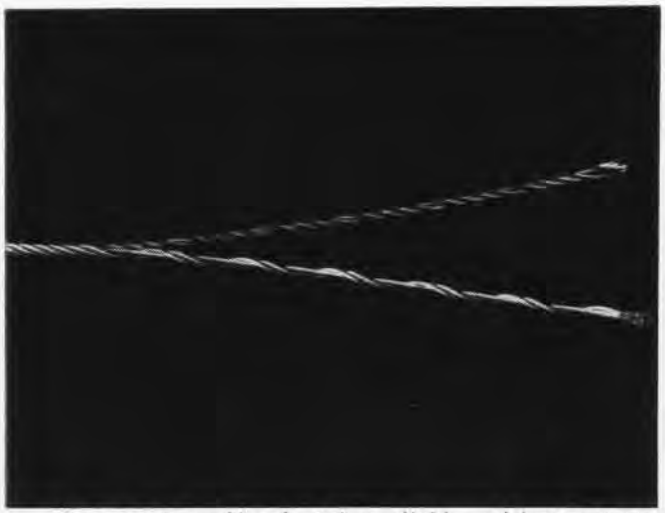
Our Navy Explores Antarctica. Rear Adm. Richard E. Byrd, USN (ret.) *National Geographic*, Oct. 1947, pp. 429-522, illus.

The Man Who Can Make It Rain. Steven M. Spencer. *Saturday Evening Post*, Oct. 25, 1947, pp. 24, 25, 189, 190, illus. The story behind "Project Cirrus."

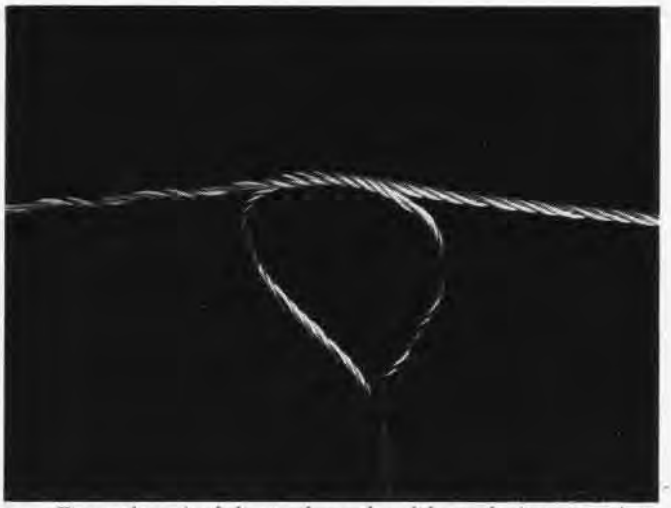
Don't Underestimate the Difficulties of Guided Missiles Problems. Part II. Dr. Lawrence R. Hafstad. *U. S. Air Services*, Oct. 1947, pp. 25-27, 32.

First Year of the Line School. Cdr. James C. Shaw, USN. *U. S. Naval Institute Proceedings*, Nov. 1947, pp. 1341-1345. Objectives, organization, operation of the Naval School (General Line).

VR-2—This squadron, which uses the *Mars* seaplanes, has received the long-promised PBM. All pilots are checking out in the *Mariner* which is to be used as a training ship in seaplane handling, seamanship, radio range problems, and general water-work.



1 *First step in making loop is to divide end in two parts, one with three and one four strands, 18-24 inches long*



2 *Form three-inch loop of overhand knot, laying strands to fit into preformed lay of cable, forming smooth joining*

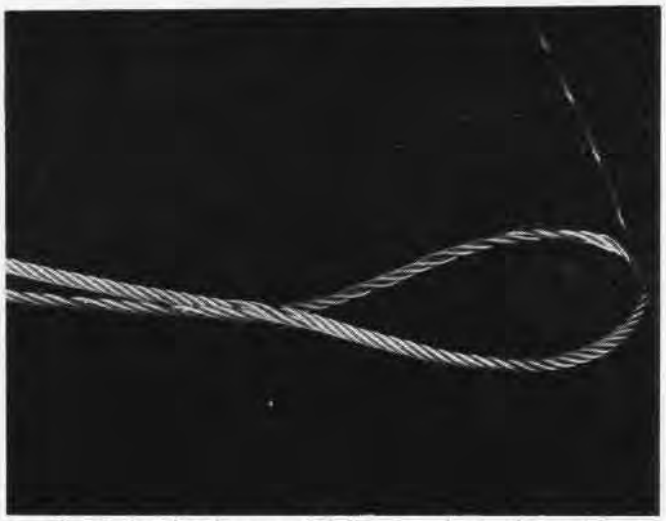
TOW CABLE LOOP STRONGER, SAVES TIME

THE NAVY has been tying knots in wire rope for quite a few years, but Utility Squadron Seven has come up with a new, stronger way to form a quick-eye-splice in the end of a wire rope tow cable. It takes only 30 seconds to do and will take more than three times the strain.

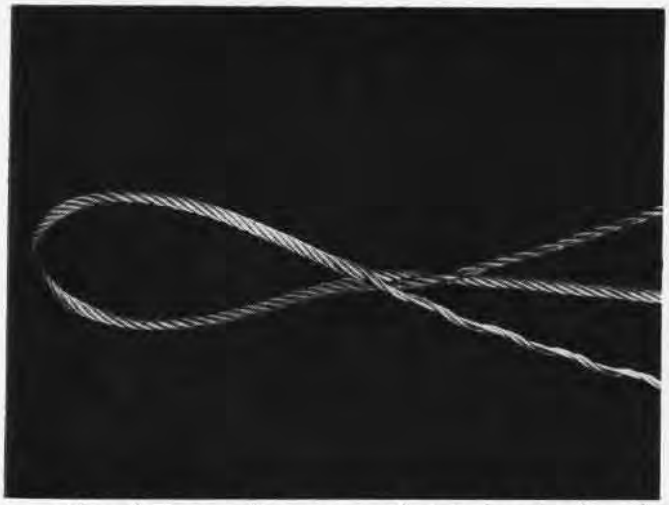
The idea was developed specifically for attaching a nose ring of an aerial sleeve tow target directly to the end of a tow cable. But it can be applied almost anyplace in the Navy. Recommendation has been made that it be included in the *Bluejacket's Manual* and boatswain's mate training course.

Heretofore a bowline knot was put in the end of the wire rope. This would take about 800 pounds stress. A quick-eye-splice with a six-inch diameter and two-inch "pig-tail" will take 1900 pounds, tests at A&R department at Pearl Harbor indicated. UtWing 7's cable was 1/8" preformed flexible 7x19 wire, but it is believed usable for larger sizes as well.

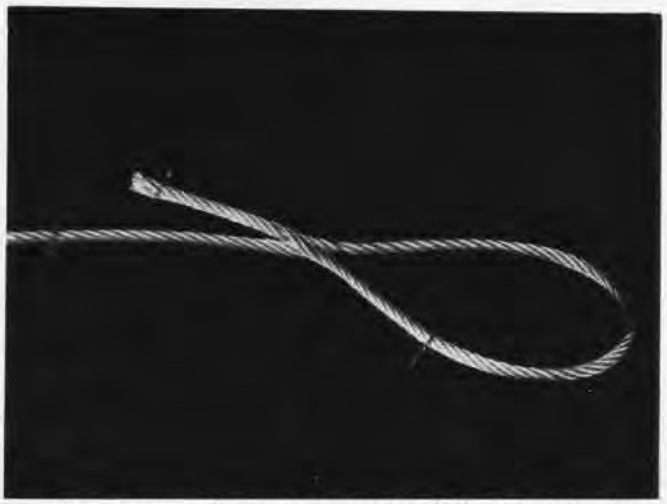
By using this type of splice, the squadron was able to attach tow targets directly to the cable without using a shackle, tow target leader and/or snarl catcher. The idea not only gives a stronger join but saves considerable time.



3 *Rewind either loose end following the preformed lay of the cable to complete one side of the quick-eye-splice*



4 *After the two ends are rewound around each other, the two loose ends are brought together and pulled tight*



5 *Two loose ends are laid together following join, forming the pigtail and using up all the loose end of cable*

R5C Used For Photo Plane

MAB, TSINGTAO—During the landing maneuvers of the Third Amphibious Group and the Fleet Marine Force, Western Pacific, a request was made for vertical and oblique photographs of the proposed landing beaches.

An inspection of the available planes revealed that the only suitable plane in the command, that could readily be set up for vertical photography was the R5C. It was found that by removing the bottom fuselage hatch, an internal installation of the F-56 8½-inch camera could be made. The only work required was the boring of two holes in each of two longitudinal stringers on the fore and aft sides of the hatch inside the fuselage. This enabled the securing of two horizontal braces that support either the NR-1 or NR-2 camera mount. These holes ⅛ inch in diameter were made as small as possible

A CLOSEUP OF THE INSTALLATION USED IN R5C

to prevent any weakening of the stringers. For power, a line was run from the electric suit heater outlet and the intervalometer installed on the port window ledge in the cockpit.

By removing one section of the wire screen between the heater compartment and the hydraulic accessory compartment, a man can crawl down to the camera while in flight. This has been done on all flights made with this installation, because with the NR-1 mount the photographer can, by intercom, keep the pilot advised on the flight lines thereby insuring complete coverage of any area.

From the results obtained, it is concluded the R5C is a very good photo plane, in that it is stable and has enabled the flying of quite accurate flight lines.

Bearing Clearance Checked

NAS JACKSONVILLE—A faster and more accurate method of checking clearance between the front impeller shaft bearing and bearing plate on R-1830-92 engines was developed by an inspector here under the Navy Beneficial Suggestion Program.

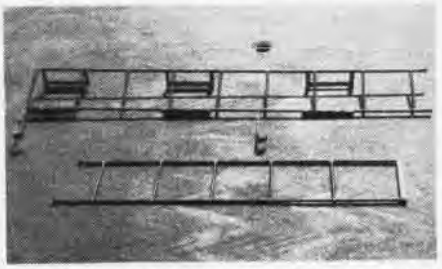
With use of a surface plate and dial indicator attached to a surface plane, the surface plane dial indicator is set on the liner noting the reading, then placed on the surface plate. Thus difference in readings is the clearance of the front impeller shaft bearing and front of liner. Dial indicator is then used to determine dimension of retainer plate step. With these two dimensions, the amount of grinding required on the retainer plate step is determined for the required clearance between the bearing and retainer plate step.

(Developed by H. O. Scurrey)

HOW TO LOAD ROCKETS WAY UP THERE ON AD-1

Aid to AD-1 Rocket Loading

When AD-1 wings are in the folded position, the Mk 9 Mod 2 aircraft rocket launchers, mounted under each AD-1 outboard wing panel, are hard to reach. To facilitate loading under these conditions, the ordnance department of Attack Squadron Nineteen Able,



LADDER IS MADE FROM WELDED STEEL TUBING

NAS ALAMEDA, has developed a compact, light-weight ladder which can be fabricated locally.

The ladder is made from welded steel tubing with suitable locating hooks and supporting brackets. When the ladder is installed, access to the rocket launchers is greatly simplified. *(See photos.)*

▲ *BuAer Comment*—The AD is considered a first line combat plane and anything that would facilitate loading should be considered; however, a number of ladders would be required aboard ship.

This ladder is satisfactory for SCAR rockets, but 5″ rockets (weight about 138 lbs.) need two men for handling.

The F4U-SB2C rocket loading stand, R89-S-800160, (on Sect. "G" Allowance List for Carriers) is suitable for the two inboard rocket stations on the AD and AM, but not for reaching the outboard stations. Two men can stand on this equipment, so 5″ rockets could be handled.

Tool Aids Spring Installing

NAS ALAMEDA—The previously hazardous procedure of installing springs on aero selector valves is now done with complete safety, in addition to a saving of time, by use of a special spring installing fixture.

The fixture consists of a tube and plunger. The inside diameter of the tube is the same as the outlet of the valve where the springs, spider, and lock ring are installed. This tube serves as a guide for these parts and the plunger. The plunger is slightly smaller than the tube and is fitted with a handle.

In using this tool, the tube fitted with guide pins is placed over opening in valve body and the valve, springs, spider, and lock ring, in their proper order, are placed in the tube. The plunger is inserted and pressed downward. This compresses the springs, and the lock ring automatically drops into place.

▲ *BuAer Comment*—Very excellent idea. Maintenance activities can use more of these handy tools. NAS Alameda drawing —Assembly Fixture: Installing Aero Selector Valve, sketched 6/5/47—should be consulted for specifications.

PILOT-NAVIGATORS FIND THE DIVIDERS HANDY

Pencils For Pilot's Dividers

Submitted by a squadron commander at Instrument Flight Instructors' School is a useful idea for a pair of dividers, an indispensable item in every navigator's kit list. When the pilot is his own navigator, a set of "pencil dividers" *(see photo)* is a convenience, for it does away with the hazard of personal injury from the sharp points of regular dividers and with the difficulty of making a pencil mark on the pinpoint of the chart.

The device is exceedingly simple, consisting of two metal pencil holders joined so as to pivot on each other. A fibre lock nut and washer between holders is used so that tension can be adjusted sufficiently and held. The "pencil dividers" have been tried and found most practicable.

Navy Acquires Plane Plant

The Navy has acquired title to the largest of three Curtiss-Wright plants at Columbus, Ohio, from the Reconstruction Finance Corporation.

A law passed by the last Congress permitted the Navy to take title to the property to preserve its status as one of the five stand-by facilities throughout the nation available for military aircraft production in the event of a national emergency.

Plant #3 is the largest of three plants. The other two are held by War Assets Administration. Formal transfer of the title was made on 1 December and the Navy will negotiate a new lease with Curtiss-Wright, which will continue to operate in the plant. The old lease expires 31 December.

ROCKET MOTOR MAY BE ANSWER TO 'MORE SPEED'

PRIOR TO the last war, the average American mind relegated rockets to the comic strips or to little-known societies—whose members always wore thick-lens glasses. Then one day V-1s and V-2s began falling on London. After that, the rocket gained considerable stature in a very short time.

Development of rockets in the U.S., however, has been slow in catching up with the German advances. As yet no U.S. rocket-powered missile compares with the V-2 in size or power. Martin Aircraft and Reaction Motors, under contract with the Navy, is now building what will be the first rocket vehicle comparable to the V-2—Navy *Neptune*—and it won't fly until 1948.

Emphasis has been placed, in this country, upon the development of rockets for powering guided missiles comparable in size to the V-1, and piloted aircraft. In that field we are at least abreast of German development, if not surpassing.

The BUAER program ". . . is aimed at infinite range at nearly unlimited speed. Properly developed, the rocket engine can bring this goal within our grasp, for despite its enormous appetite for fuel, it is the only known engine even theoretically capable of driving a vehicle in excess of 3000 mph." That's pretty far and pretty fast!

REACTION MOTOR CLOSEUP SHOWING UNITS

The German Walter 109/509 rocket motor used in the ME-163 fighter is comparable to our A6000C4, which is being used to power the Air Forces' XS-1. The specific propellant consumption figures are approximately the same. The A6000C4 was built by Reaction Motors under contract with BUAER and furnished to the Air Forces for their Bell research airplane. At the time the AF got their motor, no fuel pump had been developed. As a result a gas pressure system is being used in the XS-1 power plant, which forces propellants into the combustion chambers. This entails very heavy fuel tank construction so as to make them capable of withstanding the pressure required to force the fuel into the combustion chambers. Since that time, Reaction Motors has produced a workable fuel pump capable of giving the motor the required fuel pressure. This will cut some 90% from the weight of the propellant tanks, allowing more fuel.

FUEL PUMP IS DEVELOPED FOR NAVY ROCKETS

A6000C4 ROCKET MOTOR COMPLETE WITH PROPELLANT TANKS MOUNTED ON MOVABLE TEST STAND

The A6000C4 differs from the Walter 109/509 in several respects. The German motor weighed 360 pounds and had only one combustion chamber and one jet outlet. This single combustion unit developed over 3700 pounds of thrust, and power was partially controlled by reducing the fuel supply to the combustion chamber. However, this method of power control is very inefficient, for the combustion chamber and jet nozzles are the exact size for maximum efficiency with a precise amount of fuel input. Reduce the fuel input and the efficiency drops very rapidly as a result of the lowered jet pressure.

THE AMERICAN motor weighs about 330 pounds and has four combustion chambers, each with an individual jet nozzle. Each of the cylinders develops 1500 pounds of thrust for a total of 6000 pounds for the four units. Fuel input is kept constant to each combustion chamber, so as to maintain maximum efficiency, and power control is handled by cutting off one or more cylinders at a time. This method is not the most flexible known, but it is a very simple system of control.

SEAPLANE FIGHTER

SIDE VIEW SHOWS JET SEAPLANE'S TRIM LINES

RETRACTED WING FLOATS AND NOSE SCOOP

NAVY hull designers and jet aircraft experts are watching with interest development of the Saunders-Roe jet fighter flying-boat which has made numerous trial flights in England.

The plane, somewhat larger than land-based jet fighters, has a 46-foot wingspan, weighs about 15,000 pounds and is expected to be in the 500-mph class with installation of larger Metropolitan-Vickers *Beryl* engines.

Original jets developed only 3,300 pounds thrust, but later models delivered 3,850 lbs. Water performance of the plane appears to be good in view of the aerodynamic qualities of the design. The two jet engines receive their air from a common intake in the nose—the plane's outstanding feature.

Since the jet exhausts are slightly offset from the hull, no bad effects from the hot air were reported. Rough water tests have not been made as yet since the plane is not designed for open sea operations. Company engineers report spraying salt water into the intake of a Beryl on the bench, resulting in a slight reduction in performance and a deposit of salt on compressor blades. As a precaution, provision is made for an extendable intake to avoid sucking in salt spray while taxiing.

Two retractable pontoons are located on the wings. These draw up to the underside to provide better fairing in flight. The hull is 50 feet long and beam is 6.8 feet. Four 20 mm. guns fire from the nose, past hinged gun covers.

New Range Receiver Checks

VR-8—Recent pilot "squawks" of poor reception on the 190-550 kc range receiver in certain planes added many gray hairs to members of the radio maintenance gang before the trouble was located. After each "squawk" the gear was ground checked and in each case the radioman reported the reception as being O. K.

After several repeated "squawks" on the same aircraft, however, a comprehensive check was undertaken which resulted in the discovery that the antenna transformer in the input circuit on the antenna was shorted out. This gave the effect of having practically no antenna connected to the receiver, but, inasmuch as range stations nearby were used for checking the receiver during the ground checks, very little difference in reception could be noted.

It is believed that failure was caused by RF voltage being fed into the range receiver antenna circuit from the trailing wire antenna by direct contact during flight. No replacement transformers were available in the area, so an urgent dispatch was sent to ASO Philadelphia requesting replacements. The check crews also have corrected the error of only checking nearby stations by adding all ranges in the Hawaiian Islands to their check list.

▲ *BuAer Comment*—As a result of the above experience it is suggested that other organizations servicing aircraft, which use a separate coupling transformer between the antenna and the range receiver, keep a spare transformer on hand. If this transformer is incorporated in the bench set-up for range receivers it will permit checking each receiver tested for proper operation with the transformer and will serve as a reminder that the coupling transformer is a vital part of the receiving installation.

The automatic volume control, incorporated in most modern receivers, greatly decreases the value of reception checks carried out on local stations. When flight-testing or ground-checking a receiving installation, an attempt should always be made to receive signals from stations known to be at or near the extreme range for a good receiver.

Swaying Tanks Give Trouble

VMF-211, PACIFIC—This *Corsair* squadron has figured out ways to combat trouble with Mk 4 drop tanks, Mk 51 Mod 12 bomb racks and Mk 8 bomb shackles working loose during flights and landings.

Close inspection of these installations is mandatory after each hop. The "coat hanger" type sway brace and the pylon-tightening stud tend to work loose, causing several reactions.

Failure to keep sway brace chocks tight will cause the side plant tank suspension lug to ride up and cut, break, or jar off the lock ring or hook and link assembly fin. Set screws in the adapters for the Mk 51 bomb racks have been filed to a point, enabling them to fit into grooves cut into the arm of the sway braces. This keeps the sway brace from jarring loose on the adapter.

Another discrepancy noted was the manner in which the tanks swayed. It was found that the wrought steel plates, or sway brace chocks, exerted unequal pressure against the side of the tank, causing cracks in the weld of the tub in the adapter where the arm of the sway brace fits. To overcome this the adapter wings were welded into the side plates that fit onto the bomb rack itself.

Shackle yokes are inspected closely to insure that the nut and lock nut are tight. If they are not snug, the shackle will sway, causing the adapter to chip pieces out of the pylon check assembly. The pylon-tightening stud must be secure to avoid losing the entire pylon assembly. An extremely rough taxiway has caused the squadron considerable trouble with the *Chance Vought Service Change 158-8*.

▲ *BuAer Comment*—A modification to the F4U pylon has been tested satisfactorily. It comprises the Mk 8 shackle plus coat hanger sway braces and makes a rigid installation possible. Kits will be available late next year. MCR 158-8 consists of the Mk 51 bomb racks suspended to the Mk 8 shackle by an adapter and was installed on about 100 airplanes by ComAirPac as an interim fix. If the sway brace shank set screw tends to loosen, the difficulty may be alleviated by using longer set screws and lock nuts. Breakage of lock rings by the suspension lug may be overcome by replacing the old rings with Truarc rings which are narrower. TN 62-45 has been issued regarding installation of Truarc rings.

Marines Testing Fuel Tanks

VMR-152, EL TORO—This squadron is scheduled to receive an R5D-3 as a test airplane for fuel tank leakage. The tanks in one wing will be processed using the TCS-46 process.

Tanks in the other wing will be processed with the Proseal method. A six-month trial will then be made on the plane in normal service to see which process is more satisfactory. The aircraft is being prepared for the test at NAS ALAMEDA.

CFR Now VFR

ICAO (International Civil Aviation Organization) recently approved the changing of a term long familiar to American aviators. CFR (contact flight rules) are now VFR (visual flight rules). The change, approved by international agreement, was made because many countries did not have specific words meaning "contact," whereas all had words meaning "visual."

NATS—Fresh milk, used on cereals served with the light breakfast menu, recently replaced frozen milk on VR-8 and VR-2 flights departing Honolulu. This change was necessary due to a breakdown of milk components when the frozen milk was thawed.

A&R TRAINING PAYING DIVIDENDS

Corpus Christi Men Getting Actual Experience On Job in the Shops

AN AMBITIOUS on-the-job training program instituted by A&R vocational training officers is paying big dividends for NABTC CORPUS CHRISTI.

A mounting work load and a large decrease in the number of experienced personnel caused the Basic Training Command to set up the course early in 1946 in line with BUAER Integrated Aeronautics Program policies.

Military personnel assigned to A&R, mostly seamen, are enrolled immediately in the training program. Here they work on actual production while gaining knowledge which benefits both the student and the Navy.

The A&R Department at Corpus Christi is understandably proud of the work which is being done by these inexperienced men. Obviously, a beginner doing actual production work needs close supervision, and first class and chief petty officers are in every area in which a student works. These rated men are combination instructors and supervisors for their assigned students.

TROUBLE SHOOTERS WORK ON THE FLIGHT LINE

Courses have been established in six rates, so that each man will have a wide field from which to choose. These include training for aviation machinist's mates, metalsmiths, storekeepers, painters, electronics technicians and electronics mates. At present there are 350 seamen enrolled in the training program.

A typical example of the training being given is the AMM course. It is laid out on a one-year basis. The student spends four days per week in the shop and one day in the class room. Thus 85% of his time is devoted to normal production without robbing him of valuable training time.

An AMM trainee spends six weeks in each of six training areas essential to that rate plus 18 weeks in an engine school. Upon completion of the course, a trainee will have in his log book credit for six weeks in aircraft disassembly and engine preservation on R-1340, -1820 and -1830 engines. He will be well qualified in carburetion and ignition.

To be sure that his instruction is well-rounded, the trainee also gets six weeks of engine build-up and installation, subassembly of component aircraft parts, final assembly and rigging of control surfaces and three-week courses in brake and landing gear, cables and tie rods. Six weeks of operational training in the flight test division round out the course.

EACH OF the other courses is as thorough in preparing a man for his desired rate. For example, the AM trainees attend a 10-week school for aircraft welders which helps them to become full-fledged metalsmiths.

The SKV trainees spend three hours per week in typing class, six weeks in being checked out in the inventory of aircraft and keeping and closing out of log books. They are taught theory from the *Supply Afloat Manual* and learn short-cuts in expediting material. The PtrV course is designed to prepare the student to pass any painter's test after one year's instruction.

In addition to the courses offered for seamen, a 37-week Work Improvement program is now in progress for all chief and first class petty officers. This program includes a 30-hour course for which the men receive a Navy Department certificate.

Subjects include principles of management, related trade technical material, relationship with civilian workers, care of material and equipment. Twenty-eight hours are also devoted to relationship subjects such as factors of leadership and psychological control factors.

A similar program is in progress for the civilian foremen, quartermen and leadingmen in NATB. Classes are much the same as those for military personnel except that more emphasis is placed on the civil service rules and regulations in the handling of employees.

There are many veterans in the A&R Department. At present 72 of these men are taking training under the G. I. Bill which will lead to a rating in the aviation industry.

Trainees are enthusiastic in endorsing the program as well-planned and efficiently conducted. According to training officers at Corpus Christi, most graduates of the A&R program plan even further study in order to increase their chances for promotion in the Navy.

After thorough Corpus training AEM students can operate electronic gear

The carburetor will hold no mysteries for students who work on production

Small class assures close supervision and individual instruction for A&R trainee

Six weeks of building up, installing engines gives student valuable training

SERVICE Test
INTERIM REPORT DIGEST

This digest covers the 15 October and 15 November Interim Reports of Service Test, NATC PATUXENT, and does not necessarily reflect BUAER policy.

AM-1 (52 Hours)

Wing Walkway Painted metal cockpit access wing walkway becomes slippery when wet or coated with oil. *Recommend* that suitable non-skid walkway material be cemented to wings for access to cockpit.

Wing Folding Mechanism. The wing fold control mechanism consists of two levers, one controlling lock pins and other controlling cylinder hydraulic valve. Lock pin lever is inter-connected with hydraulic valve lever so that when hydraulic lever is placed in the spread position it is locked in this position until wings are spread and lock pins are home. This sequence eliminates the safety and desirable feature of being able to stop the wings at any point during a spreading operation. *Recommend* that contractor modify wing fold control mechanism to permit selection of the "fold" position during a wing spreading operation.

Wording of Handbook. The first sentence of par. 2-26(c) of pilot's handbook AN 01-35-EF1 is incorrectly worded in that it infers that the bank selection switch is used only to select the bank to be checked, and the main switch is used to check the spark plugs of each bank. *Recommend* that the sentence be corrected to read as follows: "To check each magneto, in the event of excessive drop during normal check, place the main switch on 'Both' and then place the selector switch opposite the various banks, pull and turn the selector switch to 'L' or 'R'."

Clamp Assembly. Marmen clamp assembly, P/N 21734-10 and 21734-12, continues to fail regardless of torque applied during installation. Failures of four clamps are believed due to misaligned exhaust stacks. Fourteen other clamps have failed on various parts of the exhaust system. The clamps are being tightened finger tight with one-half additional turn with a wrench and then cotter pinned. *Recommend* that contractor provide a serviceable clamp and comply with specification for exhaust systems, 81E1 (Aer) of 30 Sept. 1946.

Stabilizer Clamps. (Exhaust stack assembly bank No. 7, header cylinders 7-A and 7-C, P/N 51847-3 and header cylinders 7-B and 7-D, P/N 51847-2) The lug or spacer for attaching the after stabilizer clamp, P/N 21734-10 and 12 is welded to header assembly, P/N 51847-3 and does not fit contour of adjacent header assembly, P/N 51847-2, around which stabilizer clamp is secured. This misalignment is believed responsible for four clamp failures in this position. *Recommend* that contractor investigate and correct cause of misaligned lug or spacer.

Magnetic Compass. Compass, P/N R-88-C-777, installed in upper left corner of pilot's windshield, indicates 240-270° regardless of aircraft heading. *Recommend* that contractor use a non-magnetic material in the construction of windshield frame or install compass in dependable location.

Wiring Diagrams. (Electrical and electronic wiring diagrams, P/N 10-605-1004) Leads from the power source are not shown on all diagrams. Diagrams for specified equipment contain items and leads which are related to other equipment. For example, in figure 8-38, items 32 and 44 are diagrams of the APS-4 junction box and radar filters. Title of figure 8-38 is Radio Altimeter, AN (APN-1). *Recommend* that figures 8-38, 8-40 (sheet 2) and 8-41 (sheet 2) be redrawn in accordance with Spec. AN-W-14, par. C-106(1) to show only equipment indicated by title, with associated power leads; and that a new page be added to show complete connection of the alternating current junction box (item 40) as provided in drawing NO. R-857-C.

Gyro Installation. The air line installed between AN/ASG-10A gyro and Skinner air purifier, AN 5822-1, is joined to a straight connector, AN-816-08, at the air purifier, producing kink in hose five inches from purifier. *Recommend* that a 45° angle connector, AN 832-8, replace straight connector.

Exhaust Pipe Coupling. Coupling, P&W P/N 93258, installed in A-1 cylinder broke after 28 minutes of military power and 53 minutes of normal rated power. Total engine time was 63.8 hours.

Lubricator. P/N NAS2-101, installed in rear spar lock pin, could not be reached with standard grease gun fittings. Following fix was incorporated: A one inch diameter hole was drilled through the former located aft of left and right rear wing folding lock pins.

Power Brake Valve. Two power brake valves, Bendix P/N 145795, serial No. 6A1305, were found to be leaking after 28.1 hours operating time. Examination showed pressure inlet port cracked because of being drilled and tapped off center of boss. Both cracks were through thinner side of wall.

Trunnion Assembly. (R.H. P/N 10-2080126-2 and L. H. P/N 10-2080126-1) After 1490 rounds were fired the four 20 mm cannon trunnion assemblies were found cracked on the forward inboard side of the legs, approximately one inch below the trunnion bolt holes at the 1/16 inch radius. *Recommend* that contractor provide serviceable trunnion assemblies.

Pilot's Cockpit. Corrugations of upper wing structure which pass under cockpit flooring are not self-draining with airplane in the three point attitude. Hydraulic fluid leakage under cockpit flooring collects in corrugations. *Recommend* that contractor comply with par. 226 of SD-24-F.

Pilot's Data Compartment. Door to the pilot's data compartment is constructed of wooden strips glued to canvas. The wooden strips become detached from the canvas and pull out of the track. No catapult lock is provided for the door. Vibration opens the door, depositing loose articles in the cockpit.

Hydraulic Installation. Following hydraulic discrepancies occurred during interim:

The ninety degree fittings installed in flap selector valve for pressure and return lines were found to be leaking after 48.8 hours operating time. Flap selector valve had to be removed completely before the 90° fittings could be removed. Two defective AN 902-5 gaskets were replaced. To gain access to the flap selector valve it was necessary to remove the pilot's seat and inspection plate on fuselage skin adjacent to hydraulic console. Time required to replace two defective AN 902-5 gaskets is two men, eight hours.

The union on the pressure line to main relief valve was found to be leaking. Replacing AN-902-12 gasket in this union with an AN-6227-16 "O" ring seal corrected this leak. To gain access to main relief valve it was necessary to remove the right rudder heel plate. Time required to replace AN-902-12 gasket with AN-6227-16 "O" ring was three men, 12 hours.

Shuttle valve for port landing gear actuating cylinder was found leaking after 48.8 hours. Leak was corrected by replacing AN-902-8 gasket with an AN-6227-12 "O" ring seal. Time required was 1 man, 1 hour.

Access Door Needed. Access to the void between fuselage stations 192.5625 and 201.250 can be gained only by removing fuselage fuel tank removal door and one or both structural doors through station 201.250. *Recommend* that access door be provided to recover loose equipment that may be dropped into the void from the cockpit.

Starter. After 52.8 hours operating time the starter, Jack & Heintz, model JH4NPR, serial N-137, failed to energize. Examination showed starter terminal broken internally. *Recommend* that additional material be added to terminal to increase service life of starter.

Tail Wheel. After 32.9 hours operating time the Grizzly tail wheel, P/N 4-820, was found to have two broken tubular rivets, and all other rivets were deflected at their mid-length 3/16 of an inch toward the wheel axle.

Pitot Pressure Line. Hose assembly pitot pressure line, P/N AN 0270-4-30, was found fouled by outboard gun buffer after a wing folding operation. The following fix was made: Pitot pressure lines attached to outer wing panel were deflected two inches aft. This provides a five inch clearance at outboard gun buffer.

Armament Change. Aircraft armament change No. 21, consisting of modification of the latch link of the aircraft rocket launcher, was incorporated during interim.

Carburetor Air Scoop. (Metal assembly, P/N 10-5000047) Alternate air door of the

metal carburetor air scoop began to bind after 25.8 hours operating time. Examination showed that rubber air seal installed in door was being pulled out of its channel by contact with the three vertical spreaders in the alternate air door opening. The following repair was made: Door air seal riveted in place with twenty 1/8" x 3/8" countersunk rivets; vertical spreaders concaved 3/32" to provide clearance

AM-1 (95 Hours)

Exhaust Pipe Coupling. P&W P/N 95884 installed in cylinders A1 and C1 broke after 56.9 hours operating time and after a two-hour flight using 1800 rpm and 34.5" hg. *Recommend* that thrust stabilizer support be provided at exhaust stack tail pipes for this bank.

Exhaust Stack. After 59.9 hours operating time, exhaust stack, P/N 10-5000028, for cylinders A7 and C7 broke adjacent to weld attaching after stabilizer lug to this stack. *Recommend* that a thrust stabilizer support be provided at exhaust stack tail pipes of this bank and that exhaust system be designed and tested in accordance with BuAer spec. 81EI (Aer), 30 Sept. 1946.

Exhaust Stacks Reworked. P/N 10-5000211 to 10-5000216 inclusive reworked to Ryan Drawing C769 differs from the system removed as follows:

1. Slip joints at C and D rows have been replaced with mechanical clamp joint.
2. All stabilizer clamps removed.
3. "U" channel tail pipe clamps have been replaced with two-piece strap figure eight clamp.
4. A stabilizer thrust support is provided for the exhaust stack tail pipes of bank number one. During installation of this test exhaust system these defects were noted:

(a) Stabilizer exhaust thrust support arm was chafing against exhaust stack 10-5000211-AC for cylinders A1 and C1. Corrected by relocating forward attachment point of the thrust support arm.

(b) The figure eight clamp was 1/8 inch too wide for its position between the clamp retaining dimple and the weld attaching cockpit heat exchanger to number five bank. *Recommend* that all figure eight clamps be reduced from 1 inch in width to 7/8 inch for complete interchangeability.

(c) Clamp attaching forward leg of stabilizer thrust support to engine mount rod is too large. This clamp was shimmed with two pieces of .040 steel for installation. *Recommend* that contractor provide a clamp of proper size.

After 25.3 hours operating time, exhaust stack P/N 5000214A, latest revision stack, broke circumferentially at the weld to the flange for A4 cylinder. *Recommend* that exhaust thrust stabilizer supports similar to the one now installed for bank one be installed for bank four and bank seven. The clamp, P/N 21887-4, attaching stack 5000211C to stack 5000214A was broken at the weld. This break appeared to be a result of exhaust stack failure. Clamp and its bolts chafed through all adjacent exhaust stacks at "C" row. These clamps are temporarily being safety wired to prevent rotation.

Induction System Drain Line. After 90.1 hours operating time the left induction system drain line, P/N 10-5000076, was found broken. Induction drainage system consists of 3/4 inch tubing attached to left and right engine induction system drain sumps. These lines are approximately 12 inches long and terminate over funnels riveted into lower engine hood panel. Failure of left drain line is believed result of engine vibration and from damage inflicted during installation of lower engine hood panel. *Recommend* that induction system drain lines be rerouted from lower engine hood panel and be discharged overboard near station 107.000; also that drain lines be formed of continuous tubing or hose.

Access Door. Access provided through side accessory panels to engine oil tank sump and oil cooler flap actuator is not adequate for inspection and maintenance. Bottom and after side of sump cannot be seen and are at arm's length from side accessory panels, complicating replacement of gaskets and safety wiring of bolts. Oil cooler flap actuator is located below oil tank sump and cannot be reached from side panels. *Recommend* that a readily removable access door, approximately 21" x 17" be located in upper surface of after oil cooler duct. Door should center on oil cooler jack shaft, to improve accessibility for inspection and maintenance of equipment in area of engine oil tank sump.

Arresting Hook Release. Hook release cable chafes against fuselage rib frame 263.250 through which it passes. *Recommend* that a fairlead be provided

Screws on Access Doors. The left and right fuselage access doors, P/N 10-8000020-1-10, -2-10, are each fastened with 85 100-degree Frearson recess steel 10 x 32 screws of four different lengths.

The outer panel lower wing access doors, P/N 10-3000-10-1-10, -2-20, are each fastened with 200 screws of three different sizes and six different lengths.

A decalcomania attached to outside surface of each access door provides the guide to properly locate type and length of screw to be used. This decalcomania is easily scratched and in one case has been painted over by the aircraft identification numeral, destroying its value. The sorting necessary to segregate screws which have small differences in length is difficult and time consuming during removal and replacing of access doors. *Recommend* that a single size and length of screw be utilized on access doors.

Wingfold Actuating Cylinder. To gain access to the attachment point of the wingfold actuating cylinder rod end to the outer wing panel it is necessary to remove the rocket pylons and the access door between wing stations 16.58 and 95.432, which is secured with 200 flat head screws. *Recommend* that rib brace P/N 10-3000012-1-28 L.H., R.H., be installed with bolts in place of the rivets now used. Removal of this brace will permit a man to enter the outer wing panel, parallel to wingfold cylinder, to remove or install wingfold cylinder rod end attachment bolt. This will eliminate otherwise necessary removal of rocket pylons and large access door.

Wingfold Cylinder. After 52.8 hours operating time during a wing spreading cycle the left wing failed to spread, and only 500 pounds of hydraulic pressure could be built up with the hand pump.

Disassembly of cylinder, P/N 10-2068003-1, showed "O" ring, AN-6227-44, broken in six places and the three leather back up rings, AN-6246, were rolled. The diametral clearance between piston and the cylinder wall was .007" which is the maximum allowable tolerance. During bench test after assembly, fluid was found to pass the "O" ring, AN-6227-A-19, separating the spread and fold anuli of the pivot and attaching bolt. Nicks and scratches were present on the bearing surfaces and "O" ring anulus. Scuffing was evident on the bearing surfaces of the piston end head. No means other than seepage of hydraulic fluid has been provided to lubricate the spread end of the pivot bolt. *Recommend* that contractor comply with spec. AN-P-74A and that inspection techniques used for the sub-assembly be improved.

Hydraulic Pressure Regulator. The 90 degree fitting, AN-833-4D, installed in the pilot valve port of the hydraulic pressure regulator was found leaking after 48.8 hours operating time. Because of interference of the aircraft structure, it is necessary to remove the hydraulic pressure regulator. Pilot's seat must be removed to gain access to hydraulic pressure regulator. Time required to remove and replace an AN-6227-6 "O" ring on the pilot valve port fitting is two men, 16 hours. *Recommend* that the 90 degree fitting be replaced with a straight fitting, AN-815-4D, in the pilot valve port of the hydraulic pressure regulator and that a central hydraulic panel be utilized to improve accessibility for inspection and maintenance.

Oxygen Cylinder. The oxygen cylinder is located below and aft of pilot's seat. To remove the cylinder it is necessary to remove seat. Oxygen cylinder bracket clamps are partially blanked by pilot's armor, making access to clamps difficult. Removal and replacement time for oxygen bottle is one man, one hour. *Recommend* that contractor comply with paragraph 204A of SD-368-1A.

Pilot's Seat. On four occasions the pin pulling mechanism for adjustment of pilot's seat has failed. Flexible strand cable broke twice, adjacent to seat control handle. Strand cable housing pulled from clamp attaching it to seat at the control handle. This clamp is provided with a lug to prevent clamp rotation around its attaching screws. Lug shears when control handle is moved, since stops are not provided to prevent movement of the handle after pins are pulled. *Recommend* that manufacturer provide a dependable pilot's seat adjusting mechanism.

Canopy Emergency Accumulator. After 76.8 hours operating time, hydraulic pressure was lost in the cockpit canopy emergency system. Bladder, P/N 402969, was pinched and ruptured between sealing cap P/N 404197 and the accumulator shell.

Gun Charger. Bendix Mk 5 charger, P/N 83600, driving lugs, AN 83926, broke in the anulus aft of the lug after firing 1900 rounds from number two cannon and 2300 rounds from number three cannon.

Firing Pins. Pins have broken at the striker, one after firing 1800 rounds from number two cannon and one after 3405 rounds from number one cannon.

Breech Block Lock. Left lug of the breech block lock broke where the breech block slide contacts the lug, after firing 847 rounds.

(Continued on page 39)

SUPPLY NEWS
FROM ASO AND SUPPLY DIVISION BUAER

Aeronautical Supply in 1947

The following items summarize the 1947 Aeronautical Supply developments believed of interest to pilots and aircrewmen.

ECONOMY

Economy is the watchword throughout the Aeronautical Supply Organization. Appropriations are extremely limited for some phases of supply, especially for "Transportation of Things." The BuAer Spare Parts Recovery Programs, by means of which war surplus airplanes and engines were dismantled for useful parts, have been mostly completed, but net returns of needed parts were not so good as anticipated.

The use of substitute materials still available from wartime stocks has been encouraged to the utmost, where and when this would net true economy without impairment of safety. Increasingly better usage data have enabled closer buying of parts peculiar, especially for new program aircraft—always most difficult of estimation. Stock levels for retain issue points generally have been reduced, although permissible inventories on hand and on order for wholesale points have been increased because of the increased procurement lead-time required for today.

Considerable material previously earmarked for disposal to civil industry has been withdrawn from WAA and retained for naval needs because pressing requirements for such material no longer exist in the civil economy, and also because costs of most materials have about doubled since the war ended.

STANDARDIZATION

Joint conferences of both high-level and low-level types, constant emphasis by BuAer, greater attention by BAGR's and BAR's, and other steps have produced a remarkable increase in the use of preferred standards as a major means of simplifying airplanes and their equipment.

Two very important conferences were held during the year, one at ASO on Airframes, attended by high-level representation from the Air Force, Industry, and the Navy. The Air Force sponsored the second conference at Air Materiel Center, Dayton on Power Plants. As a result of the latter conference, it may be confidently expected that in the future stud bolts and similar utility items will be established as industry standards and used to a large degree in all makes of engines. Both the Air Force and the Navy have been most emphatic in their demand on Industry to increase the use of preferred standards as a means of facilitating industrial mobilization in time of emergency, cutting costs, and reducing the problems of maintenance and supply.

It should be added that the Aircraft Industry has been most cooperative and is earnestly endeavoring to simplify its designs and increase the use of preferred standards.

JOINT ACTIVITIES

The Air Force and the Navy have continued many of the wartime agreements for cross-procurement wherein the Navy purchased all Pratt and Whitney engines and parts, for example, and the Air Force bought all Wright engine material for both. The Supply and Maintenance Requirements Committee of the Aeronautical Board continues to meet each month and consolidate agreements between the Air Force and Navy as to standardized maintenance and supply procedures.

For example, procedures governing periodic maintenance (30, 60, 120 hour checks) and the like, will soon be made AN Standard. Aeronautical Board Case 218 epitomizes Air Force and Navy agreements as to budgetary limitations equitable for all supporting material required in maintaining and operating airplanes.

PUSH BUTTON SUPPLY

Automatic supply, involving use of mechanized equipment at ASO, has become a reality in the distribution of engine parts. It is also being used to some extent in stock control for a considerable proportion of the accessories and instruments. Its application to the stock control of Airframes is still questionable. Suffice it to say that "push button" supply considerably reduces manpower requirements as well as costs of doing business, and reduces mistakes. However, there is no machine substitute for human judgment and thinking ability—accordingly, ASO continues to encourage the training and development of highly specialized experts.

SPECIALIZED SUPPLY OFFICES

The pattern developed in the Aviation Supply Office (which is guided in functional supply matters by BuSanda and in technical supply matters by BuAer on the "what" to buy and distribute) has been extended to most other categories of naval material. Supply-Demand control has been set up in an Ordnance Stock Office, a Submarine Supply Office, an Electronics Supply Office, a General Stores Supply Office, et al. This pattern has proved most efficient for integrating and coordinating technical and functional supply.

PRESERVATION

The recent war would have cost 15 to 20% less had present day packing and preservation methods been known and used. Most aviation spare parts are quite perishable and their high cost per pound or cubic foot warrants very careful protection. The use of hermetically sealed cans for protecting spark plugs, generators, starters, and other electrical or electronic material—of plastic strip coatings for engine and propeller gears, studs, piston pins and thousands of other parts of precision-finished steel—of special waterproof wrapping and dipping methods for frictionless bearings, etc., has increased.

PUBLICATIONS

There is a determined drive to reduce the range and variety of publications, as well as their cost. The cost per page of the ASO Catalog has been reduced over 50% since the war ended in spite of rising costs of material and labor. The value of the ASO Catalog, as well as other portions of the Catalog of Naval Material, has been proved and all cataloging functions are vigorously supported. More "know how" and high-level attention is to day devoted to the Catalog than ever before.

Some A/N publications have been dropped and others combined; e. g., "The Army-Navy Index of Aeronautical Equipment" has been discontinued. The "Maintenance Parts Breakdown" and "Illustrated Maintenance Parts Catalogs" have been merged. Technical Supply Bulletins and similar news sheets have been found most helpful in reporting spot news, informative though not directive, such as supersedures, changes, parts allocations, corrections, substitutions, availability, and the like. TSB's have been consolidated.

'Luxury Items' Discontinued

In addition to discontinuing the procurement of wrist watches for aviators, as previously announced, BuAer has decided also to stop procurement of suitbags, handbags, brief cases and similar "luxury items."

Full details as to the issue and stock control of luggage will be issued later. BuAer's plan contemplates careful rationing and use of stocks remaining available. No additional funds for repair of these items will be allocated in the future.

'Rain Makers' Want JM-1's

Although the Navy's JM-1 aircraft had previously been determined as commercially unsalable and the War Assets Administration had instructed that they be scrapped, a sudden new demand for them has arisen in the development and practice of the new science of "rain making." This innovation was reported on more extensively by *Time* magazine in early September.

Shortage in Aircraft Armor

Shortages still exist in the supply of aircraft armor needed by A&R shops in overhauling aircraft to the proper configuration. All aircraft armor peculiar to current aircraft must be returned to accountable supply officers immediately after removal from an airplane in fleet service, training, or pools.

VMF-115—The squadron recently participated in an extensive search for two Army pilots missing in an AT-6 from Wheeler Field. The squadron flew until dark and continued the search at dawn the next day with negative results.

VR-1, Patuxent River—Pilots in VR-1 are attending a five-day ground school on the theory and practical use of Loran. Following a checkout in ground school, the pilots are given a check flight—usually a round trip from Patuxent to Bermuda.

AVIATION ORDNANCE

INQUIRIES SHOULD BE ADDRESSED TO THE CHIEF OF BUREAU OF ORDNANCE

Improved Gas Vent Is Approved

The improved gas vent plug, Bureau of Ordnance Drawing B652893, for the 20 mm. M3 aircraft gun has been approved for manufacture and will replace the standard gas vent plug, Army Ordnance Drawing B7229626. The improved gas vent plug was developed by Bureau of Ordnance and tested by U. S. Naval Proving Ground, Dahlgren.

Firing tests have proven that the new part is far superior to the standard part. The standard part usually fails between the second and third 200-round burst, whereas the improved part will last well over 5,000 rounds, the life of the gun.

The improved gas vent plug differs from the standard part in that the material is more resistant to erosion and corrosion. The gas vent passages have been increased in diameter from 0.081 inches to 0.086 inches. The two gas passages are drilled on an angle of 45 degrees to the center line of the part, whereas for the standard part the gas passages are radial to the center line.

By drilling the gas vent passages on an angle, resistance to the flow of gas is decreased, thus reducing wear. Last, less metal has been removed from the center of the gas vent plug, which forms the main gas passage. Although the gas passages have been greatly modified, there has been no reduction in the rate of fire of the gun.

20 mm M3 Gun Casualties Report

RECEIVER BODY: Attack Squadron Five Baker reported failure of the receiver body, 20 mm M3 gun. Failure occurred on the right side of the receiver just forward of the vertical dovetail groove for attaching the rear buffer. A photograph of the failure showed separation of the insert patch from the receiver body as a result of poor welding during the modification of the receiver.

During the war it was necessary to modify a quantity of M2 receivers for the M3 gun. This modification required that the integral hydraulic charger be removed by machining and welding insert patches in place where the metal was removed.

Although this is the first failure of this type received by Bureau of Ordnance and is considered to be an isolated case, frequent inspection of the receiver body is recommended. It is requested that all receivers be carefully inspected for the above failure before the next firing flight and daily after firing when the guns are cleaned and oiled. Activities experiencing similar failures are requested to report them immediately to the Bureau of Ordnance on NAVORD FORM 147. Include a photograph of the failure, serial number of the gun, name of gun manufacturer, and the total number of rounds fired when the failure occurred.

GAS CYLINDER AND DRIVE SPRING GROUP: Reports of the gas cylinder vent plug (B7229626), loosening and blowing out when firing, have been received by the Bureau of Ordnance. Maintenance activities are cautioned to carefully lock this part in place when reassembling the gas cylinder group. After the vent plug has been screwed in place it should be locked with plate (A207290). Plate (A207290) should then be secured by means of Plug (B163320) and the retaining Washer (A207291) and a cotter pin. Careful installation of these pieces will prevent failure of this sort.

Also, when replacing the drive spring guide group, care should be taken to insure that the retainer (A7227771) is not cracked and is installed properly. This part requires frequent replacement. Spares are furnished with the line maintenance spare part set, NAVORD LIST 21416, Revision "A."

Cold Temperature 20 mm Operation

Cold temperature firing tests have proved that the 20 mm M3 aircraft gun will perform satisfactorily at minus 60° F. For low temperature operation the gun must be thoroughly cleaned and be properly lubricated. Gun heaters are required and should be in operation approximately thirty minutes before firing.

In preparing the gun for cold temperature operation the following procedure is recommended:

1. Disassemble gun and thoroughly clean, using Solvent PS 661. All traces of preservative *must* be removed. To insure proper operation of the gas cylinder and sleeve group these assemblies must be removed for thorough cleaning. At this time examine the gas port in the tube and gas cylinder bracket and remove any traces of hard drying preservative. Care shall be exercised to prevent cleaning solvent from entering the recoil housing and the rear buffer. These parts are packed with a special lubricant when assembled and are not to be disturbed.

2. After disassembly and cleaning, closely inspect all parts for signs of corrosion, burrs, cracks and other defects. Check the diameter of the gas port in the gas cylinder vent plug for the correct size. This dimension should be 0.081 inches and can be easily checked using a number 46 drill. If the gas vent is eroded the vent plug shall be replaced. Examine the driving spring for correct free length. The free length of a new driving spring will be approximately 26.5 inches. Springs below 24 inches shall be replaced.

3. After thoroughly cleaning allow all parts to dry and then wipe them with a clean, lintless, dry cloth. Protect all parts against moisture and particularly perspiration. Apply a medium coat of OS 3161 oil by wiping with a cloth prepared as follows: Dip a clean cloth into the oil and squeeze it in both hands until the oil does not run or drip from it. Keep your hands, tools, and work bench free from dirt and moisture. A well lighted room is best for this work.

4. Assemble the gun with care. Check to see that the hole in the gas cylinder bracket is over the gas port in the barrel. Before installing the heater, check for continuity of circuits. Check the operation of the heater before the flight. Be sure that safety wire and cotter pins are used where required.

5. To insure proper operation of the gun it must be cleaned and lubricated after firing 600 rounds. More frequent cleaning is recommended if conditions will permit. If practicable, the breech block assembly should be cleaned and oiled after each firing flight.

When firing at temperatures below —20° F, heaters are required and should be operated thirty minutes before firing if the guns are actually at temperatures between —20° F and —65° F. Lubricating oil is required for operation at all temperatures, and oil OS 1361 is the best all temperature gun lubricant presently available. Lubricating oil OS 1361 must not be diluted with kerosene. Cold temperature firing tests have proved that no advantage in operation is gained by mixing kerosene with oil OS 1361. At temperatures above —20° F such a mixture is not satisfactory. Proper maintenance cannot be overstressed to assure satisfactory performance of the gun at all altitudes and under all weather.

THE HOWLER

Emergency Escape Provisions. The attention of activities operating JRF-5 aircraft is called to Technical Order 106-43 of 8 November 1943: *Inspection of Emergency Escape Provisions.*

Information received by BUAER indicates that trial use of such mechanisms has revealed failure to operate because of corrosion and lack of lubrication. Adherence to the instructions in the Technical Order regarding inspection and maintenance of escape provisions may prevent loss of life due to failure in an emergency.

Corrosion Trouble on PB4Y-2. VP-HL-13 has reported breakage of nose wheel door pivot assembly, P/N 32B9732, in all planes approximately every 30 hours.

It was found that the failure was due to corrosion and subsequent freezing of threads at the lower end of the nose wheel door push rod assembly, P/N 32B9663. The corrosion is attributed to the presence of high humidity in the area of Kaneohe Bay, Oahu, T. H., together with the absence of lubrication provisions on this assembly.

VP-MS-1—A transport 250 miles from San Juan radioed for help, saying it had a seriously-injured man aboard who needed immediate medical aid. A squadron *Mariner* flew to the ship, made an open sea landing and took off at twilight. Four and a half hours after it got the call, the plane delivered the man to the dispensary in San Juan. The plane was in the air 45 minutes after the call came in.

VMF(N)-513—This squadron recently operated aboard the USS *Bairoko* (CVE-115) for 17 days. Training consisted of qualifications, rocket firing, bombing and gunnery on a sea sled, navigation, fighter direction and attack problems. The squadron received a "Well done" from the CO of the *Bairoko*.

Title	Order No.
HARDWARE AND RUBBER MATERIALS	
Tires and Tubes	
Aircraft Tire Maintenance Storage and Repair Instructions (Reissue) 1947.	NavAer 01-1D-506
General Inspection, Maintenance, Storage and Disposition of Vehicle Tires and Tubes, (Reissue) 9/23/47.	A.T.O. 19-1-125
ARMAMENT	
Link Chute Assemblies	
§Handbook of Operation and Service Instructions for AN 11-10H-1	
§Designates New Publication	

Title	Order No.
Calibre and 20MM Link Chute Assemblies, 9/15/47.	
DEPUTY CHIEF OF NAVAL OPERATIONS	
General	
Summary of Empirical Forecasting Rules for Aleutian Island Stations, 10/47.	NavAer 50-1T-35
Radio and Tide Tables	
Change No. 5 to Radio Weather Aids H. O. Pub 206, Rev. 6/47.	NavAer 50-30R-3
§Designates New Publication	

(Continued from page 35)

FH-1 (68 Hours)

Flap Emergency Stop. This part, P/N 4-67039, failed at rear housing flange while operating the flaps during a check period. Believe that torque value of actuating motor was too high. Exact values were not available from contractor, however, and definite conclusion is not possible.

Intermediate Air Duct. Duct is supported solely by two flexible connectors, P/N R-82-MDA-4-959102, one at each end. Rear flexible connector failed in flight and pieces of it entered the compressor. This resulted in restriction of compressor followed by high turbine outlet temperature. Engine was disassembled, pieces of flexible connector removed, and complete inspection made. Only minor damage was inflicted, permitting field repair.

Flaps. Two left flap, P/N 18006L, failures have occurred in same location on inboard ends at the trailing edge. An external auxiliary fuel tank was carried on all flights made during test time. Additional investigation supports original supposition that fuel tank caused turbulent air flow over flap surfaces. Aircraft was flown in various configurations, with and without auxiliary fuel tank, accompanied by observer in a chase airplane. With auxiliary tank installed, left flap was observed to vibrate rapidly through a distance of four inches at the trailing edge at speeds from 290 knots to 350 knots indicated air speeds.

Elevators. Both elevators, P/N M4-22001L, and M4-22001R, installed on FH-1, BuNo. 111734, were found dished in on lower side at inboard ends near stabilizer, station 18.34. This dished in condition extended across 2/3 the width of elevators. Stabilizer fairing showed evidence of contact with inboard end of right elevator. During this flight a positive acceleration of 5.2 G's was imposed on aircraft. Pilot reported violent shaking encountered when speed brakes were opened in a tight nose-down turn at approximately 250 knots.

FH-1 (84 Hours)

E&M Instructions Incomplete. The E&M instructions, AN 01-245FA-2 for FH-1 aircraft, give no information for speed brake system. *Recommend* that description of the system with instructions for installation, removal, servicing and maintenance be provided. These instructions do not include sections concerning materials of construction or finish specifications. *Recommend* that such be provided.

Exhaust Extension. Sixteen flat head screws, P/N AN 510C8-6, are used for attachment of the exhaust extension, P/N 19E224-1. Approximately half are broken when removed at each 10-hour check. *Recommend* that size 10 screws replace the size 6 now in use.

Oxygen Cylinder. To remove the oxygen cylinder it is necessary to remove the pilot's seat, taking one man, 35 minutes. Spec. SD-24-F requires one man, six minutes for removal or installation. *Recommend* that contractor comply.

Micro Switch. Screw holding terminal post for wire FG7B20 became loose and backed out, permitting circuit to open in right main landing gear down position indicator. Failure occurred after 52 hours total aircraft time. *Recommend* that more thorough inspection be conducted during assembly procedure.

Pump Drive Spline. Failure of the oil and scavenger pump drive spline, P/N 23F-380-1, serial 54655, for J-30 turbo jet engines, after 20 hours, 41 minutes of engine time since overhaul, resulted in loss of oil pressure during flight. The following engine damage occurred: Turbine rotor shaft frozen; numbers 1, 2 and 3 bearings damaged; diffuser extension assembly, compressor housing assembly diaphragm and combustor chamber damaged. Cause of the failure is not known.

Flaps. The right flap failed on both FH-1 aircraft after 60 hours. Failures were identical to left flap failure previously reported. Investigation with observer in chase plane revealed that with auxiliary fuel tank installed, considerable buffeting of the flaps occurred at speeds above 290 knots. At 350 knots the flaps continually opened and closed through a distance of approximately four inches at inboard trailing edge. No buffeting occurred at speeds up to 400 knots without tank installed.

Gas Turbine Starter. Westinghouse starter, P/N 1171449A, had threads on the castle section of the castle nut out of line so much that in removing the nut from both the positive and negative terminal the terminal threads were stripped.

Simple Tube Measures Skid

VF-20-A, ALAMEDA—This squadron has a tested and proved solution to the skid problem in fixed gunnery exercises. From the testimony of the pilots, the new skid indicator is more sensitive to trim and more easily seen during a high speed gunnery run than the standard sight spirit level.

SWINGING TUBE SHOWS IF PLANE IS SKIDDING

The skid indicator is an open-ended, free-swinging 6¼" piece of ⅝" st., .020 wall thickness tubing and is anchored by a No. 8 screw to the forward top-center of the upper panel of the F8F-1. The skid indicator was manufactured and installed locally by squadron metalsmiths.

▲ ***BuOrd Comment*** **— This bureau has been experimenting for some time with vane-type indicators for airplane angle of attack and skid measurement. The variation in these items definitely influences accuracy obtained with fixed weapons and should be measured and accounted for by fire control computers or by eliminating variation by utilizing pilot's ability to fly accurately.**

To date, experience of BuOrd has been that vane-type instruments are not sufficiently accurate or practicable for use with service-type planes to measure quantitatively angle of attack and slip. It is conceded, however, that a qualitative measurement may be obtained from an instrument of the type described above.

Douglas May Build Blimps

BUAER is studying proposals and costs submitted by Goodyear and Douglas Aircraft companies for production of a new antisubmarine version blimp, model XZPN.

The Douglas version preliminary design calls for a dirigible of 725,000 cu. ft. volume instead of the 930,000 cu. ft. considered necessary by Goodyear. A feature of the Douglas design is the power plant of two air-cooled engines mounted inside the car with transverse shafts driving the propellers on outriggers. Either engine could drive both propellers, which would permit high propeller efficiency and engine economy over a wide range of air speed.

Navy Tests New Landing Aid

NATS, ATLANTIC—In the never-ending search for all-weather landing systems, tactical test department of NATC PATUXENT is currently evaluating a system known as the radar beacon method.

This system uses a radar beacon at each end of the runway by which the pilot can align himself with the runway by aligning the two radar beacons on his airborne radar scope. The pilot will see both beacons continuously and may fly to keep the two beacons on the same line of bearing dead ahead.

Using in addition his radar scope to determine distance from the runway and his altimeter to determine distance above the runway, the pilot has available all three required factors for the approach. The method is reported to show possibilities of safe approaches and let-downs to 200' altitude.

LETTERS

SIRS:

In the October issue of NAVAL AVIATION NEWS, your article on the USS *Randolph* being put in moth balls states the ship was hit by an Army P-38 after she got back to San Pedro in June 1945.

I was serving on board at the time on Admiral Bogan's flag. She was anchored off the Island of Leyte when hit by the P-38 and did not return to the U.S. until after the signing of the Jap peace treaty.

W. H. KING, CQM
FAW-5, NORFOLK

¶ The *Randolph's* historian reported she was hit at San Pedro anchorage, Leyte. NANEWS neglected to include the word "Leyte" in its story to make clear that it did not mean San Pedro, Cal.

SIRS:

On the evening of 19 November *The Columbus Citizen* sponsored its annual parade inaugurating the Christmas season. NAS COLUMBUS was invited to participate on very short notice. The F6F-5, shown in the picture, was accordingly given a coat of washable paint, covered with silver metallic brilliants, and "Merry Christmas" was painted on the side.

Considerable interest in the aircraft was evidenced by the estimated 150,000 people who witnessed the parade. It might be of interest to add that the WAVE, who perched on the cowling of the plane the entire hour and a half, experienced considerable difficulty in moving her well-frozen legs, the temperature having been in the middle 30's.

E. G. COLGAN, LT. CDR.
PUBLIC INFORMATION OFFICER

SIRS:

This air station has an idea which other Reserve units might find valuable in making their activities more inviting to enlisted men. An enlisted men's wives clubroom was opened on the station, complete with coffee mess, baby-sitters and playroom so that the women will have some facilities when they accompany their husbands to the station.

The accompanying photo shows opening ceremonies, sponsored by Mrs. R. S. Clarke, wife of the CO, right, and Mrs. G. T. Hartley, left, wife of the senior medical officer. Wives in the picture are Mrs. Donald Wires, Theodore DeGroff, Al Harder, R. P. and J. L. Kennedy.

LT. CDR. E. C. INGRAHAM
PUBLIC INFORMATION OFFICER
NAS ALAMITOS

SIRS:

Utility Squadron Seven based at NAS SAN DIEGO produced a championship team in this season's softball league. Chosen to represent Fleet Air West Coast in the Eleventh Naval District play-offs, VU-7 won the Oceanic League Championship.

The final step was the play-off with the Chiefs of the Naval Air Station which VU-7 won to complete a highly successful season.

Pictured are (1st row, L to R) G. A. Ogden AM1, C. E. Carlisle S1, J. A. Jones AMM2, R. D. Burris ARM3, A. Hargress STM1, N. C. Clary AMM1; (2nd row, L to R) L. B. Larghe ARM2, C. Fittro AFC1, R. E. King ACOM, B. R. Haight AOM1, R. G. Forsyth S1, C. M. Bullock, Lt (jg). Team members not pictured are E. W. Castle AMM1 and A. L. Groves, Ens.

ONIA B. STANLEY, JR.
UTILITY WING, PACIFIC FLEET

VR-4, MOFFETT FIELD—The Navy apparently is not going to have a hard time to get crew members for the Lockheed *Constitution* (R-6-0). Twenty-five men from this squadron volunteered for training in the big transport. Moffett Field is one of the few fields with runways strong enough to withstand the weight of the *Constitution*.

VF-14-A—This squadron is now flying F8F's, having gone through transitional training from the F4U-4's it had flown the past two years. During that time, it flew missions on both coasts of the U.S., Cuba, Trinidad, Culebra and other Caribbean islands, Hawaii, Panama, Luzon, Mariannas, Japan, China and other Pacific outposts.

● THE COVER

The Navy is procuring 150 of the P2V Lockheed *Neptunes*, such as is pictured flying over Southern California's coastline. This model, the P2V-2, is just about tops in patrol-type fighting aircraft, being fast, with long range and heavy load-carrying capacity.

CONTENTS

ANSWERS TO QUIZZES

● AIR STATION QUIZ

(inside front cover)

Top—NAS Pensacola.
Lower—NAS New York.

● RECOGNITION QUIZ

(inside back cover)

Top—XB-47 built by Boeing; six J-35 jets delivering 24,000 pounds of thrust, plus 18 JATO units in fuselage delivering 18,000 pounds additional for 2.8 seconds; wingspan 116 feet; weight 62 tons; speed 720 mph in dive indicated.

Bottom — SC-1, Curtiss Seahawk, cruiser and battleship spotting plane.

NAVAL AVIATION NEWS

Published monthly by Chief of Naval Operations (OP-50-D) and Bureau of Aeronautics to disseminate safety, survival, maintenance and technical data. Air mail should be used if practicable, address to: Chief of Naval Operations, Naval Aviation News, Navy Department, Washington 25, D. C. Direct communication can be made to Naval Aviation News, Room 4927, Main Navy Bldg., office telephone extension 61662.

TODAY AND TOMORROW

THE FLOAT plane below was the Navy's best during the war, while the three-man, six-jet bomber above soon will fly for the USAF. Recognize them? *The answers are on opposite page.*

READ your squadron history in the new unclassified version of the Naval Aviation News. Re-live the thrills and chills of combat! Get re-acquainted with your old flying buddies. Each month a different squadron will be presented. WATCH FOR YOURS! Subscribe now to Naval Aviation News, available for $2.00 a year via Superintendent of Documents.

NAVAL AVIATION NEWS

SUPERINTENDENT OF DOCUMENTS
GOVERNMENT PRINTING OFFICE
WASHINGTON 25, D. C.

PLEASE SEND THE NAVAL AVIATION NEWS FOR ONE YEAR TO THE FOLLOWING ADDRESS. ENCLOSED IS A CHECK (OR MONEY ORDER) FOR $2.00.

NAME.....

ADDRESS.....

CITY..... ZONE..... STATE.....