

NAVAL AVIATION

NEWS



43rd Year of Publication

JANUARY 1962

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THE TAMING OF GUADALUPE PASS

Not many months ago, a transcontinental helicopter journey was classed as an adventure, a seven or eight-day trip punctuated by fueling, weather and mountain-crossing delays. When the new all-weather, jet powered HSS-2 was delivered initially to the Pacific Fleet for duty, a flight of five helicopters made the 2350-mile transit from Florida to California in 17 flying hours. A new age in U.S. Navy helicoptering, combining greater speed with improved ASW capability, had arrived.

FORTY-THIRD YEAR OF PUBLICATION, JANUARY 1962

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■ COVER

LCol. Robert B. Robinson and "Skyburner," the Phantom II in which he set an unofficial world speed record of over 1600 mph at Edwards AFB, 22 November, 1961. For more on the flight, see pictures (pp. 20-21) and Col. Robinson's story (p. 22).

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NAVAL AVIATION NEWS

HSS-2 Sets Three Records Scores on 100, 500 and 1000 Km.

A Sikorsky HSS-2 *Sea King* helicopter claimed three world class speed records after speeding over a closed circuit course between Milford and Westbrook, Connecticut.

Flown by Capt. Bruce K. Lloyd, Director Service Test Division of NATC PATUXENT RIVER, and Cdr. E.J. (Jack) Roulstone, the twin-turbine aircraft set marks of 182.8 for 100 kilometers, 179.5 mph for 500 kilometers and 175.3 mph for 1000 kilometers.

HSS-2 broke its own 100-Km. record set in May 1961 of 174.9 mph, the 500-kilometer record set in July 1960 of 148.5 mph by a Bell HU-1, and a 1000-kilometer record set in July 1956 of 132.6 by the Army H-34 (S-58). The HSS-2 also holds the three-kilometer helicopter straightaway speed record of 192.9 mph set May 18, 1961.

The flights were made under supervision of the National Aeronautic Association, American affiliate of the

record-certifying *Federation Aeronautique Internationale*.

Application for recognition of the marks as official has been submitted.

NAMP February Conference New Manual to Reflect Discussions

A Navy-wide conference on the status of the Naval Aircraft Maintenance Program (NAMP) will be held in Washington 5-9 February. Representatives of BUWEPs, major naval air command staffs, ComFair/ComNABs staffs, and major air station maintenance departments will attend.

Tentative plans call for ComFair/ComNABs to report status of the NAMP at each station. These reports are expected to highlight major problem areas.

Working panels of conference members will then be assigned to study these problems and make recommendations. Other agenda items will be presented in the form of chapters and parts of the proposed maintenance management manual which BUWEPs expects to issue in 1962.

The manual will include appropriate information currently covered in a number of BUWEPs Instructions.

Navy Transit IV-B Launched Carries TRAAC Satellite Pickaback

The launching of the *Transit IV-B* satellite 15 November 1961 marks another major step by the Navy toward the development of a worldwide, all-weather navigational system for air, land or sea. Launch vehicle was a USAF *Thor-Able-Star* rocket.

Transit IV-B carried pickaback the Navy's new asymmetrical satellite TRAAC (Transit Research and Attitude Control) to test the feasibility of employing the earth's gravitational

field to stabilize a satellite with its face permanently turned toward the earth.

The *Transit IV-B* is the second space vehicle to carry a nuclear power supply, the nuclear nonfissionable radioisotope power supply called *Snap* which will power two of the four transmitters. The power unit was developed by the AEC and the Martin Company in Baltimore, Md. The Applied Physics Laboratory of the Johns Hopkins University, prime contractor for the *Transit* program under BUWEPs, adapted the nuclear-fueled package for use in the navigational satellite. *Transit IV-A*, launched 29 June 1961, was the first satellite to carry *Snap*.

The satellites, each approximately 43 inches in diameter and weighing about 200 pounds, are now in an approximately circular orbit about 550 miles above the earth at an inclination of 32.5 degrees to the Equator. The two satellites separated as planned upon achieving orbit. At this inclination angle, *Transit IV-B* will best examine the gravitational field along



CAPT. LLOYD (L) AND CDR. ROULSTONE



TRAAC (BELOW) AND TRANSIT IV-B

the central belt of the earth and is expected to provide additional information on the ellipticity of the earth's midriff.

Three of the Navy's earlier *Transit* satellites still in orbit have provided information upon which our knowledge of the earth's shape and gravitational field is being improved. The *II-A* and *IV-A* satellites have each been used in navigational experiments employing a moving experimental range ship. In these experiments precise ship positions were determined with the data obtained from the satellites. The worldwide navigational system is expected to have operational capability by the fall of this year.

Lexington on WestPac Tour Squadrons of CVG-14 are Aboard

USS *Lexington* (CVA-16) with her crew of 1700, sailed from NAS NORTH ISLAND in November for a seven-month tour with the Seventh Fleet in the Western Pacific. Aboard was an air group of CVG-14 from NAS MIRAMAR, composed of VF-141, VA-144, VA-145, VA-146 and VMF-323.

A major part of the deployment is patrol duty in the South China Sea. In her itinerary, the *Lexington* was scheduled to visit Hawaii, Guam, Manila, and Hong Kong.

The 40,000-ton carrier returned from the Western Pacific last June and spent the Stateside months in overhaul and on training operations.



AN 8-FOOT LIKENESS of the late and famed polar explorer and Naval Aviator, RAdm. Richard E. Byrd, became the first monument to be placed on the "Avenue of Heroes," on the formal approach to Arlington Cemetery.

Antietam Aids Storm Area Helps 'Hattie's' Honduras Victims

USS *Antietam* rendered aid and assistance to victims of Hurricane *Hattie* in British Honduras.

On board the carrier to render assistance were Helicopter Squadron Eight with 15 HO4s helicopters and 37 officers, Marine Helicopter Squadron-264 with eight HUS helicopters and 12 officers, 48 medical officers,

four nurses and 86 hospital corpsmen.

After the *Antietam* had been on the scene four days, it departed leaving six Navy doctors and six helicopters with 18 pilots and 25 crewmen to render further assistance at the request of the British officials.

Helicopters from the aircraft carrier airlifted 81,000 pounds of food, 18,144 pounds of water, 12,240 pounds of general supplies and 4,500 pounds of medical supplies to Belize, Stann Creek and other points hit by the hurricane.

The helicopters also flew 207 sorties carrying doctors and corpsmen to disaster areas. Some 15,000 persons were inoculated against typhoid by Navy medical teams.

Other ships involved in the relief operations were destroyers *Bristol* and *Cory*, and the oiler *Nespelem*.

Mostest Record Is Broken Landings Made Sans Overhaul

At NAS ATSUGI, MAG-11's mobile arresting unit (*Mostest*) broke its own previous record by making 3200 successful landings without requiring a complete overhaul of equipment, an outstanding record.

The *Mostest* system consists of two hydraulic compression cylinders which are connected by two cables (see *NANEWS*, June '57, p. 19). When a tail hook from a landing aircraft catches one of the cables, pistons compress fluid in the cylinders to form a braking power and slow the craft to a stop.

The unit is designed for short field operations that enable carrier-type aircraft to operate in spaces too short for their normal landing roll. The 60-ton equipment is completely mobile and can be packed, ready to move, in ten hours, installed and ready for operation within the same length of time.

When used on standard length runways, the equipment can be used to practice short field landings, and is frequently used in such emergencies as hydraulic failures, damaged landing gear, and late touch-downs.

MAG-11 operated the first land-based arresting gear in the Far East on 17 September 1958 during strategic maneuvers in Ping Tung, Taiwan. Since then, MAG-11 has arrested over 14,700 aircraft landings. According to MAG-11, this is approximately twice the number recorded by other groups having the same specifications.



PRE-GAME FESTIVITIES in the Municipal Stadium, Philadelphia, featured a golden Navy jet aircraft pulled by an ancient Army "biplane" before the Army and Navy teams tangled in the annual football classic before more than 100,000 spectators. Bill, Navy's mascot, rules in the FIF.



GRAMPAW PETTIBONE

Cool Man in a Hot Spot

A big attack carrier was steaming in calm seas just off the Florida coast. A *Crusader* spotted on the port catapult had just turned up to full power and the pilot had saluted as ready to launch. The catapult officer gave the firing signal and the FSU lurched ahead as the catapult fired.

As the shuttle moved forward, the starboard main landing gear wheel of the *Crusader* broke off at the axle and the plane accelerated down the track with the starboard strut tearing huge splinters out of the deck. The broken wheel ricocheted up into the starboard wing and again into the outboard edge of the starboard aileron, bending it up at a 45-degree angle before bouncing clear. During the last 45 feet of catapult run the broken wheel strut sheared off, the right wingtip dropped to the deck and the FSU's nose swung 15 degrees to the right. The pilot selected afterburner as the *Crusader* went off the bow with the right wing down and in a severe left yaw.

Using left rudder and aileron the pilot retained control and climbed



steadily out to 15,000 feet, heading for the nearest divert field, a large Naval Air Station.

While inbound the plane was given a slow flight check and was found to handle well at 140 knots in the landing configuration. Ejection was now

ruled out by the pilot and he decided to land it.

The field ashore was alerted for an emergency arrested landing, and the runway was foamed.

The first pass for a landing resulted in a perfect touchdown on the port main and nose gear approximately 2000 feet short of the water squeezer arresting gear. The *Crusader* rolled over the wire right on centerline but the tailhook missed the wire! Warned by the LSO who had been monitoring his approach, the pilot poured on full power and took a successful wave off!

The pilot climbed the *Crusader* back into the landing pattern and calmly orbited the field while the ground crew checked the arresting wire. Excessive sag was discovered in the wire and tire sections were inserted to bring it up to the proper height.

With the field now ready to take him again, the pilot made another perfect touchdown, picked up the wire successfully and slid to a stop only slightly to the right of centerline after 750 feet of runout in the foamed area. Damage incurred in the emergency landing was negligible.



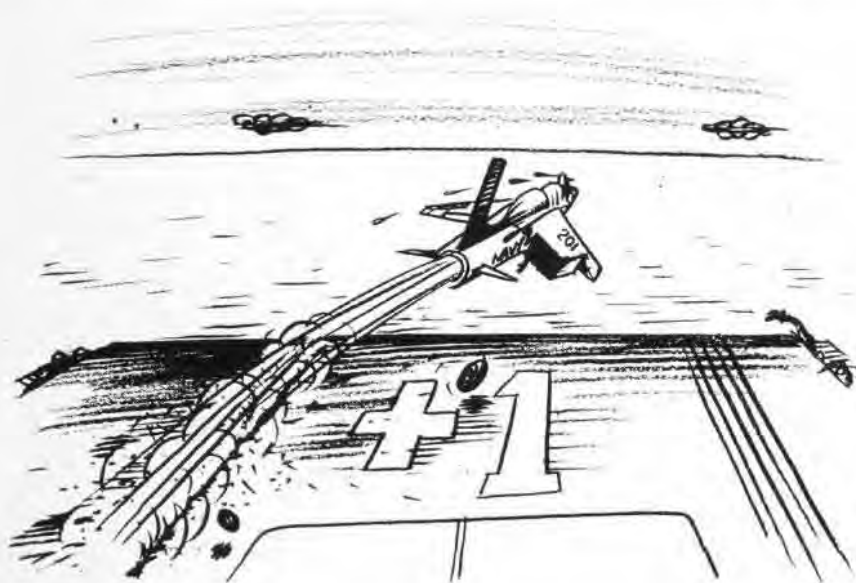
Grampaw Pettibone says:

Bust my buttons! This real pro, a fighter pilot with 838 hours in the *Crusader*, really brought home some very expensive bacon after being catapulted into an almost impossible situation. The FSU proved itself again as a good sturdy bird.

The failure which triggered off this whole deal was a fracture of the axle at the hub, apparently due to instantaneous overstress. Everybody and his brother is workin' on finding an answer to this problem and until they come up with the magic solution, FSU maintenance men better be razor sharp on strut servicing and axle bending checks. A strut bottoming on cat shot can give a real Karate blow to an axle and write off the whole bird.

Memo from Gramps:

Simple as it sounds and though it only has one syllable, the hardest word in the world to say is "NO". With each



month that goes by, an accident report crosses my desk that says as surely as though it were listed in the conclusions of the AAR Board, "Somebody didn't have the guts to say "No"!"



It doesn't have to be the C. O. Why should he always be the hatchet man? The Ops Officer, Training Officer, or Exec could have a little more iron in the backbone too. Military flying is not a profession in which every man is trying to win a popularity contest.

We fly to train ourselves to FIGHT and to fight so well that no man on the other side, whoever he may be and no matter what the color of his eyes or skin, will EVER be our equal. The very nature of Naval Aviation and the fast mobility of our striking forces will almost always mean that we'll fight another guy who'll have numerical superiority, so we have to be twice as good as the average pilot anywhere!

Someone has to cull over the flight schedule to make sure each man progresses normally toward attaining this goal and doesn't run before he's learned to walk and to keep the chargers from expending themselves needlessly. This then becomes the time for decision and the exercise of true leadership.

A pilot who flies an 0730 hop on Friday morning should never be cleared for a long "nav training" cross-country RON hop that night. Either the night hop is worth scheduling and worth bringing him on duty at the hour you'd normally have the night flyers come in, or IT SHOULDN'T GO!

A tired pilot's instrument scan all too often breaks down. He makes errors that would make a NavCad blush with shame, he forgets to check NOTAMS on his destination or enroute radio fixes, collides with his wingman, stretches his fuel too far, pushes his skill in weather and just plain takes too many darn fool chances!

The younger pilots think we have

too many restrictions nowadays. Why ARE we restricted to military fields on cross-country's? Ever see a set of field arresting gear on a civil airport? Or a military type crash crew? An AD pilot slowly smothered in his cockpit at a civil airport just a month or so ago while the local fire department tried to figure out how to raise the tail of his overturned bird. Poor flight planning and lack of experience put him in a spot he couldn't get out of. He wasn't ready for a cross-country. Someone should have said "NO."

For the new man a "NO" is not a disgrace. Just work a little harder and earn your C.O.'s recognition as a man to whom he can say "YES." A really good professional fighting man can go anywhere, anytime, and has the judgment to know when to say "NO" to himself. That's when you've REALLY earned your wings!

Risky Business

An HUP-3 was busily engaged in transferring mail from a big CVA to a nearby aviation supply ship. As he hovered over the fantail, his aircrewman opened the hatch and prepared to lower the mail sacks with the hoist to the supply ship's aircrewmen waiting below.

The pilot had to override an air vent just ahead of the fantail with his forward rotor in order to make the drop in the assigned area and, at the same time, raise and lower the helo in phase with the ship's pitching motion to avoid a collision with the obstructions ahead and below him.

Suddenly the helo seemed to lose

phase with the ship's motion and the forward rotor struck the air vent, shattering the blade! The HUP's nose fell through and struck the deck right in the midst of the deck crew, then rolled rapidly to port and over the side, shattered helo blades flying in all directions.

As the helo sank, the aircrewman fought his way through a hole in the fuselage and to the surface. The pilot went down with his aircraft. Aboard the supply ship there was one man killed and many injured.



Grampac Pettibone says:

It's about time that helo operations around non-aviation ships were taken more seriously. Blast my hide! We have no pilots or helos to waste on aerial lifts which present the hazards this operation did. Every such ship should have a helo drop zone clearly marked, fly a windsock to give the pilot the relative wind and have TRAINED responsible signalmen stationed so that they are readily visible to the pilot AT ALL TIMES, preferably in his line of vision with the highest obstruction. Only if the pilot can be warned of approaching danger can helo operations be conducted safely.

The helicopter is a mighty versatile machine, but the pilot's visibility is limited by the aircraft's structure while hovering. If length of the hoist cable and the height of obstructions require hovering in phase with the ship's motion to do the job, then the helo obviously should not be used for the lift and back to the boats we must go.



PIONEER AIRCRAFT DESIGNER RETIRES

RETIREMENT and Alfred V. Verville ought not to be mentioned in the same breath. But on 1 December 1961, this aeronautical engineer extraordinary took leave of BUWEPs at the age of three score and ten-plus one. He's off to California to enjoy many more good years.

At a luncheon 27 November in his honor at the Army-Navy Club, Washington, D.C., honor guests included VAdm. R.B. Pirie, DCNO(Air), RAdm. Paul D. Stroop, Chief of BUWEPs, Mr. Paul Garber, Curator for the National Air Museum, and members of Mr. Verville's family. Toastmaster for the occasion was Mr. Alfred D. Micotti, one of the original members of the Bureau of Aeronautics. Among other aviation leaders attending the luncheon were Adm. A.M. Pride, USN(Ret.), Gen. Robert H. Kauch, USAF(Ret.), Capt. Walter Diehl, USN(Ret.), and the Honorable William P. McCracken, first Asst. Secretary of Commerce for Air in the mid-twenties.

Letters of congratulation were read; these included messages from the Secretary of the Navy John B. Connally, Adm. George W. Anderson, CNO, VAdm. W.A. Schoech, Commander of the 7th Fleet, MGen. Clayton L. Bissell, USAF(Ret.), Gen. James H. Doolittle, and Capt. Eddie Rickenbacker.

Mr. Verville was chief planner, designer and pusher of the project which put a reproduction of the Curtiss A-1, the first plane in the Navy's inventory, into the air in August 1961 in celebration of the Naval Aviation's Fiftieth Anniversary. He shaped the 1961 version of the A-1 from the dust of the past and gave the Navy one of its great, proud, nostalgic moments.

As one of Glenn Curtiss' early assistants, he had the background to reconstitute the plans of the old A-1. From these plans, members of the Aviation Industry and the Institute of Aerospace Sciences at San Diego and NAS NORTH ISLAND created the two A-1 reproductions, one for flight and display in California, the other for the Smithsonian Institution (NANews, September 1961, pp. 20-25).

Mr. Verville's professional life spans very nearly the whole history of avia-



HE WAS A GLENN CURTISS AIDE IN 1914

tion. In February 1914, Fred Verville was hired by Glenn Curtiss. He helped with the Curtiss design of various historic airplanes, including the first "Jenny" training plane, the Model *America* flying boat and others.

During WW I and after several years in private industry, Mr. Verville was hired by the U.S. Army Service, McCook Field, Dayton, Ohio, and became a fighter plane designer. In 1920, the young engineer gained national prominence when his Verville-Packard *Racer* won the first Pulitzer Speed Classic Trophy.

From December 1921 to March 1922, he went to Europe with Gen. Billy Mitchell, then Assistant Chief of the U.S. Army Air Service, to assess the program and development of aviation in western Europe after WW I.

Upon their return, Gen. Mitchell asked Verville to design an airplane to be used as the Air Service entry in the 1922 National Air Races. To fulfill Gen. Mitchell's request for "tomorrow's airplane today," Verville designed and Sperry constructed a monoplane with a thick low wing and clean lines. This plane was one of the first airplanes with retractable landing gear folded into the wings.

In 1922, the Verville-Sperry *Racer* failed to win because of lack of sufficient power, but in 1924 with a Curtiss D-12 engine and wing radiator it flew away with the Pulitzer Speed Trophy at an average speed of 215 miles per hour.

Gen. Mitchell at once recommended the low-wing monoplane design with retractable landing gear to be adopted for fighter aircraft. This was not done until about 12 years later. That the Verville design was far ahead of its time is shown by its similarity to the configuration of WW II fighters.

The importance of the Verville-Sperry *Racer* design was recognized in 1961 when a panel consisting of four of the country's outstanding aeronautical authorities—Grover Loening, Gen. James Doolittle, Dr. Jerome Hunsaker, and Dr. John Victory—selected the 12 most significant aircraft of all time. The Verville-Sperry *Racer* was one of the twelve.

Between 1925 and 1941, Alfred Verville designed and built planes—for a few years he had his own company—worked for the U.S. Bureau of Air Commerce for two years, was employed by private companies and served as a consultant. The Buhl-Verville *Airster* (1926) received the first airworthiness certificate issued by the Department of Commerce.

In 1941-42, he worked with Curtiss-Wright, Buffalo, as Executive Engineer and head of the Technical Data Division. He later was consultant on glider and wooden aircraft projects.

In 1945, he was appointed to the Navy Technical Mission to Europe which was sent abroad in June of that year to evaluate the aeronautical programs in Europe and collect data with the aim of advancing U.S. Aviation. He recommended that German scientists be brought to BUAER to give the Navy the advantage of their know-how. He was asked to remain with BUAER to expedite the program. As a member of the Technical Data Division, he was the principal Navy consultant in laying the groundwork for exhibits for the National Air Museum.

Some Verville inventions have found wide use outside of aviation. He invented rubber vibration isolators, the CO2 fire extinguisher, and in 1920 developed the Verville-Stokes litter still used throughout the Navy.

The technical know-how of one of aviation's greatest engineers has in the last 16 years been put to the service of the U.S. Navy in unforgettable and significant ways. —I.W.R.



COMMISSIONING

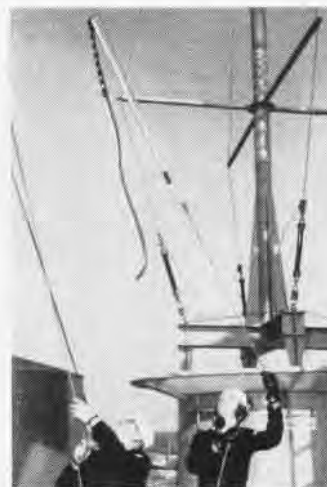
November 25, 1961

NEWPORT NEWS SHIPBUILDING AND DRY DOCK CO.
NEWPORT NEWS, VIRGINIA



ON 25 NOVEMBER, impressive commissioning ceremonies attended by thousands in the hangar deck of the 85,550-ton, nuclear-powered aircraft carrier, took place at Newport News, Va. Armed with 200 Navy attack airplanes, Enterprise will represent tremendous power.

Commissioning pennant high, the USS Enterprise and her crew begin the task of 'living up to the advance billings,' for everything about CVA(N)-65 is defined in the superlative degree. She is the 'largest . . . the first . . . the most . . . the latest.' SecNav, the Hon. John B. Connally, said Enterprise would 'rule for a long, long time as Queen of the Seas.' Propelled by the 'most powerful' atomic plant asea or ashore, the ship will have greater range at greater speed than any previous carrier. The first CO, Capt. Vincent dePoix, surrounded by superlatives, challenged his crew with still another. 'Enterprise,' he said, 'is the most illustrious name in our Navy's history. . . . It carries with it the responsibility to keep the name untarnished. The latest Enterprise has the potential to make its own great name. But we (the crew) are the ones who must bring it to life.' ★ ★ ★



WORLD'S LARGEST SHIP is shown off the East Coast. Since atomic reactors need no fuel oil, added aviation fuel storage will give Enterprise air group greater range for longer periods away from port. The ship is equipped with a new Naval Tactical Data System.

OCEANA FIGHTERS TAKE F4H TO SEA



F4H PHANTOM II CARRIER QUALIFICATIONS OF FORRESTAL SQUADRON VF-74 GO OFF SMOOTHLY ABOARD THE USS SARATOGA

WHEN VF-74, the first Atlantic Fleet operational F4H squadron, completed carrier landing qualifications aboard CVA-60, USS *Saratoga*, the pilots made a total of 150 day landings and 58 night arrested landings. An additional 48 day landings were made by VF-101 Det. Alfa in VF-74 *Phantoms*. The carquals were conducted during a four-day period off the coast of Florida.

Shortly after making a low-altitude, ten-plane formation fly-over at NAS NORFOLK in honor of visiting Secretary of Defense Robert MacNamara, the *Oceana Be-Devilers* presented the Jacksonville, Fla., area with an impressive first look at the Navy's newest interceptor before landing at NAS CECIL FIELD.

Having flown the F4H since May, the VF-74 pilots averaged a total of 60 hours flying time in type when qualifications began. In order to become carrier-qualified, each pilot was required to complete a minimum of two touch-and-go and eight arrested day landings, and four arrested night landings to follow a day refresher period consisting of one touch-and-go and one arrested landing.

With the *Saratoga* flight deck virtually at the squadron's disposal for the four days, both ship and squadron personnel gained invaluable deck handling, operational and maintenance experience with the big twin-engined fighter planes, now the Fleet's first line all-weather interceptor.

By Ltjg. J. R. Allietta

The *Be-Devilers* penchant for "firsts" was indulged during the brief interval aboard when Cdr. J.S. Lake presented Lt. Dick Bishop, *Saratoga's* catapult officer, with the official designation, *Phirst Phantom Pblinger in the Pbleet*. He was also given a shoulder patch especially designed by squadron artist John Mitchell.

Original plans had called for squadron flight crews to complete only day landing qualifications, with the possibility of a small number of night landings contingent on the success of the day work. Such was the tempo of operations aboard *Saratoga* that by noon of the second day, all VF-74 crews had day qualified and five additional crews from VF-101 Det. Alfa were able to obtain day qualifications.

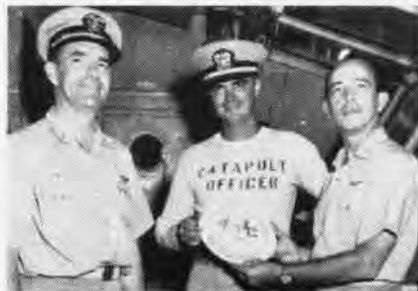
One of the early qualified pilots was Cdr. E.P. Yates, PCO, CVG-8, the air group to which VF-74 belongs. First night qualified *Be-Deviler* was

LCdr. Paul Spencer, squadron X.O.

An "open deck" system, permitting rapid refueling of aircraft following landing, was utilized during the operation. This resulted in pilots achieving the total number of landings required for qualifications without leaving their planes.

Night landings proceeded without incident, and no less than 14 VF-74 crews were awarded qualifications in the final two nights. A large share of the credit for the success of night operations was given to *Saratoga's* positive control radar system. The aircraft in the landing pattern remained under precision radar surveillance and in radio contact with a ship's controller from time of launch until the pilot reported sighting "meatball," indicating he had intercepted the landing glide slope and was in visual and radio contact with the landing signal officer.

This was the first time that ship-board flight operations have been conducted on such a scale with the F4H. In all, 12 *Phantom II's* and 22 flight crews participated in the operation, deemed eminently successful by Capt. Roger Mehle, C.O. of the *Saratoga*, and by Cdr. Lake, C.O. of VF-74.



CDR. LAKE, LT. BISHOP AND CAPT. MEHLE

• When a ski-equipped C-130 Hercules comes in for a landing at a field away from Quonset Point, home station for VX-6, the tower operator asks for a check on the landing gear before attempting touch down. Squadron pilots enjoy answering "Gear down, skis up." There always seems to be a slight pause as the tower operator thinks over this announcement.

TWENTY YEARS OF NAVY'S LIQUID ROCKETS



THREE BULLPUP B AIR-TO-SURFACE MISSILES ARE CARRIED IN A TEST FLIGHT ON A4D

THE SOPHISTICATED rocket power for Navy's deadly *Bullpup A* air-to-surface missile is the newest addition to a growing family of liquid propellant engines having their genesis in early 1941. In the intervening two decades of intensive engine design and development effort, the Navy has exploited the field of rocket technology and has pushed the liquid propellant concept to new frontiers. The self-contained, pre-packaged liquid-rocket makes *Bullpup A* a missile that requires no checking from factory to firing—it operates as a "round" of ammunition.

How does this revolutionary rocket development link with the Navy's earliest liquid-rocket engine? It all began 20 years ago when a 130-lb. thrust regeneratively cooled unit of 1½ minutes duration was developed at the U.S. Naval Engineering Experiment Station (NEES) at Annapolis, Md., under a Bureau of Aeronautics (BUWEPs) contract. Work on the controls and propellant feed systems of this engine led to the discovery of the spontaneously igniting propellant combinations now widely used. Many of the component parts of this early unit were furnished by Reaction Motors Division of Thiokol Chemical Company, the producer of the supersonic *Bullpup A*'s prepackaged LR58-RM-4 engine.

Actually, Navy's active participation in liquid-rocket development began with the assignment in March 1941 of Ens. Robert C. Truax as the first rocket project officer in BUWER. Essentially his duties in the ensuing

By Marie Pfeiffer, BuWeps

years included technical liaison with the California Institute of Technology, where the Guggenheim Foundation had established a jet propulsion laboratory known as GALCIT, making possible a rocket-assisted take-off research program. He also was responsible for the encouragement of the American Rocket Society's efforts in this field, which led to the setting up of the Reaction Motors, Inc. (RMI), largely Navy financed. In addition, he initiated an independent Navy effort to develop JATO (rocket-assisted take-off of airplanes or missiles) for large seaplanes. The BUWER project officer directed the development program of NEES. About this time the world-renowned Dr. Robert Goddard was called out of seclusion in New Mexico to work on engine development for the Navy, and he also conducted research at NEES.

Efforts of these early experimenters, plus extensive test and evaluation of captured WW II enemy equipment, eventually resulted in a Navy-developed practical jet-assisted take-off unit for Navy patrol bomber seaplanes. This was a 1500-lb. thrust liquid-rocket with the duration of 35 seconds which reduced the take-off distance of the patrol planes by 60%. It was built by the Aerojet Engineering Corporation in quantity and used by the Navy, and even more extensively by the Coast Guard. Reaction Motors followed this initial effort by building a 3000-lb. 60-second duration liquid-rocket for the Navy.

During this period, Aerojet under contract with BUWER, designed and built a 6000-lb thrust JATO unit using nitric acid and aniline as propellants. This unit was installed and tested in a Consolidated *Coronado*, four-engined flying boat, with the JATO firing under water.

An internal JATO unit using gasoline and liquid oxygen propellants was designed in 1943. Built and installed in a Martin *Mariner* by Reaction Motors, this unit produced a thrust of 3000 pounds for 40 seconds and performed very well.

Other installations of JATO on aircraft followed, and the first lessons in specific applied research had been learned. Rocket research and technical development continued. Today JATO is used to extend our launching capabilities and literally to get us out of tight spots. A seaplane flying across the United States in 1944 was forced down in a pond. It was flown out with JATO. The Navy's initial capability to deliver the atomic bomb, if necessary—before we had our modern planes and when the bomb was an awkward gadget—depended on a jet-assisted take-off of the Lockheed P2V *Nephtunes* from carrier decks. Currently, all our seaplanes and heavy attack planes have provisions for JATO use. JATO's are planned for emergency or expeditionary field operations. Today the JATO principle also is applied to rocket boosting of earth satellites.

Taming Liquid Propellants

A considerable amount of propellant research has been undertaken by the Navy under its liquid-rocket program. It became evident during the latter part of 1942 that the propellant combination then in use—"white fuming" nitric acid and aniline—had undesirable properties that rendered it unacceptable for fleet use. Preliminary studies toward improving this propellant combination were initiated in March 1943 by the Navy at NEES. This work was further expanded in May 1943 by Navy contract to the American Cyanamid Co. of Stamford, Connecticut.

After numerous tests, a mixed acid monoethylaniline propellant combination was developed by August 1943 that was considered to have properties



DOUGLAS D558-2 SKYROCKET IS BEING LAUNCHED FROM B-29 'MOTHER' PLANE

satisfactory for fleet use in jet-assisted-take-off. The American Cyanamid Co., working in close cooperation with the Annapolis project, continued investigating the propellants for high impulse propulsive devices. Several hundred propellants were tested and evaluated by April 1945. Development of nitromethane led to investigation of other chemicals as monopropellants. Work on improved propellants has continued to the present, both by industry and by naval rocket centers.

Navy men now have learned to live with and solve the problems of handling liquid propellants aboard ship, and pre-packaged liquid rocket engines have a promising future. Scientists at the Naval Air Rocket Test Station (NARTS) throughout the years, were active in the screening of a number of monopropellants, fuels and oxidizers for auxiliary and prime power plants. Until disestablishment of the NARTS facility in June 1960, work there included evaluation of high energy fuels and halogen type oxidizers. NARTS also was engaged in determining the feasibility of safe handling different fuels and oxidizers aboard ships at sea.

Inservice responsibility for the burgeoning liquid propellant rocket program rested largely with NARTS when, in 1956, the Navy turned all solid propellant work over to BUORD, with BUAER retaining the liquid propellant rocket development for all air-launched missiles. BUAER in turn, divided its responsibility for liquid-rocket work between the Naval Air Missile Test Center (NAMTC) at Pt. Mugu, flight test and evaluation; NARTS, static test and development.

Others conducting tests on liquid-rocket propellants include the Naval Ordnance Test Station (NOTS), Naval Propellant Plant, Aerojet Engineering Corp., Reaction Motors, Inc., Bell Aircraft Co., and Rocketdyne Division of North American Aviation. Engineering improvements were carried out at a number of agencies, and are continuing today.

In addition to improved fuels for then current devices, investigations of extremely high energy fuels for devices where great performance efficiency would be required were commenced early in the Navy's liquid-rocket program. The high thrust of today's powerplants for the *Bullpup* family of missiles stems from this pioneer work.

Liquid Propulsion for Air Targets

Immediately after WW II, all the armed services devoted much attention to rockets and guided missiles. Because solid propellant grains remained sensitive to temperature changes—a critical factor, particularly in the performance of air-to-air missiles—the Navy turned to liquid propellant rocket engines for a number of missiles, or, as they were then termed, "pilotless aircraft."

Application of a liquid-rocket engine to the Navy's *Gorgon* pilotless airplane (launched against an air target) marked the initiation in November 1943 of investigation of the feasibility of liquid propulsion for guided missiles. The *Gorgon*, a small radio-controlled television-directed airplane, was developed at the Naval Aircraft Factory. The powerplant was developed by the Navy's group at NEES. The small, nitric acid-aniline rocket unit developed 350 pounds of thrust for 2½ minutes. Reaction Motors (Thiokol) refined it and put it into production. A number were successfully flight-tested in the *Gorgon*. Adaptation of the *Gorgon* rocket unit design to the high-speed NACA (subsequently NASA) *Super Gorgon*, intended for investigation of supersonic behavior of aircraft, was an outcome of this program which the Navy had vigorously pursued.

Development work was commenced in June 1944 on a liquid powerplant for the *Lark* pilotless airplane as anti-kamikaze equipment. Two versions of this powerplant were developed and tested at NEES. The first was a pressurized unit later turned over to Reaction Motors for production, and the second unit, in which the propellants were fed by a pump, was turned over to Bendix Aviation for further refinement. Both constant and variable thrust engines were under investigation. The *Lark*, with several hundred flights to its credit, holds many historic firsts in anti-aircraft vehicle guidance, among them the first U.S. successful homing flight of a guided missile coming within lethal range of its target. This memorable event occurred in January 1950. The liquid rocket engine was sufficiently good and reliable enough to continue design and propellant test and evaluation by Navy and industry after war's end, and after outliving the *Lark* mission.



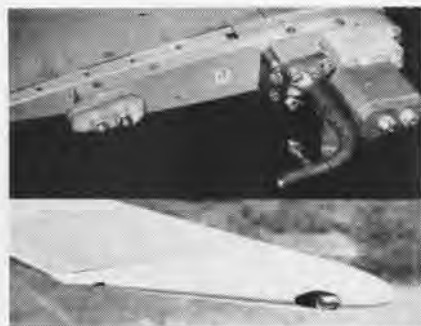
DOME-SHAPED ROCKET FUEL TANK IS MOUNTED ON THE ROTOR HUB OF HRS-2 HELICOPTER

Rocket Power for Spacecraft

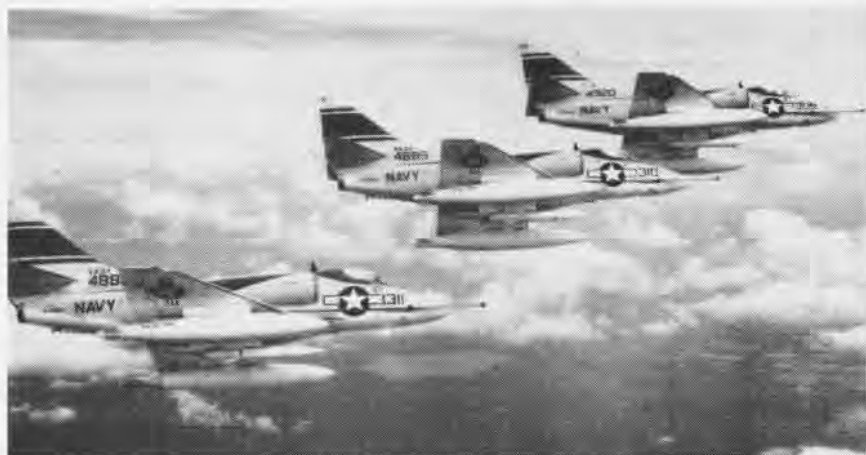
Post-war development brought turbojet and rocket engines, and with them aircraft of greatly increased speeds and altitudes. Flight potentials went beyond the testing capacity of existing wind tunnels. To obtain design information and data in this era of high-speed and high-altitude flight, research vehicles, both manned and unmanned, were powered by rockets. These projects were joint service efforts among the Air Force, NACA and the Navy.

A series of rocket-propelled airplanes and smaller free-flight research vehicles were flown in a program of high speed investigation, participated in by many interested agencies. For instance, the Bell X-1 experimental plane, flown by the Air Force to make the world's first supersonic flight on 14 October 1947, was powered by a Navy-furnished liquid rocket which delivered 6000 pounds of thrust. One of the famous Reaction Motors 6000C4 series of "work horse" rocket engines first delivered to Navy in 1946, the Bell X-1's motor incorporated four 1500 lb. thrust chambers, using liquid oxygen and alcohol as propellants. It derived power by means of a hydrogen peroxide gas generator. Thrust of the engine was 330 pounds.

The Navy's research *Skyrocket*, the D558-2, another speed and altitude record holder powered by liquid rockets, was clocked at 1065 knots at 79,000 feet back in 1951. The LRS-RM-2, -4, and -6, rocket engines of 6000-pound thrust used in the *Skyrocket* program were intended primarily for high-speed test purposes and to shorten the take-off run. Thrust could be varied primarily by cutting into operation one, two, three or four combustion chambers. Maximum thrust was obtained when the four chambers were cut in.



ROCKET ENGINE INSTALLED IN BLADE TIP



A FLIGHT OF SKYHAWKS, FLOWN BY ATTACK SQUADRON 34, CARRIES BULLPUP MISSILES

From its first flights in early 1948, the *Skyrocket* was successful and exceeded specification requirements. An extension of the *Skyrocket's* speed researches beyond the program's original requirements was decided upon by the Navy in November 1949. Douglas was assigned to continue the program by launching the exploratory craft from a mother plane at approximately 35,000 feet. Accomplished under rocket power only, after being carried aloft by a B-29 mother ship, the *Skyrocket* on 3 July 1951, attained the highest speed and altitude recorded by a piloted aircraft at that time. It marked one more step in the slow arduous battle for speed, and was considered a great tribute to the Navy, to NACA and all participants.

By 1954, the larger LRS-RM-8 single-stage rocket, consisting of four thrust cylinders of 2000-lb. thrust each, was installed in the *Skyrocket* for further testing. NACA eventually assumed control of the D558 flight program after final high-speed air launch demonstrations were completed by the Navy. One *Skyrocket* later was assigned to the National Air Museum.

Both the X-1 and the D558-2 demonstrated the feasibility of the use of rocket engines in aircraft, and encouraged many new applications. Today's high performance airplanes owe much of their success to the knowledge gained from the flight of rocket-powered research vehicles.

The engine used in the record-breaking X-1 series of research vehicles—the Navy-furnished multi-chambered LRS-RM-8—powered the initial early flight tests of the X-15 in exploring manned flight beyond earth's atmosphere. The X-15 development is a joint space flight

study begun in 1954. Although tons of data have been gathered, development will continue over a period of years. Test pilots from the Navy, Air Force, NASA (formerly NACA) and North American Aviation, builder of the rocket craft, all have flown the X-15 during its missions.

BUAER also was instrumental in developing the famous 20,000-lb. thrust single chamber liquid-rocket used successfully in all flights of the Martin *Viking* sounding rocket. The XLR10-RM-2 engine, which blasted the *Viking* to an altitude record of 158 miles in 1954, utilized liquid oxygen and ethyl alcohol. The long-range development project was undertaken in 1946 in conjunction with the Naval Research Laboratory in an effort to produce and flight test the *Viking*, then the largest American-built rocket used for upper-air research.

Success of the *Viking* caused NRL, in 1951, to investigate a new sounding rocket, a *Super Viking* capable of higher altitudes and providing greater data gathering potential. BUAER supported development of its engine, which was to provide 50,000 pounds of thrust and utilize liquid oxygen and ammonia. A unique feature of this Reaction Motors engine was the use of hot gas bleed from the combustion chamber to drive the turbo-pump.

Starting with engineering work done on the rocket engine for *Super Viking*, a rocket which never materialized because of changing requirements, the Reaction Motors Division of Thiokol set out to develop the XLR-99 for the liquid rocket X-15 project. The powerful XLR-99, which now powers the X-15 series, was planned to expand the airplane's flight capabilities.



THE LARK RISES TO SKY FROM PT. MUGU



LARK MISSILE IS SHOWN WITH LAUNCHER

Rocket Power for Helicopters

When the helicopter proved of such great value in Korean operations for troop and cargo transport, and for evacuation of wounded in mountainous areas, BUAER began to step up rotary wing research. For vertical lift and for load-carrying capability at altitudes between 2000 and 5000 feet, the helicopter requires far more power than at normal operations. BUAER began to search for a rocket power boost system that would provide the necessary auxiliary power.

During the latter part of 1945, Reaction Motors under BUAER sponsorship, began to develop a small-scale liquid rocket engine that could provide increased power to a helicopter rotor by being fitted to the blade tips. This initial device, called the ROR (rockets on rotor) had a dry weight of 7 pounds and consisted of a fuel system and three rocket engines, each individually mounted on each rotor blade tip. A series of limited tests with the ROR was conducted, but owing to lack of a definite application at the time, the project was terminated in 1947.

The development was resumed by Navy/RMI in 1950. A lightweight liquid-rocket system was sponsored by ONR in cooperation with BUAER. The XLR34-RM-2 of 25-pound thrust using hydrogen peroxide, was installed on the Kellett KH-15 one-man helicopter as its main powerplant. Flight tests were conducted during the latter part of 1954.

The success of the KH-15 project led to a Navy contract with RMI in February 1952 to develop a small ROR unit as auxiliary power for the Sikorsky HRS-2 helicopter. The engine, XLR32-RM-2, weighing less than a pound, produced 40-50 pounds thrust, or about 150 horsepower. The extra 20% boost in power doubled the payload, and gave the pilot a tremendously increased margin of maneuverability and safety in case of an auto-rotation landing. This ROR, blade tip mounted on the HRS-2, received operational evaluation at MCAS QUANTICO, Virginia, in 1955.

The special adaptability of rotating-wing aircraft as minimum-sized flying vehicles has shown its application in connection with rescue work, anti-submarine use, and mass infantry assault. The field for rocket boost systems as applied to rotary wing air-

craft is still open for improvements in design and better propellants.

LAR Project

The LAR (liquid aircraft rocket) project at NOTS CHINA LAKE, Calif., began formally in December 1949. It was the culmination of three years of technical research and exploratory engineering on liquid-propellant systems and devices. These systems and devices were designed to facilitate the combustion of liquid propellants in small rockets. At that time, it appeared practicable to make a thorough design study of a rocket of high thrust and short burning time that would compete in performance with the best small-caliber, solid-propellant rockets of the day.

In late spring of 1950, NOTS, at the direction of BUORD, undertook the experimental design and development of the novel 5.0" liquid propelled air-to-air rocket. Three years later, after two experimental designs of LAR had been made, a functionally adequate prototype of the LAR propulsion unit was tested, the 5.0" rocket motor NOTS model 500C. The propellant selected was RFNA (20% N_2O_4) and hydrazine—the latter modified with ammonium thiocyanate to depress its freezing point. Although the mechanical functioning of this model was good, further engineering effort was required to simplify the LAR design for ease and economy of manufacture.

New Prepackaged Liquid Rockets

It is easily conceivable that the basic idea for what is today a new rocket cycle—the large pre-packaged liquid-rocket—can be credited to the LAR and other early liquid-rocket engine studies by the Navy.

Packaged liquid engines burn liquid propellants which are pressurized by a solid propellant charge. The propellants are hypergolic, i.e., they ignite on contact as they leave the engine's injector. Since tactical weapon systems may require storing for long periods, the former cryogenic (liquified gas) propellant rocket engines are not practical.

The Navy/Reaction Motors design studies and development programs had shown that a packaged liquid propellant rocket engine was feasible as early as 1953. Among its many attractive features was thermal insensitivity. The propellants used in such an engine

have the added advantage of a high degree of resistance to impact shock and rough handling. Tests at NOTS and RMI proved conclusively that packaged liquid propellants may be subjected to severe abuse without detriment to the unit.

In 1952, Rocketdyne Division of North American, Bell Aircraft and Reaction Motors, were awarded contracts to make more detailed studies of storable liquid propellant rocket engines and to test a number of engine elements. These tests were highly successful. In 1954 and 1955, additional testing was made under a limited program. In August 1956, BUAER requested a proposal for a small packaged, storable liquid rocket engine for the *Sparrow III* missile. This program was awarded to Reaction Motors, and engine development began in December 1956.

The engine developed, designated LR44-RM-2, utilized inhibited red fuming nitric acid oxidizer and mixed amine fuel. It was destined to replace the solid propellant unit in *Sparrow III*. The Naval Rocket Test Center ran evaluation and qualification tests on the engine. The final decision, however, was to retain the solid propellant rocket unit.

An improved design—a larger, more powerful engine, the LR58-RM-2—was developed to replace the solid propellant motor in *Bullpup A*. A contract for production of this engine was awarded to Reaction Motors in August 1959. *Bullpup A* is the missile called "the pride of the Fleet" by RAdm. Paul D. Stroop, Chief of BuWEPs, because it is relatively inexpensive, requires no testing, and is deadly accurate. This air-to-surface missile is fired from Navy's FJ-4B's and A4D-2's. Though larger than the LR44, the LR58 engine uses the same basic principles and propellants. The LR58-RM-4 engine is now in production.

Another prepackaged liquid rocket engine, called *Patriot* by the manufacturer, was to have powered the Temco *Corvus* air-to-surface missile to supersonic speeds. Although test launchings of the missile by attack type aircraft at the Pacific Missile Range proved successful, the program was terminated in July 1960 because *Corvus* was more limited in scope than newer, upcoming Navy systems.

Start/Stop Rockets

Current Navy plans call for the

Beech XKD2B-1 (Air Force Q-12) high and low altitude supersonic missile target to be powered by a Rocketdyne developed XLR-64-NA-2 liquid-rocket engine. Follow-on vehicles will have the XLR-64-NA-4 liquid-rocket which features variable orifices for modifying the thrust.

Both types of liquid-rocket engines consist of a booster and sustainer thrust chamber, capable of being started and stopped from sea level to 100,000 ft. Both types of engines provide a maximum thrust of five minutes, and a minimum of 8.5 minutes for the sustainer phase, and 1.5 minutes maximum and four minutes minimum thrust for the booster phase.

Aside from the thrust-varying capability of the NA-4, the two engines provide similar performance characteristics.

Toward Throttleable Engines

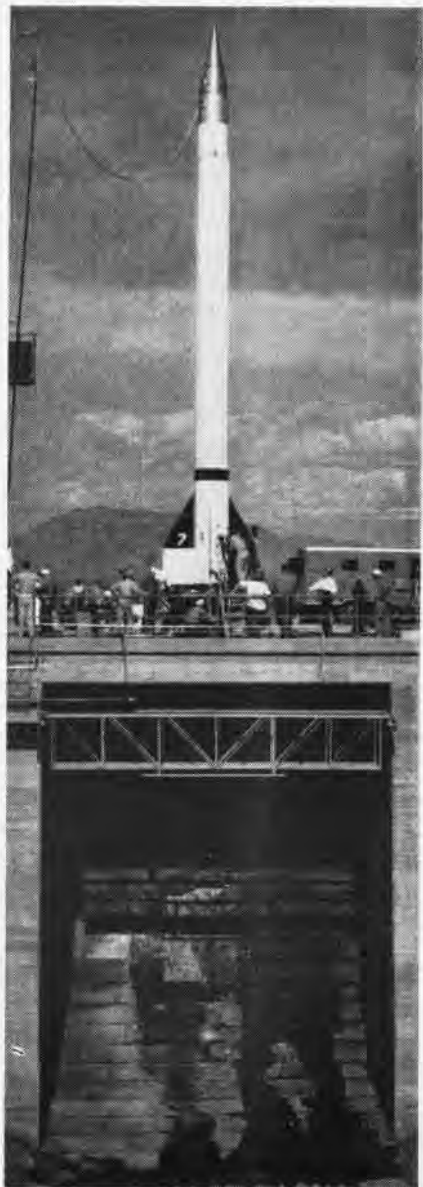
A program of applied research in variable-thrust propulsion at NOTS was directed toward advancing the state of the art. The objectives were to develop smooth thrust control of a rocket engine from zero to the rated capacity of the engine, with unlimited start-and-stop capability, and with engine operation for any required period.

Early in this program, it became apparent that the objectives could best be met in a liquid-propellant rocket engine by control of the injection of the propellants into the combustion chamber. A variable thrust hypergolic engine for rocket and missile use has now been developed by NOTS. The engine has been mechanized and tested by Moog Servocontrols, Inc., East Aurora, N.Y., and the Marquardt Corp., Van Nuys, Calif. Extension of the program to include a range of sizes and applications is underway in order to have off-the-shelf designs available for the many and varied requirements of the nation's weapon and space research programs.

In 1952, when BUAER expressed interest in a primary power, or super-performance, liquid-propellant, variable-thrust rocket—because of increased demands on interceptors—a feasibility study was undertaken by the Rocketdyne Division of North American Aviation. Experimental investigations were completed in mid-1955, and culminated in a contract for prototype variable-thrust rocket engines in October of that year. The auxiliary rocket engine was to use 90% hy-



AIRBORNE GORGON IV READY FOR LAUNCH



VIKING ROCKET IS GIVEN FINAL CHECK-OUT

drogen peroxide and JP-4 or JP-5 for its operation.

The task also involved the modification of two FJ-4 *Fury* turbo-jet airplanes, which then were redesignated FJ-4F; the installation of the LR-NA-2 rocket engines as auxiliary power to the jet; and a flight test program to evaluate the rocket engine in flight and to gain experience in the handling of hydrogen peroxide in quantity.

Rocketdyne built four versions of the new rocket engine for BUAER, all with start/stop/restart ability. They were known as LR42-NA-2. The engine tests verified the feasibility study claims, and a more comprehensive test program followed.

As the initial approach, the YLR42-NA-2 rocket engine, designed to be throttleable, was flight-tested in the FJ-4F in March 1957. The climb rate was doubled, the turning radius was decreased, the speed moved into the supersonic range from a normal subsonic limit.

Flight tests of the FJ-4F with the fixed thrust bi-propellant engine were successfully completed in January 1958. A maximum speed of Mach 1.31 and a maximum altitude of 68,150 feet were obtained.

The XLR46-NA-2 rocket engine differed from the YLR42 mostly in arrangement of components and mounting equipment. It was specifically designed for installation in the A3J. Pre-flight rating tests were completed.

The XLR54-NA-2 rocket engine, identical to YLR42 but reconfigured for the FSU-1F, also had completed the pre-flight rating test, and the XLR56-AJ-2, an engine for the FSU-3F, had commenced development, when, in January 1959, a decision was reached to hold off further development of the series. This resulted from a re-evaluation of the requirement for aircraft rocket engine superperformance in fighter aircraft and an increased emphasis on missile capability, rather than on aircraft. Budget limitations also entered into the decision, considering the cost of modifying aircraft carriers to handle liquid propellants. This early work by the Navy toward throttleable rocket engines, however, could well be the foundation for intelligent control of speeds in manned space ships.

Hybrid Propulsion Systems

Solid-liquid rocket systems offer specific impulses (theoretical under vac-



ARTIST'S CONCEPT OF XK2DB-1 TARGET

uum conditions) as high as 365 sec., high-density loading and safe handling. Attempts to use this "hybrid" approach started in the early 1930's. Among the more active investigators in this field have been Rocketdyne and Experiment, Inc.

Because of the great potential of hybrids for missiles, NOTS has also investigated hybrid systems and has undertaken development of hybrid propulsion units.

The first exploratory experiments to evaluate this hybrid method achieved the theoretically predicted results within ordinary limits of experimental error, according to a NOTS propellant expert. He has stated that over 300 subsequent experiments have proved the practicability of the approach and indicated outstanding promise for both high-energy and high-density systems that can be adapted to engine designs of any foreseeable size for chemical propulsion. Excellent agreement has been demonstrated, the NOTS expert said, between theoretical calculations and actual measured data in engines up to eight inches in diameter.

In the 20 years of rocket research, the Navy's program has come a long way from the initial 130 lb. thrust liquid-rocket developed at Annapolis in 1941. In summing up the achievements of BuWEPs and its associates in the rocket field, Adm. Stroop, whose job it is to provide the Fleet with some of the most lethal firepower in the world, noted that the rapid growth in rocket technology has made the potential of the rocket vehicle for peace as well as war obvious to all.

Navy Rocket Centers

Early in the Navy's experience with rockets, a need became evident for adequate rocket engine testing facilities. In the early days, government acceptance tests were conducted at contractors' plants. The inadequacies inherent in this arrangement left much to be desired.

In 1950, BUAER (now BuWEPs) established the Naval Air Rocket Test Station (NARTS) at Lake Denmark, N. J. There, rocket engines could be tested to military specifications, using uniform methods and standards. This activity has contributed much to the field of rocketry, and earned a reputation as a development, research and rocket engine static test center. Its chief mission was to investigate promising new developments in rocket propulsion, including propellants, and make recommendations prior to the letting of Bureau of Aeronautics contracts. In the spirit of free exchange of technical information, the facilities at Lake Denmark were open to commercial contractors as well as to all agencies of the Department of Defense. NARTS was disestablished in 1960 because of changing requirements.

NOTS CHINA LAKE, Calif., established by the old BuORD, is Navy's largest shore station, and the home of one of the world's great integrated rocket development centers. Today, developments in advanced propulsion systems for BuWEPs missiles and spacecraft represent a new level in the state of the art in liquid-propellant rockets.

NOTS research has often led the field in solid and liquid-propellant technology, ballistics, tracking and range operations, optical and timing systems, telemetry, operations analysis, and other studies.

The Navy Missile Center at Point Mugu, Calif., is the Bureau of Naval Weapons' principal missile test facility. Overlooking the Pacific, it provides an excellent over-water range for missiles launched from the main base.

The Bureau relies in large part on the vast resources of scientific knowledge and skill provided in the larger universities; on the Office of Naval Research and the National Aeronautics and Space Administration for basic research; and the pooled efforts of other armed services and industry.

FIVE SQUADRONS PATROL CHINA COAST



P2V NEPTUNES OF PATROL SQUADRON FOUR ARE SHOWN ON RECONNAISSANCE FLIGHT

FIVE NAVY air units serve as the eyes and ears of the U.S. Seventh Fleet by keeping constant watch over the international waters bordering Communist territory from Siberia to North Viet Nam.

The five units are part of Task Force 72, U.S. Taiwan Patrol Force, commanded by RAdm. B.M. Streen. The Admiral also commands FAW-1.

Task Force 72 also includes a destroyer division on constant patrol of the 90-mile-wide Taiwan Strait that separates Nationalist Chinese Taiwan from Communist-controlled China.

These surface and air units maintain surveillance patrols of the coast lines of Soviet Siberia, North Korea, North Viet Nam and the Communist-held China mainland without intruding into territorial waters.

Without such patrols, potential enemy threats against U.S. forces or our pro-western allies in the Western Pacific area might not be detected.

The five patrol squadrons operate from air bases located along a 3000-mile front, extending from the northern tip of Japan to the southern Philippine Islands. Their patrols stretch from the northern reaches of the Sea of Japan, southward to Indonesia.

The five air units include two land-plane patrol squadrons, two seaplane squadrons and a unit of WV-2's.

Two squadrons are homebased in the Far East. VP-4, which flies the P2V, is permanently based on Okinawa, while VP-40, a *Marlin* squadron is permanently assigned in the Philippines.

In addition, VP-50 flies its patrols with *Marlins* out of south-central Japan, and VP-28 flies its P2V's from southern Japan. VP-28, VP-22, and

VP-6 trade-off between the TF-72 assignment and Barber's Point.

Headquarters of this far-flung command is necessarily mobile. Operating from whichever of three seaplane tenders is attached to the Seventh Fleet at a given time, the Task Force Commander and his staff can move from one point in the western Pacific to another as circumstances require.

Although TF-72 is presently at normal strength, it can be built up rapidly with assignment of additional ships and squadrons. During the Taiwan crisis in August 1958, the task

force was expanded when an attack carrier, a Marine Corps Air Group, plus 12 destroyers and two dock landing ships were assigned to it.

With the danger of a limited or nuclear war ever present in the Western Pacific, the units of TF-72, continue to patrol the perimeter of the four Communist countries. Peace in this extremely volatile area may hang upon the whims of a highly erratic enemy.

As sentinels of the Seventh Fleet, these air and surface units fulfill their missions, aware that the security of the Far East is dependent in large degree upon their vigilance.

'Schoolmaster' Contest On Memphis Looks for Best Instructor

NATT units of Naval Air Technical Training Command are looking among their schools to find their candidates for "Instructor of the Year." Those nominated will be entered in the annual "Schoolmaster" competition conducted at NATTC MEMPHIS.

At each unit, a command letter of commendation will be awarded to each of the school winners. The top three will be given individual awards, with the "Instructor of the Year" entered in the NATTC MEMPHIS competition.



THE ICELANDIC NAMES, "Queen of Keflavik" and "Queen of Reykjavik," the Navy's new queens of the air, honor the Navy's friendship for Iceland. The titles were given by Cdr. Louis J. Pappas, C. O. of Airborne Early Warning Training Unit, Atlantic. Shown above are LCDr. Ross Mathews, aircraft commander, and Paul LeSavage, SN, who painted on the names. The two WV-2's are familiar sights in the North Atlantic from Prestwick, Scotland, to Patuxent River.

WHERE STANDS THE LSO?

NAVY NEWS

Jacksonville, Fla., November 1961... Carrier Air Group Four recently broadened its Landing Signal Officer training program by expanding it to include squadron LSO's as well as air group LSO's Although the mirror landing system has proven very effective, and the familiar signal paddles have been laid aside, the LSO has taken over another important function; today the "professional LSO" must be able to determine the safeness of an approach just by looking at the approaching aircraft.

NAVY NEWS

NANews, Dec. 1961 . . . Pilots will be able to land jet-powered aircraft aboard the nuclear carrier *USS Enterprise* automatically on a pitching flight deck under severe weather conditions.

The Navy announced the Bell Aerosystems Co. will provide 12 AN/SPN-10 systems under contract. Nine automatic landing systems will be installed in non-nuclear carriers, while two units will be available at a land base for pilot familiarization. Initial delivery is scheduled in the spring of 1962.

NAVY NEWS

Pacific Fleet . . . Two Pacific Fleet aircraft carriers are experimenting with recorded television tapes as on-the-job training aids for pilots. The *USS Coral Sea*, with commercially procured TV equipment, records each carrier landing with three cameras. Using its own closed circuit TV system, the *USS Ranger* makes kine-scopes of landings. The prime function of the recorded film is to "discipline the pilot into better performance through an accurate and immediately available debriefing medium."

Editor's Note—His wind-blown platform and hide-away net are gone. His paddles are held quietly at his side, used only for emergencies. But the Landing Signal Officer is still a vital part of carrier aviation although his role has changed considerably. Three recent news items indicate changes in the wind for the LSO. For an account of LSO's through the years and a statement regarding their present status, NANews asked Cdr. Paul Harbaugh, USNR, CVG-12, an experienced paddle-waver who has served in 33 carriers and is now training new LSO's for the Pacific Fleet, to put down his thoughts on the subject. This is his account.

IT IS UNIVERSALLY recognized that *the most precise maneuver in all of aviation is an arrested landing aboard an aircraft carrier.* This was just as true on 26 October 1922 when LCdr. Godfrey deC. Chevalier, flying an *Aeromarine*, made the first arrested carrier landing aboard the *USS Langley* (CV-1), as it is today for the current carrier pilot, flying a multi-million dollar jet aircraft, who has just now trapped aboard an angled-deck carrier.

By Cdr. P. M. Harbaugh, USNR

The progress and advancement made in all phases of carrier aviation from the *Langley* and her vintage birds to the *Kitty Hawk*, *Enterprise* and their modern brood, is a tribute to the genius of the American people.

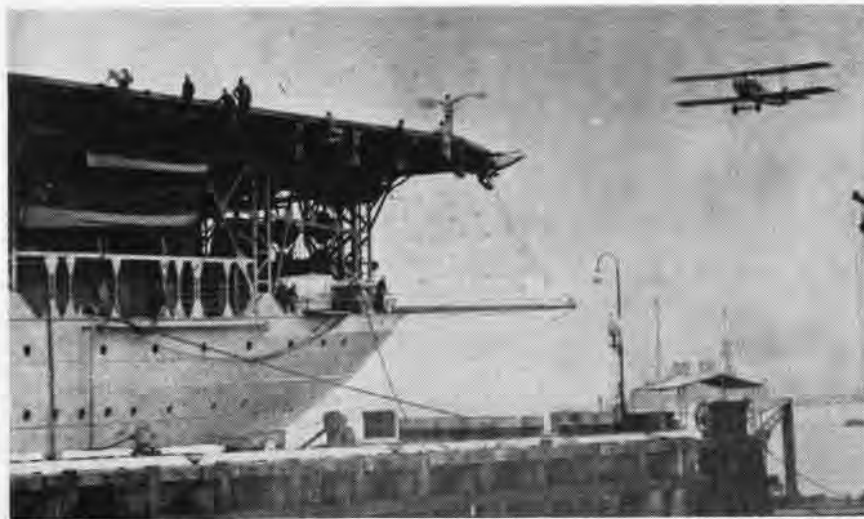
Despite these 39 years of continuing effort to advance carrier aviation, there remains today, as in the beginning, one

truly complex problem—the pilot.

The record books fail to state the exact date on which a decision was reached that carrier pilots required some type of visual guidance to assist them in determining that the sand-bagged arresting gear was rigged and that pilots had remembered to lower tailhooks.

Let's assume that this decision was reached between Chevalier's first landing in October 1922 and 21 February 1923. On the latter date, three *Aeromarines* were launched to the *Langley* in order to establish a recovery interval. The best recovery time for these *Aeromarines* was seven minutes. This operation created the requirement for numerous undocumented billets as well as established what is currently referred to as "tempo of operations." The tempo of operations dictated that air-discipline, pilot skill and teamwork were essential in order to give the aircraft carrier a combat capability.

The carrier landing phase, being the most critical part of the operation, required that a landing approach pattern be established; that safe height above the ramp of the flight deck be maintained; that the plane be flown at a precise approach speed; that the plane be perpendicular to the arresting



EARLY BUAER PHOTO OF 'ROGER' PASS SHOWS LANGLEY LSO WORKING VE-7 AIRCRAFT

cables; and that a good landing technique be used. The pilots, confronted with a moving landing platform, varying winds and sea conditions, coupled with the lack of forward visibility from the cockpit, needed assistance in order to land aboard safely. Assistance came in the form of squadron pilots armed with a set of semaphore flags standing on the flight deck between the ramp and the arresting cables.

Three signals were used to assist the pilots. First, the standard semaphore signal "Roger" indicated to the pilot that the deck was clear and that his approach appeared safe. Second, the "cut" signal indicated that the aircraft was safely over the ramp, and the pilot could take off throttle and land. Third, the wave-off signal was given by violently waving the flags over the head when it was not safe for the pilot to land and another approach must be attempted.

During the late 1920's, carrier aircraft increased in numbers and in performance. More field carrier landing practice was necessary if the new aircraft were to operate successfully aboard the carriers. The squadrons became increasingly conscious that certain pilots were more adept than others at instructing new pilots in carrier landing techniques. Thus the evolution of the Landing Signal Officers!

It has been widely written that the teamwork required between an LSO and a carrier pilot is unparalleled in military and naval history, wherein two men gamble their welfare on their performance as a team at such frequent intervals.

In the decade preceding World War II, LSO's continued to contribute their ability, judgment, and skill in advanc-



LSO ROSE IS CAUGHT IN CLASSIC ACTION ABOARD USS ANTIETAM DURING KOREAN OPS

ing carrier landing technique. They helped increase the tempo of carrier operations by giving both positive and informative signals to their pilots. Great pride and *esprit de corps* were generated within carrier squadrons because the superb pilot/LSO teamwork effected rapid and safe recoveries with landing intervals measured in seconds. LSO's trained their own replacements by the master-apprentice method. The time required to train a new LSO as well as teach carrier landing techniques to the increasing numbers of new carrier pilots dictated that both areas of instruction should be accomplished with naval activities other than the operating forces.

With the outbreak of WW II, increase in the number of pilots in training, and the augmented aircraft pro-

duction and aircraft carrier construction indicated that large quantities of qualified LSO's had to be trained as quickly and as thoroughly as possible. Prospective LSO's were selected from returning combat carrier squadrons, directly from operational flight training and in some few instances, non-aviators.

During 1942, LSO training was accomplished within the Naval Air Training Command at each advanced training base. Upon completion of their field training, they received initial carrier qualification as LSO's under ATG-1 at Norfolk and operated aboard the CVE's *Card*, *Charger*, and *Core*. Once qualified and designated, the LSO's were ordered directly to carriers as members of ship's company in the Air Department.



JET AGE TRAINEES GETS MIRROR WORD FROM LCDR. STOLLENWERCK



CVG-4 LSO MONITORS RAG PILOT MIRROR PASS AND TOUCHDOWN



WW II LSO ED VOLTZ CUTS CAG-5 FLATLEY IN FIRST F6F TO LAND ON USS YORKTOWN

While this program produced many fine LSO's, it had one disadvantage. The basic LSO training was being undertaken at several different locations and afforded no assurance that rigid standards of performance and standardized fundamental training were being given.

Early in 1943 the first formal LSO training unit was established at NAS JACKSONVILLE and was designated T-4. The sole mission of this unit was to train prospective LSO's. Using the assigned aircraft, LSO trainees alternately flew FCLP and received direct supervised training on the platform. Upon successful completion of training at T-4, the new LSO's were ordered to operational training bases for additional field training under the guidance of qualified LSO's.

ATG-1 and the *Chesapeake Bay* carrier qualification operation were abandoned in favor of the establishment of CQTU-4 at NAS GLENVIEW with carrier qualification to be performed on the converted Great Lakes excursion ships, USS *Wolverine* (IX-64), and USS *Sable* (IX-81), operating in Lake Michigan. During the last half of WW II, virtually all new Naval Aviators and LSO's received their initial carrier experience on these two carriers.

In discussing the training given to new LSO's a great amount of the credit must be given to the skill and professional ability handed down from the "Old Masters" to their assistant LSO's. It would not be feasible to compile a complete listing of all of these LSO's. Many of our most senior

Naval Aviators, including the Chief of Naval Operations, Fleet Commanders, carrier division commanders, and commanding officers of carriers, have had extensive experience as Landing Signal Officers.

From the "Old Masters" to the WW II-vintage LSO's came many pearls of wisdom that are apropos today:

- There are six basic parts to a carrier pass: (1) Pattern, (2) Altitude Control, (3) Speed Control, (4) Attitude Control, (5) Lineup, and (6) Landing. Any time you sacrifice or omit one of these basic parts, the pass is less than satisfactory and a salvage operation faces the Pilot/LSO team.

- Debrief your pilots as a group rather than individually. The discussion of each error with the entire group has a positive effect on all pilots as well as the pilot that committed the error.

- Only through wide experience can an LSO develop the confidence required to perform satisfactorily and thereby transmit this confidence to his pilots. You can transmit any sign of lack of confidence or indecision through a set of flags as rapidly as you can by radio.

- Treat all pilots, regardless of rank, with exacting fairness, honesty, and courtesy without lowering the standards of performance demanded of all carrier pilots.

- Demand that every approach on the field or aboard ship represent the

maximum capability of the individual pilot concerned. Each pilot must be considered as an individual personality, each with varying limits of capability as a pilot. Therefore, the degree of effectiveness of the pilot/LSO team will depend greatly on the degree of judgment that the LSO employs to extract the required performance from the pilots under his guidance.

- Remember that perfection, while an admirable goal, is normally attained in degree only.

- In judging the speed of an approaching aircraft, learn to use the attitude, rate of closure, and sound of the amount of power being carried.

- Build yourself a mental fence behind the ship. If the pass is within limits, open the gate and let him aboard; if not, give him a waveoff. Any induced error committed inside the fence can have disastrous results.

- All LSO's must treat a newly assigned pilot as an unknown quantity until a solid foundation based on judgment, ability and capability between the pilot and LSO can be determined. There is no known shortcut in arriving at this determination. The last half of World War II, post WW II war years and the Korean conflict produced a brood of LSO's fondly referred to as "Rugged Individualists." These LSO's operated under the extreme pressure of combat, maximum tempo of operations and adverse day/night weather conditions. Squadron pilots and carrier personnel alike incurred their wrath whenever any deviation from professional performance interfered with the LSO's ability to recover his group safely.

Many a "critic" has been invited to take over the platform and recover the aircraft personally if he did not like the way it was being handled.

At the close of WW II, LSO training was moved into the Pensacola area with both basic and advanced carrier qualification training being accomplished aboard carriers operating from Pensacola. LSO training progressed along the same proved concepts handed down from the "Old Masters." Advent of sophisticated, jet-carrier operations, a more vigorous aviation safety program, a cost-conscious military establishment and major carrier conver-

sion programs led to many changes in the concept of carrier operations. In 1953, the formal LSO training program was discontinued.

In the mid-1950's, the angled-deck carrier and the optical landing systems introduced into the Fleet were expected to be the ultimate cure for pilot/LSO problems. Some experts contended that the requirement for qualified LSO's had passed and that the pilots should never be required to relinquish any control of their aircraft to a man outside the aircraft.

With the valve on the LSO pipeline safety-wired, transfers and normal attrition signalled a vanishing breed. The few remaining LSO's withstood such aliases as "Vice-President in charge of Kleenex and Windex," "Landing Safety Officer," and "Mirror Monitor." Accident statistics slowly and quietly dissipated these attitudes. The trend of carrier landing accidents shifted from the relatively simple barrier crash to the costly ramp accident. This led to a wild scramble in engineering and design studies to improve equipment and to provide back-up emergency equipment during the closing years of the '50s.

The handful of current LSO's had unceremoniously learned a great deal about their new problems. After working countless mirror approaches, their judgment and ability to evaluate the pilot's performance relative to position on the glide slope proved un-



PADDLE-WAVER PETERSON WATCHES FJ-1 AFTER FIRST JET LANDING ON BOXER IN 1948

canny. They learned to evaluate visually the accuracy of SPN-12 indications, acquired an appreciation for the limitations of optical landing systems and angle-of-attack indicators, and hammered for improved radio communications. Most important of all, the pilot/LSO team, while not infallible, provided a solid foundation for the safe and expeditious recovery of high performance aircraft, thereby protecting the combat capability of the aircraft carrier. The LSO's again hung their signs, "business as usual."

The establishment of replacement air groups under type commanders provided the logical training sites for an-

other generation of LSO's. During fiscal year 1959, both ComNavAirLant and ComNavAirPac established formal LSO training programs.

The type commanders' instructions were explicit:

"Train LSO's using the proven concepts handed down from the 'Old Masters' and the 'Rugged Individualists.' Stabilize the program by establishing a fixed length of tour as an LSO. If a prospective LSO falls short of desired standards of performance, terminate his LSO training at the earliest possible moment. Use any means available that will reduce aircraft accidents. Do not dilute the quality of Landing Signal Officers through over-production."

Adherence to these instructions has produced the present-day LSO who is well qualified, motivated and dedicated to this most challenging of jobs in carrier aviation.

The future offers many potential improvements in carrier operations, such as the "cross-light" optical landing system and the automatic landing device (SPN-10). Until such time as these products are proved infallible under all operating conditions, the LSO will conduct "business as usual."

The LSO story has no ending. So long as there is a requirement for manned aircraft and aircraft carriers, the pilot/LSO team will continue to form the backbone of carrier aviation.

"It is universally recognized that the most precise maneuver in all of aviation is an arrested landing aboard an aircraft carrier. . . ."



LSO, LT. W. J. HENDRICK, IS ON DUTY AS CVG-15 PILOT LANDS TBM ON USS ESSEX



PHANTOM II RECORD



NAA OFFICIAL STARTS BAROGRAPH FOR CONTINUOUS ALTITUDE RECORD



EDWARDS SPACE POSITIONING RADAR GAVE CONTINUOUS COACH



The F4H has become the 'one to beat' on the record ranges. It has held, holds, or has broken every 'world' record for speed and altitude. It also has established three 'world class' records.

World Records

- Over a straight course, 1606.324 mph (claimed), LCol. R.B. Robinson, 22 November 1961.
- Speed over closed circuit, 1390.21 mph, Cdr. John F. Davis, 25 September 1960.
- Altitude, 98,558 feet, Cdr. Lawrence E. Flint, 6 December 1959.
- Altitude in sustained horizontal flight, 66,443 feet (claimed), Cdr. George W. Ellis, 5 December 1961.

World Class Records

- Speed at restricted altitude, 902.768 mph, Lt. Hunt Hardisty, pilot, and Lt. Earl De Esch, RIO, 28 August 1961.
- The 500-kilometer closed course, 1216.78 mph, LCol. Thomas H. Miller, 5 September 1960.
- Speed, Los Angeles to New York, 2 hr., 48 mins., Lt. R.F. Gordon, pilot, and Ltjg. B.R. Young, Radar Intercept Officer, 24 May 1961.



'SKYBURNER' COMPLETES FIRST PASS AS GROUND OBSERVERS TRACK

FOR COL. ROBINSON'S OWN STORY OF RECORD FLIGHT, TURN THE PAGE

RIDING THE RANGE AT MACH 2.5

ALL WHO HAVE flown *Phantom II* have known she could break the 1525.96 mph world speed record held by Air Force F-106. However, with so many other important commitments—test programs, training, etc., of higher priority—it was not until this fall that a plane could be spared for the attempt.

McDonnell engineers and test pilots worked out the flight plan in detail. The goal was to work out a course and flight profile so that the plane would enter the straight-away headed for the starting gate at entry altitude with full internal fuel, high speed, and room to accelerate to top speed. Of course, it was impossible to have the best of all the variables; the idea was to get the best compromise.

The F4H used for the record attempt, named *Skyburner*, carried full internal fuel plus a centerline 600-gallon drop tank and two 370-gallon wing tanks at take-off.

Getting rid of those at exactly the right time, and in a safe place, was one of the big problems. There are only a few restricted areas where drops are allowed, and they are not ideally situated in relation to the record range.

FAI rules for the 15/25 kilometer speed record require some fairly precise flying. The contest aircraft has to hold altitude within 100 meters from the time it crosses the outer marker inbound until the finish gate, 20 miles one way and 17 miles the other on the Edwards AFB course.

Holding altitude within 100 meters was probably no trick back when the rules were laid down, but at 1650 mph, it is like holding a τ -28 to plus or minus 10 feet. The fact that the plane is accelerating all the way through the course doesn't make it any easier to keep on altitude. On the first pass, *Skyburner* was at 2.45 over the outer marker and had accelerated to 2.57 in the few seconds it took to reach the finish gate.

The rules require that acceleration to entry speed be done in level flight. If the contest aircraft ever exceeds 500 meters higher than the altitude it first enters the range, it will be disqualified.

On the morning of the record flight,



WORLD'S FASTEST—ROBINSON AND F4H

Skyburner was towed out to the take-off end of the runway in order to get airborne with every possible drop of fuel.

NAA stewards were waiting at the end of the runway to go through the required formalities. They sealed the fuel tanks—in order to be able to certify that the contest aircraft did not land and refuel during the attempt; started the barograph—the instrument for verifying flight altitudes throughout the flight; examined my FAI sporting license; and verified that the Robert Robinson on the license was indeed the pilot.

Certificates attesting completion of these procedures become part of the record "dossier" submitted to FAI in Paris to support the application for certifying the attempt as an official record.

With these formalities completed, I fired up, gave her the 100% check, released the brakes and the attempt was underway. After a burner take-off, the first part of the climb was made at 100%—all according to the carefully worked-out plan.

Take-off was made to the east, with climb-out to the south toward El

By **LCol. R. B. Robinson, USMC**

Centro. Over Salton Sea, I started an easy left turn back and dropped the empty centerline tank over the Chocolate Mountains gunnery range, altitude 33,000 feet.

I then lit the burner, accelerated to Mach 1.3, and continued climbing toward the north. Still right on plan, and on signal from Edwards space positioning radar, the two wing tanks—which had just gone empty—were dropped over Bristol Dry Lake range, 90 miles east of the starting gate, at entry altitude of 45,000 feet and Mach 1.3. It was full military power—100% and full burner—from that point to the finish gate on the first pass.

I let the nose drop to help build up speed. When air speed hit Mach 1.8, *Skyburner* was down to 41,000 feet, I eased her back up to altitude, still accelerating. All the while, space positioning radar was coaching on line-up to help put us straight down the middle of the two mile-wide record range.

Once across the finish line the plan called for coming out of burner and back to idle to slow down for the turn-back. A slight left turn put us south of the course, so that we would roll out of the turn on centerline for the second pass.

Abeam Point Mugu, speed had bled off to Mach .9, the speed for the turn, so I put on power and cruised on out to make the turn at 105 miles.

Coming back, without the problem of dropping the tanks, there was more room to accelerate. As a result, speed for the second run was at least 50 mph faster than the first go-through.

We had planned to try for the world record for altitude in sustained horizontal flight on Friday, 24 November, but weather forced us to delay the attempt. Cdr. George W. Ellis of Flight Test Division of NATC will set that record later. (Editorial note: Ellis set a mark of 66,443 feet 5 December to beat the official record of 55,300.9 feet.)

I was scheduled to fly the altitude attempt, but came east instead to be on hand for *Enterprise* commissioning ceremonies where the Secretary of the Navy, the Honorable John B. Connally, presented me with the DFC in recognition of *Phantom II*'s triumph.

NEW AVIATION SPECIALIST EMERGES



LTJG. BOBBIE R. YOUNG (R), WHO WAS RIO ON RECORD-BREAKING BENDIX TROPHY RUN, BRIEFS GLYNCO CIC GRADS AT MIRAMAR

WHEN THE NAVY decided to buy a two-place supersonic fighter called the F4H *Phantom II*, the added seat brought into being a career opportunity for a new breed of aviation specialists, skilled, ready and alert.

In effect, the F4H created a position calling for an aeronautical/electronics engineer who was physically and mentally capable of conducting his daily business at a "desk" that was hurtling through space at twice the speed of

sound. A new naval career opened.

The backseat specialist's membership on the *Phantom II* team depended upon his ability to free the pilot up front from all duties except the handling of the high-powered aircraft.



BLANDING, WEBSTER, WEISBERGER STUDY F4H HYDRAULIC SYSTEM



THREE RIO ENSIGNS STUDY RADAR TRAINER PANEL FOR PHANTOM

While Navy and Marine Aviators have been learning the art of carrier operations in the F4H, a group of second-seat specialists has been progressing through a highly technical program qualifying them as Naval Aviation Observers (Intercept). Pilots, Radar Intercept Officers (RIO's) and *Phantoms* will meet in Atlantic and Pacific Fleet squadrons in increasing numbers as F4H deliveries increase.

What sort of man is this "new breed" specialist?

Let's take, for example, the first three officers to graduate from the new Radar Intercept Operator course at the CIC School in Glynco, Georgia. Ensigns Richard L. Blanding, Charles

the subsequent stream of Glynco RIO graduates, take several refresher hops in the F3D and complete an intensive two-week Naval Air Mobile Trainer syllabus to familiarize them with the *Phantom II's* complex radar and weapons systems.

Each of the first Glynco RIO graduates has a history of intense and enduring interest in Naval aviation.

Blanding, a 1960 graduate of the University of Colorado, received his commission that spring under the NROTC program, after having performed previous summer training duty aboard USS *Perkins* (DDR 887) and USS *Wisconsin* (BB 64). He was named Outstanding Officer Student at

ground of naval service and a long-time interest in flying led me naturally into this field," he revealed.

Both Webster and Weisberger had sought to enter the navy pilot training program, but were disqualified by slightly sub-par depth perception.

Weisberger also gained his commission through the AOC program in September, 1960, after arriving at Pensacola from VF-121, NAS MIRAMAR, where he served from July 1959 to April 1960. A 1957 graduate of the University of Redlands, Calif., he participated in the Navy Reserve program from 1953 until his entrance on active duty in 1959.

"Since my father was a WW I Army



WEISBERGER GETS TORSO HARNESS ADJUSTED



NAVAL AIR MOBILE TRAINING DEVICE GIVES WEBSTER FEEL OF F4H OPERATIONS

I. Webster, III, and J. Harry Weisberger are the products of training programs as stiff and demanding as any given Naval Aviators. Each one of them is qualified as a naval officer to take his place as a skilled partner in the F4H *Phantom II* team.

These three ensigns today agree on one thing: "The F4H is probably the most effective weapon in the nation's air arsenal today." But this conclusion was made only after having been made fully ready for the RIO task.

At NAS MIRAMAR, where they were assigned after Glynco, there were certain preliminaries before their introduction to the *Phantom II*. Each of the ensigns had spent 80 hours in the F3D-2T at Glynco. Before stepping into the rear seat in the F4H, they, like

Pre-Flight School, NAS PENSACOLA.

"I've been interested in flying since I was six years old and wore my first 'pilot's suit,'" Blanding said. This early motivation led him to major in aeronautical engineering in college, following the precedent of his father, engineering manager for the Garrett Corporation's AiResearch Manufacturing Co., Phoenix, Arizona. In WW II, the elder Blanding held a position in Navy's BUAE.

Webster, a product of the Aviation Officer Candidate program, was commissioned upon graduation from Pre-Flight in September, 1960. He had received a B.A. degree from Hamilton College, N.Y., in June 1959, and was subsequently employed by Union Carbide Corporation. "A family back-

flier and a flight dental surgeon in the Pacific in 1942-43, aviation has always held my imagination," Weisberger said.

While based in Georgia, the three became private pilots and joint owners of a light, single engined Piper Super Cruiser, which they flew to California upon transfer.

Ensigns Blanding, Webster and Weisberger are tentatively slated to join the second deployable AirPac fleet F4H squadron, VF-142, which is preparing to make the switch from F8U *Crusaders* to F4H's under the guidance of VF-121 at Miramar.

The group now under training at Glynco ranges in background from ensigns a year out of college to veterans with WW II combat aircrew experi-



THEIR BACKS TO THE F3D, THE RIO'S NEAR THE GOAL TO WHICH THEY HAVE ASPIRED, REAR SEAT STATION IN THE PHANTOM II

ence. A number of Marines, many of them warrant officers, are included in the present student body.

VF-121, commanded by Cdr. M.M. Casey, Jr., was the first Navy squadron to receive the Mach 2 F4H-1 and previously trained all F4H RIO's in the squadron. In order to improve its training of Fleet Replacement pilots and RIO's and to insure that the RIO—officially Naval Air Observer (Intercept)—received the best possible basic training, VF-121 closed the doors on its basic NAO(I) school in June 1961. At that time, the Glynco school, which had been operating for several months, took over all basic intercept training for both East and West Coast squadrons.

Blanding, Weisberger and Webster, comprising the first class, completed the 10-week syllabus at Glynco in August 1961, after covering a trail leading back thru NAS PENSACOLA.

The three graduated from U.S. Naval School, Pre-Flight, Pensacola. They had received in Pre-Flight exactly the same instruction as the pilot trainees. Then followed eight weeks at the Naval Aviation Officer Basic School, Forrest Sherman Field, Pensacola, where they made their first flights as Technical Observers in the T-34, T-28, SNB, S2F and T2V aircraft. Extensive ground school courses included aerial navigation, air intelligence, electronics and today's special weapons.

Moving to NAS GLYNCO, at Brunswick, Ga., the prospective RIO's first attended the eight-week cornerstone CIC course, where they were presented the broad view of shipboard CIC operation, including antisubmarine warfare, anti-air warfare, warning electronic countermeasures, and shipboard air intercept control. This followed the month-long fleet Air Controller's course, where they were trained to direct airborne interceptors while monitoring a surface-based radar scope. During their in-flight intercept work in the F3D, the prospective Phantom II backseaters learned to direct air-to-air attacks using the APG-51C radar gear

currently found in the fleet's F3H-2 *Demcon*. The F4H utilizes the much improved, but operationally similar, APQ-72 radar.

In the F4H, the RIO will relieve the pilot of many duties, handling much of the in-flight communications and navigation. At Glynco, the first students logged several hours on cross-country navigational training flights in the F3D under both VFR and actual IFR conditions. They learned radar mapping, navigation and airborne CIC procedures during flights in the WV-2 *Super Constellation* to such destinations as San Juan, Puerto Rico and NAS NORTH ISLAND. A flight simulator trainer afforded the trainees additional hours of intercept practice. They also received intensive ground school lectures covering meteorology, communications, airways navigation, cruise control, electronic countermeasures, and airborne intercept tactics—a well-rounded syllabus.

In addition to the F3D refresher and the 80-flight hour F4H indoctrination, VF-121 training includes survival training at NAS NORTH ISLAND. Survival training phase actually takes place in the mountains and on the beaches near San Diego and includes escape and evasion training. During a portion of the period, the trainees will be "student prisoners" in a startlingly realistic "communist" prison compound, undergoing interrogation by "guards" well versed in Red methods.



BLANDING EMERGES FROM F4H-1 REAR SEAT

Weekend Warrior NEWS

From Helicopters to Jets

First Lt. Wayne Koons, USMCR, pilot of the helicopter that plucked Astronaut Cdr. Alan B. Shepard from the water after his historic flight last May, has joined Marine Air Reserve Attack Squadron 233, NARTU NORFOLK, and is making transition flights in jets. Lt. Koons, now employed as a civilian space technologist with NASA at Langley Field, Va., is working on the NASA *Apollo* project which aims to place three men in space. Interviewed during one of his weekend drills at NARTU NORFOLK, Koons said his selection as pick-up pilot was "just plain luck." But he added, "Of course, I was very happy to be selected."



MARYLAND GOV. Tawes presents Reserve Day Decree to Capt. Muery, NARTU Andrews.

Andrews NARTU Dedicated

NARTU, based at Andrews AFB, Maryland, was dedicated November 18, marking the start of a new phase in Naval Air Reserve in the Washington, D.C., area. The day was proclaimed by Maryland Governor J. Millard Tawes as "Naval Air Reserve Day" throughout the State. A plaque was unveiled dedicating the new unit "to those citizens of Maryland, Virginia and the District of Columbia who cherish freedom and liberty under God." More than 1200 reserves were on hand to mark the end of the unit's move from NAS ANACOSTIA.

People-to-People

Redwood trees and surgical instruments were among items airlifted to the Mediterranean Sea area by Naval

Air Reserve squadrons from Alameda and Willow Grove.

The Alameda transport squadron, VR-873, carried redwood trees to Morocco and avocado trees to Spain. More than a ton and a half of multi-purpose food supplement was delivered to Italy, Spain and Morocco.



MOROCCAN HOSPITAL aide accepts surgical supplies delivered by Willow Grove reserves.

Willow Grove's VR-934 carried two tons of surgical supplies, drugs, clothing, school supplies and vitamins to the Moroccan area as cargo on its trans-ocean training cruise. While in Morocco, operating with VR-24, the squadron added cash funds for education of a Moroccan student. The VR-24 wives organization has educational funds operating for four worthy students in the Kenitra area.

Dallas Runway Rework Begins

All jets landing at NAS DALLAS through the winter months will make Morest gear landings to effect safe



DALLAS JET TESTS new arrested landing device installed as safety measure while principal runway undergoes rebuilding this winter. All tailbook models will use the gear.



ALAMEDA'S AIRCREWMAN, Glenn Litteer, 56, Reservist of the Year, peers from P2V post.

stops while the station's 8000-foot runway is being rebuilt. The north-south runway is being "beefed up" to take heavier aircraft. Because only 6000 feet of runway will be available during the construction period, the station has installed arresting gear for hook-equipped aircraft.

Alameda Tops Recruiters

The Lockheed Trophy, given annually to the most improved recruiting unit in the Naval Air Reserve Training Command, was presented to NARTU ALAMEDA. Members of the NARTU Information and Recruiting Department, headed by Cdr. Robert Adams, were treated to three days of excitement, Hollywood style, as a reward for topping the 18-station command. Visits to film and TV studios, Disneyland, and the Lockheed plant were included on the special tour for the northern California recruiting team. Alameda is the third recipient of the Lockheed Trophy.

P3V'S NAVY FUTURE LEARNED

NAVYMEN, who will keep the *Orion* flying, made friends with Lockheed's new sub smasher, the P3V-1, at a recent two-week Maintenance and Engineering Inspection (MEI) at Lockheed-California factories.

BUWEPs experts from seven different stations attended the conference to familiarize themselves with all maintenance features of the 405-mph ASW aircraft. The fourth production plane and complete aircraft components were used to simulate actual service operations.

In addition to the MEI board and its advisors, nine separate working teams covered the P3V-1 from radome nose to wasp-like tail. They studied quality control, electrical instruments, electronics, powerplant/fuel/oil, airframe and utility systems, hydraulics and pneumatics, armament, safety and survival, and publications.

Largest group came from BUWEPs offices. Others represented facilities at San Diego, Norfolk, Patuxent River, Philadelphia, Key West, and Alameda.

The maintenance and engineering inspection is one of several builder-buyer get-togethers scheduled before the big four-engine plane begins official military missions.

A preliminary evaluation this month will give Navy pilots and flight engi-

neers an opportunity to check out the plane's combat flight characteristics. The *Orion* will receive its airborne equivalent of a shakedown cruise at Patuxent River between April 15 and June 15 when the Navy will fly six of the aircraft during a 60-day period. Approximately 90 Lockheed support people will be assigned to Patuxent for the trials.

In fleet service, the P3V-1 will be manned by a crew of 10. For that task, the ASW specialists will probe the seas with 2½ tons of the world's most advanced detection equipment. Once detected—and pinpointed—the foe will be subject to attack by nuclear depth charges, torpedoes and bombs, singly and in deadly armament mixes.

Orders for the P3V-1 assure production through 1963. First delivery of the planes is due in mid-1962.

Orion Put Through Speed Run

With virtually no help from tail winds, a Lockheed P3V-1 *Orion* sped from Burbank, Calif., to Norfolk, Va. 2540 miles—in just 5 hours, 44 minutes, Lockheed Aircraft reports.

Average speed for the transcontinental flight was 441 mph. Lockheed officials believe this to be the fastest west-east crossing of the nation by a four-engine prop-jet aircraft.

The P3V-1, forerunner of a fleet of antisubmarine warfare aircraft now in production at Lockheed-California Company factories for the U.S. Navy, landed with enough fuel to continue in the air several additional hours.

Lockheed Test Pilot John Christiansen said the flight was made at a 23,000-foot altitude.

Returning to Burbank, the big propeller-driven ASW plane averaged 412 mph against head winds. Elapsed flight time was 6 hours, 8 minutes.

Human Factors Study Starts FAA Analyzes Mid-Air Collisions

A human factors study designed to help avoid mid-air collisions has been initiated by the Sperry Gyroscope Co., Great Neck, N.Y., under a Federal Aviation Agency contract.

The intensive year-long study, to be conducted at FAA's National Aviation Facilities Experimental Center in Atlantic City, N.J., is aimed at determining a pilot's ability to detect a target and evaluate the threat, as well as testing his skill to choose the proper escape maneuver following a warning.

This will entail evaluation of pilots' reactions to different types of warning information, such as range and bearing of other aircraft in their vicinity.

Following completion within a few months of preliminary work on the collision-prevention program, six pilots are scheduled to take part in 24,000 simulated mid-air collisions in a special series of tests. In addition, 9600 tests divided among eight pilots will be run in an effort to find out how quickly a pilot can detect targets of varying size and contrast. To lend realism to the mid-air collision experiments, FAA is making available an aerial gunnery trainer and a flight simulator of the latest design.

A projection system, placed on top of the simulator, throws a small image of an intruder plane against a dome 10 feet away from the pilot. As the image appears in the distance, a controller warns the pilot through a headset in case he has not detected the target on the screen.

After observing targets that fly at them from various angles and speeds before suddenly disappearing, the pilots will report whether or not they were on a collision course. To prevent guessing, occasional sham trials will be run without projecting an image.



THE 10,000TH TEST shot on the TC-15 catapult was made 17 October at the Naval Air Test Facility (Ship Installations) at Lakehurst, N.J. The new steam catapult is now installed on the CVA-63, -64 and -65 and will be installed on the CVA-66. The test program of 2½ years corresponds to a five-year period of catapult operation under normal fleet use. The 10,000 test shots included more than 1000 live aircraft launches of such naval aircraft as the A3D, A4D, F4D and the F3H.



Farewell Salute to

NAS ANACOSTIA

By A. Willard Bellais, J02

THIS YEAR the runways of Anacostia give way to the freeways in order to speed District of Columbia traffic, and an historically important naval air station quietly slips into history.

Not the oldest naval air station, and certainly not among the largest, NAS ANACOSTIA nonetheless in 44 years of service to the Navy has witnessed many significant events, known more than a few of Aviation's greats, and had a real part in the progress of Naval Aviation.

Like many Americans who achieve greatness, NAS ANACOSTIA had a humble beginning. This air station's origin was the mud flats at the junction of the Anacostia and Potomac Rivers.

During World War I, the Navy Department needed an air station located on a waterway near Washington. Most likely location was the Anacostia Flats, a tract of land under the control of the Army by a "revocable license." Before the Navy could make any plans in relation to using it, permission to do so had to be obtained from the War Department.

First evidence of this negotiation was a letter of request, dated 25 September 1917, from the Secretary of the Navy to the Secretary of War. The response under date of 6 October 1917, couched in formal language, gave the required permission and the Navy then proceeded with early construction.

According to records, the first allocation of funds for construction amounted to \$500. With this, a wooden shack, a supply shack and a wooden hangar were started.

However, plans for improving facilities were expanded, and on 9 Feb-

ruary 1918, \$30,000 was allotted to NAS ANACOSTIA for buildings and equipment. Plans at that time included a barracks large enough to feed and house 100 men, two hangars, two runways and a small office building. Construction of a bomb shelter (magazine) was authorized two months later—4 April 1918. The barracks was completed and occupied on 9 September 1918. Previous to that the men were billeted at the Washington Navy Yard.

In January 1918, the Chief of Naval Operations outlined the missions of the station. It was to serve as a base from which short test flights would be made, provide a suitable place for housing and for minor repairs for seaplanes which were to be flown from NAS HAMPTON ROADS and Langley Field, Va., and afford opportunity for various Navy bureaus to send representatives to examine new types of seaplanes and become thoroughly familiar with the construction of seaplanes and the installation of instruments and accessories.

On 10 December 1918, Franklin D. Roosevelt, then Assistant Secretary of the Navy, wrote a letter to the Secretary of the Army, and expressed the Navy's desire to acquire additional land. "This Department," the SecNav wrote, "desires to make the present Naval Air Station located in the Anacostia Flats a permanent Naval Station. . . . The proper development of a permanent station at this place will require a small area of additional land lying to the westward."

On 13 September 1918, the station had a full complement—with Lt. W.E. Doherty, U.S. Naval Reserve Force,

in charge of seaplane operations. The embryonic naval air station was under the command of the Commandant of the Navy Yard (now known as the Naval Weapons Plant).

Formal commissioning as Naval Air Station, Anacostia, took place in January 1919, with Lt. Doherty commanding. At that time there were nine seaplanes attached to the station. Test operations in flight and ordnance had begun by May 1918. Growth of Anacostia may be gauged from the fact that in June 1945 there were 115 airplanes on the station which engaged in 1501 flights that month for a total of over 4000 hours in the air.

A pigeon school swung into operation 1 January 1919 at Anacostia. The school, under the Communications Department, started with a complement of 19 enlisted men. The 516 carrier pigeons represented the best breeds in Europe. In the years that followed, NAS ANACOSTIA became the pigeon-breeding center of all Naval Aviation.

The Aircraft Radio Laboratory moved to Anacostia in August 1919 and carried out experiments there until 1922 when it became the Naval Research Laboratory at Bellevue. During its time at Anacostia, several inventions in the field of radio engineering were perfected. Few people know that music was first broadcast successfully by radio from the transmitters at NAS ANACOSTIA in 1921.

In late 1923, a Quartermaster (Meteorology) was ordered from NAS PENSACOLA to Anacostia and assigned the task of training enlisted men in weather observation. The first class was started in April 1924. Training of personnel and the development of



aerological instruments were carried on in a small wooden shack until the school was transferred to NAS LAKEHURST in 1930.

On 11 March 1925, NAS ANACOSTIA reported arrangements were being made for daily weather flights at an altitude of 10,000 feet to obtain weather data and test upper-air sounding equipment. These flights commenced in mid-April, and the following February the schedule was extended to include Saturday, Sunday and holiday flights, with the altitude being increased to 15,000 feet.

AEROLOGY set up a flight-condition board in the Operations Office in the mid-Thirties. Weather forecasts and reports were available on a round-the-clock basis to any pilot who might need them. This operation was carried on in a small frame building until 1942 when a modern aerological unit became an integral part of the Operations Department.

Anacostia served as the center of flight test and evaluation from shortly after the end of WW I until well into 1943. There were few, if any, aspects of Naval Aviation development which did not have a connection with Anacostia. For example, Anacostia is seldom associated with the development of aircraft carriers and related shipboard landing and launching systems. However, in the fall of 1920 when the collier *Jupiter* was being converted to the Navy's first aircraft carrier, coal barge #302 was equipped with a "flying off platform," and used at Anacostia for experimental purposes.

A catapult was also mounted on the barge and used in tests which led to

the development of a suitable braking system for stopping a catapult car after the plane had taken to the air. This work was an important step in the development of the catapults placed in service in 1922 aboard battleships and the carrier *Langley*. At about this time, certain schemes for arresting gear were tested at Anacostia and used to stop an automobile which had been equipped with a hook as a first step towards determining their ability to arrest aircraft.

A list of aircraft which were test-flown at Anacostia would very nearly cover all types delivered to the Navy through WW II. Loening M-8's, for instance, were among the first Navy monoplanes procured for shipboard use. These were used experimentally at Anacostia in 1921 to test propellers, radiators and spark plugs in connection with the 300-hp Hispano-Suiza engine.

Another curiously interesting test was that of the XF8C-2, the first naval aircraft developed for divebombing with a 500-pound bomb. In late 1928, when the contractor's pilot was demonstrating this aircraft at Anacostia, he crashed it. The late Capt. J. E. Ostrander, Jr., recalled, "The airplane hit a house close to the field at Anacostia and went clear into the cellar. At that time, it was decided no more dive testing at Anacostia, as the house might just as well have been the White House!"

Indicative of the role of Anacostia in flight test of airplanes is a tabulation of ten models upon which reports were issued between 25 January and 15 August 1931. Of the ten reports issued, two were reports by the flight test section prepared simply as tech-

nical reports of the characteristics of certain aircraft; eight were Board of Inspection and Survey reports which also established the suitability of the aircraft for use by the Navy. The aircraft tested were the Boeing 218, O3U-1, O2C with modifications, P3M-1, O2C-1, RC-1, XSL-1, PK-1, F4B-2 and OL-9.

As radio came more and more into use on aircraft, another section of flight test was established for the development of radio installations and equipment. Later, owing to its increasing importance, a separate section, known as Radio Test, was set up.

The Ordnance Department was busily engaged in carrying out extensive experiments as early as 1918. Guns, ammunition, flares, float lights, etc., were tested at the air station until the Dahlgren Proving Ground was established in 1921.

On 25 November 1924, the dirigible ZR-3 was christened the *Los Angeles* at Anacostia by Mrs. Calvin Coolidge and commissioned by RAdm. B.F. Hutchinson, Commandant of the Washington Navy Yard. The ceremonies were attended by the President, SecNav, CNO, and many other high-ranking officials.

In January 1927, a very small and insignificant flight department came into existence. Known as the Operations Department, it was destined in later years to become the main purpose of NAS ANACOSTIA. Two Ford trimotor airplanes for the use of high ranking officials and about 10 service-type airplanes for the use of pilots attached to Navy bureaus were assigned to the station. As this department grew, it was combined with the



A 1919 PHOTOGRAPH shows an HS-2L seaplane being beached on the ramp at Naval Air Station, Anacostia. In the background is the War College at Fort McNair.

Engineering Department and called the Operations and Repair Department.

On 11 June 1927, Charles A. Lindbergh's trans-Atlantic plane, *The Spirit of St. Louis*, was received aboard the station in its crate from the USS *Memphis*. The plane, assembled and placed on a lighter anchored off Haines Point, remained on exhibit for a day and a half, and was then returned to the air station. Mr. Lindbergh flew the plane to Mitchel Field, accompanied by two planes, one piloted by the station's commanding officer, LCdr. H. C. Wick, the other by Capt. Street, U. S. Army Air Corps. Time of the flight was two hours, 55 minutes.

During the growth and development of NAS ANACOSTIA, Navy's use of the field and construction of buildings was limited by its joint use with the Army. However this was changed by Executive Order Number 7235, dated 26 October 1935, which directed the transfer of several air stations and fields between the Army and the Navy. By it, Bolling Field became Navy property, and the Army moved its facilities to the new Bolling Field, just south of the naval air station. On 20 November 1939, the old Bolling Field became the NAS ANACOSTIA, and the new tower on the top of the Administration Building went into

operation. New field and flying rules issued jointly by NAS ANACOSTIA and Bolling went into effect at once.

In 1941-43, new buildings mushroomed on the station. A new Operations Building was completed in 1942, and a new Radio Test building was erected. A new and larger hangar was built to provide not only increased shelter space for airplanes, but also office space for the Engineering Department. A concrete-and-steel warehouse was completed in 1943. When Radio Test moved to Patuxent River, that building became a modern BOQ.

During Anacostia's early days, the photography department was housed in a wooden building that still stands. Photography and aerology both utilized this building until 1942 when aerology moved into the new operations building, and photography moved into the new Photographic Science Laboratory, designated as the Naval Photographic Center (NPC) in 1947.



PIGEONS were an important Navy communications link before radio became reliable.

The stepped-up tempo in military and civilian air activity in the vicinity of Anacostia made it increasingly difficult to conduct flight tests Naval Aviation required. The station lacked the facilities to handle the type of work being done by many of its sections. This situation reached its cli-

max in the years immediately preceding WW II, and a more suitable location for an experimental station was essential. A site at Patuxent River, Md., was selected, and when that station went into operation in April 1943, several units—Flight and Radio Test, Aircraft Experimental Development squadrons—began transferring from Anacostia.

In July 1942, the Aviation Intelligence Branch of BUAER was the coordinating agency for handling captured enemy aircraft equipment then being delivered to the air station. When a Captured Equipment Section was established on 1 February 1943, its headquarters were set up at Naval Aircraft Factory, Philadelphia. This section, returning to NAS ANACOSTIA in September of the same year, was redesignated and officially established there by SecNav on 2 March 1944. It remained at Anacostia during the war, later receiving the designation of Technical Air Intelligence Center. This special intelligence activity was disestablished on 1 July 1946.

On the very same day, the Naval Air Reserve Training Unit was for-



THIS KEYSTONE XNK-1 trainer is being beached, after a flight test in June 1928.

mally activated, and for over 15 years has been an important center of Weekend Warrior activity in the Washington area. This carried on a tradition of reserve training, for through the Thirties, Anacostia was a Naval Air Reserve Base.

Although many Navy jet aircraft had landed at Anacostia, it was not until 1957 that the station received its first jet plane, the TV-2 trainer.

In 1957 also, the American Helicopter Association held its annual whirlybird show at the air station in May. Innovations in rotary wing and vertical lift devices were demonstrated to the public. The year 1957 also



THIS LOENING LS seaplane, similar to the M-8 series, was tested experimentally back in 1921.

brought the first battery for saluting ceremonies at Anacostia which were used to salute the visiting VIP's arriving in Washington aboard Naval Air transports as the guests of the President or the Secretary of the Navy.

Open house at the air station that year marked the first appearance of supersonic Navy and Marine jet aircraft aboard Anacostia. They were flown from NATC PATUXENT RIVER.

In April 1958, the announcement that sounded the closing of NAS ANACOSTIA was issued by the Department of Defense. Owing to congested air traffic at the Washington National

Aviators on active duty in the Washington, D.C., and Annapolis, Md., areas, VIP administrative flight operations, Naval and Marine Air Reserve Training Program and Presidential Unit operations at the heliport located at the Anacostia, D.C., site, and to support operations of those activities



A VIP was Will Rogers (left) accompanied by Asst. SecNav Ingalls and Capt. Frank Hawks.

and units designated by the Chief of Naval Operations."

A little over 2000 officers, men and Waves will be assigned NAF ANDREWS. This installation includes a NARTU hangar, an office and training building, and the Ops-Administration building, now almost completed. Marine Flight Section hangar and Wave enlisted barracks have been built at the Andrews site. A new two-building BOQ has been established.



THE LAST JET aircraft to leave Anacostia's runways on January 1961. The Douglas A4D Skyhawk had been in Washington to participate in Pres. Kennedy's Inauguration.



VICE PRESIDENT Lyndon Johnson, ready to depart from Anacostia on an official visit.

A Navy Convair made the last flight from NAS ANACOSTIA on 8 December. Capt. Heyer, commander of the new Naval Air Facility at Andrews, flew the plane.

To have shared 44 years of nearly 51 years of Naval Aviation has been the lot of Naval Air Station, Anacostia. This station has seen the great and the near-great, played a significant part in the development and experimentation so important to early aviation, and served as a base from which many world records were established. Anacostia concluded her days with great and many services to the Naval Air Reserve. Her flying days are over, but her history stands, a credit to the officers and men who have led and directed her forces.



LT. APOLLO SOUCEK (later RAdm.) set world altitude record in 4 June 1929 at 38,560 feet.

Airport, Bolling AF Base and NAS ANACOSTIA, DOD proposed the move of both NAS and the neighboring AF Base to nearby Andrews AF Base, with a target date of early 1962.

Late in the summer of 1958, all of Anacostia's TV-2 jet trainers were moved to Andrews with a small detachment of men. The establishment of this Andrews jet detachment marked the beginning of the eventual move of aviation operations from NAS ANACOSTIA.

The last jet flew out of Anacostia on 25 January 1961. It was an A4D Skyhawk sent to participate in the Presidential Inauguration.

Last commanding officer of the station is Capt. Frank D. Heyer, who relieved Capt. George F. Rice in September 1961.

The Supply Department moved to Naval Air Facility ANDREWS AFB, as the new station is named in September 1961. The big move was made in December, and the new station—commissioning is set for this month—is in full operation. Its mission will be the same as that of the NAS ANACOSTIA: "Maintain and operate facilities to support proficiency flying for Naval

VAH-5 WINS 9TH BOMBING DERBY



ARRAY OF TROPHIES is made by winners of competitions conducted during Annual Heavy Attack Wing One Bombing Derby at wing headquarters, NAS Sanford. Six of the major trophies are held by four-some from VAH-5, at right, top squadron for the ninth meet.

IN THE NINTH Annual Bombing Derby at NAS SANFORD, Fla., Heavy Attack Squadron Five (USS *Forrestal*) won undisputed first place with 2758 points out of a possible 3600. VAH-11 (USS *Franklin D. Roosevelt*) won the leading event in a run-off with VAH-3 (NAS SANFORD) and VAH-9 (USS *Saratoga*) won the Airmanship Award.

Cdr. L.H. Sette and his crew, Lt. A.P. Fennell, Jr., and H.B. Wangle, AT2, of VAH-3 won top honors with 637 points out of a possible 750.

Lt. Ray Murphy, VAH-5, flying an A3D *Skywarrior*, placed first in the Loft Bombing event and went on to win the Might-vs.-Mite loft bombing against the A3J piloted by Cdr. Mat-

tus, VAH-3, and the A4D piloted by Cdr. Ayers, CO, VA-36. The latter two took 2nd and 3rd places respectively. This was the first appearance of the A3J in derby championships.

The competition was witnessed by VAdm. Robert B. Pirie, DCNO(Air), VAdm. Frank O'Beirne, ComNavAirLant, VAdm. Edward N. Parker, Deputy Director Strategic Target Planning, Offutt AF Base, Neb., and Rear Admirals Joseph M. Carson, Frederick J. Brush, Rhodan Y. McElroy, Jr., Paul D. Stroop and Forsyth Massey.

Among the visiting Air Force and Army notables were MGen. K.K. Compton, USAF, SAC Offutt AF Base, and Col. C.B. Hines, USA, Strategic Target Planning, Offutt AF Base, plus

representatives of Douglas, North American and Norden Aircraft companies.

A quarterly Heavy Attack Wing One Bombing Derby was first established early in 1957 to stimulate interest and improve proficiency and combat readiness of all Hatwing-One.

In 1958, the advent of the level readiness system changed bombing derbies to an annual basis. In the Sixth Bombing competition, held in December of that year, Carrier Airmanship was included in the derby and won by VAH-11. The over-all competition was won by VAH-9.

In December of 1959, VAH-5 won the Seventh Bombing Derby, and in 1960 VAH-11 won the Eighth.



COMHATWING ONE, Captain Tully, background, witnesses awarding of Douglas Trophy by VAdm. Parker to VAH-5 C.O., Cdr. Farmer.



AWARDS PRESENTATION crowd stands to applaud winners as they step front and center to garner trophies at end of derby competition.

NAVY TO USE TWIN JET T3J IN TRAINING



'SABRELINER' AS IT WILL APPEAR IN NAVY MARKINGS WHEN DELIVERED AS T3J IN '63

PURCHASE of 10 T3J aircraft through the Air Force for the U.S. Navy is being arranged. The planes will be used for training pilot/RIO teams for the F4H and pilots for the single-place F8U-2NE all-weather fighter.

Similar to the Air Force T-39B Sabreliner radar/navigation trainer except for electronic equipment, the Navy model will be equipped with the APQ-94 system, the radar installed in the latest model of the F8U-2N.

In dimensions, the T3J will be very close to the familiar SNB with a four-foot shorter span and a half-inch greater length. Powered by two 3000-lb/thrust Pratt & Whitney J60-P-3 engines mounted aft on the fuselage, it will have a training endurance of 3.5 hours when fueled to its internal capacity of 1056 gallons.

The cabin is pressurized to maintain 8000-foot pressure altitude up to the plane's service ceiling of 45,000 feet. It is equipped with FAA certified anti-ice provisions, mechanical flight controls, internal auxiliary fuel tanks and self-sufficient starters.

The plane is designed to provide maximum training opportunity for all students carried on a training flight. The co-pilot's position is equipped to train either F8U-2NE pilots or the pilot or RIO member of the F4H team. In the cabin, there are two radar positions and a navigator training installation, plus a jump-seat for radar instructor.

Two pilot/RIO teams or three F8U-2NE pilots or three RIO's are carried on a normal training flight. Students not in active control of the aircraft or radar can practice scope interpretation or navigation while waiting their turn.

The manufacturer says that the Sabreliner series was designed to require a minimum of over-all maintenance man-hours, special skills, tools, ground support equipment and facilities and estimates it will take only 3.5 maintenance hours per flight hour for maintenance of all non-electronic equipment. All servicing can be done from ground level without the aid of workstands or ladders. Maintenance of navigation and communication equipment is simplified by shelf mounting in one compartment and modular design.

North American Aviation estimates it can be operated more economically than any current jet type in the Navy inventory.

The T3J should be well "de-bugged" by the time the Navy's 10 are delivered in 1963. To date the Air Force has placed firm orders for 94 aircraft of various models of the T-39 series.

Marine Unit Now on Duty MAG-31 Reactivated at Beaufort

New muscle was added to Marine Corps Aviation and the 2nd Marine Aircraft Wing when Marine Aircraft

Group 31 was reactivated at MCAS BEAUFORT, S.C., in November.

LCol. Howard L. Walter accepted command of the Group when he received the unit's colors from MGen. Richard C. Mangrum, CG of MAW-2.

MAG-31 was first commissioned in February 1943. From October 1943 to the end of World War II, units of MAG-31 served at Samoa, Funafuti, Tarawa, the Gilbert Islands, the Marshall Islands, and Okinawa. During the Okinawa campaign, units of MAG-31 compiled a total of 38,187 flight hours and destroyed 191 enemy aircraft.

MAG-31 was decommissioned in mid-1946. When the Korean conflict started, MAG-31 was reactivated and moved to Miami, Fla., remaining operational there until it was deactivated in August 1958.

'Name's the Same' in Flight Son Pilots Father in Skyraider



FOLSOM INTRODUCES FOLSOM TO THE ADS

A yellow sheet turned in by a member of VA-122, NAS MOFFET FIELD read:

Pilot: Clarence S. Folsom

Passenger: Clarence S. Folsom

No, it was not a mistake. The Folsom, listed as pilot was Clarence S. Folsom, Jr., Ltjg, USN, and the passenger was Chief Yeomen Clarence S. Folsom, Sr., USN, who is attached to the office of the Judge Advocate General, West Coast, at San Bruno.

Folsom, Sr., had flown with his son in light civilian aircraft, but never with him in a naval aircraft. Asked before the flight if he had any qualms about flying with his son, Chief Folsom replied, "None whatsoever."

Chief Folsom has been in the Navy 18 years. The younger Folsom enlisted in the Navy in 1954 and went on to flight training in 1957. He received his U.S. Navy wings of gold in 1959.



CATERPILLAR OPERATOR BEGINS CLEARING

SILVER SWORD SHOWS SPEED



DILLINGHAM BASE PROGRESS IN 13 DAYS

LARGEST OPERATION of its kind to be held on the island of Maui in the state of Hawaii since WW II, Exercise *Silver Sword*, employed 24 Navy ships, including those of Amphibious Squadron One of San Diego, 100 aircraft of MAG-13, and the crack air-ground forces of the Oahu-based 1st Marine Brigade. More than 10,000 sailors and Marines participated.

The exercise included the virtual building of a "forward area airbase," its infiltration by guerrillas and the interrogation of enemy "prisoners," plus of course, close air support and helicopter assault.

Advance units of Marine Air Base Squadron 13 (MABS-13) arrived at the prospective "forward area" field, Dillingham AF Base on the western end of Oahu, a scant four weeks before D-day. They were the first of a force which was sent to convert an old WW II airstrip into a base capable of supporting modern jet operations in just two weeks.

The advance party consisted of six heavy equipment operators, six drivers, five utilities men and one photog-

rapher. In three days, they had completed housing for 107 more members of the advanced echelon.

This second wave included Mostest operators, communications men, ordnancemen, crash crew, supply men, another photographer, and combat engineer "Pioneers." The building of the base began in earnest.

The main body of MABS-13, with heavy equipment, vehicles and supplies arrived at Dillingham just five days before the field was scheduled to become operational. Thirty-nine major projects had to be completed in those five days.

The jobs included installing a liquid oxygen plant, rigging an overpass for the tactical airfield fuel dispensing system lines, and building a high speed turn-up area to test jet engines.

Working hand-in-glove with MABS-13 camp builders was a Pioneer platoon Co. B., 3rd Battalion. This unit worked 24-hours a day to repair the long-neglected Dillingham airstrip.

Built during WW II, the airstrip was unable to hold the 26,000-pound, combat-loaded FSU *Crusader*. The Pioneers solved that problem by reinforcing parts of the airstrip with 3x12 wood planking and beach matting.

In repairing one part of the runway, the Pioneers used 150 tons of rock and 20 tons of asphalt.

When the job was completed, the statistics stood as follows:

Ninety-five general purpose and 200 pyramidal tents had been erected; 4600 feet of water pipe installed complete with 300 different types of fittings; 38,000 feet of electrical outlets; and 30 generators were operating on a 24-hour-a-day basis to provide the electrical power needed for the working and living comforts of Marine Air Group-13's personnel.

When VMA-214, VMF-232, H&MS-13 and the Group Headquarters section arrived at Dillingham, they found in addition to the above:

A one-day service laundry facility; enough showers to bathe 48 men at one time; a mess hall large enough to



MOBILE REFUELING UNIT IS BUILT TO HANDLE SIX PLANES AT ONCE



VMF-232 IS TAKING NO CHANCES AGAINST A GUERRILLA ATTACK

accommodate 560 men at one sitting; a refueling system that held 120,000 gallons of fuel and was capable of refueling an aircraft a minute, and many other service and recreational facilities.

MABS-13 and the Pioneers not only built a base, they acquired valuable experience as well. As LCol. D.D. Petty, Jr., CO of MABS-13, put it, "We now have the required services and experience needed by the squadron to build an air base for the MAG's deployment anywhere—any time."

Troop personnel and aircraft operated out of Dillingham as though the airstrip were a tactical airfield deployed in a forward battle area. The landing field was of the minimal type, just long enough to accommodate landings and take-offs of jet aircraft.



HMR-16 COPTER SPEEDS TO PICK-UP ZONE

Each landing used the Mostest arresting gear.

During Phase I, which ended D-10, the air group conducted a training problem involving guerrilla raids, sabotage and espionage. Harrassment was by a 55-man force employing guerrilla tactics.

Perimeter defense was the responsibility of a 200 man infantry unit.

Four hours after arrival of Group Headquarters personnel and six days after the launching of Phase I of the Navy-Marine Corps amphibious training exercise, a defecting "enemy" aircraft responded to a reward leaflet air-dropped over enemy territory.

The jet aircraft pilot, Navy Lt. Dan Robinson of NAS BARBER'S POINT, came to collect a "\$25,000" reward offered any aggressor pilot who de-

fecting himself and his aircraft to the friendly forces of "Blue Nation."

The "defection" was actually part of the training that MAG-13 Intelligence personnel received during this phase of the operation. It was designed to enhance the interrogators' ability in handling enemy prisoners.

After the group interrogator-translator team questioned the pilot, Lt. Robinson "told all," including the name of his commanding officer. At the end of the interrogation, he was allowed to return to his parent organization. Though the team proved itself successful, Lt. Robinson found the "reward" was contained in quotation marks in the official news release.

During Phase II of Exercise *Silver Sword*, the group provided air support



'ENEMY' PLANE WAS SURRENDERED WHEN POSTER OFFERED \$25,000 REWARD TO DEFECTOR

for the assault forces of the 1st Marine Brigade when they assaulted Maui beaches at one minute after midnight on D-day and during the maneuvers following the landing. The Brigade's air-might began returning to Kaneohe Bay on D+four.

Pilots of Marine Helicopter Transport Squadron 161 performed a helicopter vertical envelopment assault lift which has been billed as a "Pacific record."

In five hours and 28 minutes, ten helicopters of HMR-161 lifted 1009 members of the 3rd Battalion, 4th Marine Regiment to battle positions more than nine-and-a-half miles away in "enemy" territory.

In addition, the rugged "choppers" delivered a total of 26,000 pounds of external cargo—carried on slings be-

neath the aircraft—to the landing zone.

External cargo included mechanical mules; the Howtar (a 4.2-inch mortar on wheels); and thousands of pounds of heli-lifted supplies for the 3rd Battalion.

One officer, veteran of many vertical assault operations, called the performance by HMR-161 "par for the course." At no time was a helicopter on the ground for more than two minutes in the pick-up area at Maui's Kahului Airport, nor more than 20 seconds in the drop-off zone. The squadron maintained 100% availability throughout the entire heli-lift.

After 85 hours of battling the enemy, a torrential rain storm and rough terrain, the 1st Marine smashed

through to the final objective at 1422 D+three to rid "Blue Nation" of the last remaining "rebel" forces and officially bring to an end the tactical phase of Exercise *Silver Sword*.

The fleeing "enemy"—2nd Battalion 7th Marines from Camp Pendleton, Calif.—was driven from "Blue Nation" by a three-pronged attack that featured a massive drive by infantry battalions of the 4th Marine Regiment.

From the outset, the victorious 1st Marine Brigade encountered stiff resistance from the "aggressors."

MGen. R.G. Weede, Brigade Commander, called the exercise "most successful. Landing by both air and sea in total darkness is particularly difficult," he said, "and the inclement weather and rough terrain in the battle zone made it extremely tough."

TWO POLES SUPPORT NAVY MAN

A NAVY PHOTOGRAPHER working this Antarctic summer in Operation *Deep Freeze* is believed to be the first military man to set foot on both North and South Poles. If so, he is one of only two men known to have trod on both spots, though many have flown over both.

Donald F. Williams, PH1, reached his second objective in a VX-6 C-130 *Hercules* when it broke the isolation of South Pole Station on 28 October 1961. Also aboard was RAdm. David M. Tyree, USN, who heads the *Deep Freeze* operations.

In February 1960, Williams had reached the North Pole aboard the nuclear submarine *Sargo*. When it reached the Pole on the 19th, the submarine surfaced. Williams climbed topside and within minutes was off the vessel, camera in hand to record the bleak scene.

The first man known to stand at both poles is Dr. Albert P. Cray, Chief Scientist, Office of Antarctic Programs, National Science Foundations. Like Williams, Dr. Cray reached the North Pole before attaining the South. On 3 May 1952, he flew in an Air Force C-47 *Skytrain* from the T-3 floating ice island and landed on an ice floe near the North Pole. He got out of the plane, walked to the Pole, obtained gravity readings, seismic depth soundings, and ice thickness measurements. He then returned to T-3.

On 12 February 1961, Dr. Cray completed an over-snow traverse from McMurdo Sound in the Antarctic to the South Pole, conducting various scientific studies enroute.

Actually, Williams did not realize that he had accomplished a polar "first" until Adm. Tyree pointed it out to him during a later discussion at Pole Station. "I was momentarily surprised at the thought of being the first military man to do it," Williams said.

How do the Poles compare? "As far as I'm concerned," he answered, "the South Pole is a more bitter, forbidding area than the North. During our visit, it was 39° below zero, with strong winds and blowing snow—bitter and uncomfortable any way you look at it."

Though the *Sargo* broke through to the North Pole during the Arctic

winter, he pointed out, the weather that February day was relatively mild. "It was only 40 below zero," he said, "with no winds. It really wasn't too uncomfortable. But each Pole is bleak, desolate, and lonely."

Williams was assigned the South Pole visit to make a motion picture record of a ceremony commemorating the 50th anniversary of the attainment of the Pole by Capt. Robert Falcon Scott, RN. Adm. Tyree made a brief address during the ceremony. The sound film was then processed and distributed to American news media.

Dr. Cray is scheduled to return to the south polar areas this season, sailing Antarctic waters in the ice-strengthened MSTC ship USNS *Eltanin*, conducting a series of studies.

Plaque Given Ely's Town VIP's Attend Ceremony in Iowa

A bronze plaque has been presented to the citizens of Williamsburg, Iowa, in memory of Eugene B. Ely, famed civilian aviator.

The plaque, 18 inches wide and 24 inches long, was made by two sailors, Robert C. Stanley, molder first class, and Dale L. Coleman, patternmaker fireman, serving aboard the USS *Cadmus*, a repair ship.

Capt. N.C. Gillette, commanding officer of NAS NORFOLK, presented the plaque to Iowa Senator Jack R. Miller, who accepted it for the state of Iowa. Capt. Gillette and Senator Miller then presented the plaque to the Mayor of Williamsburg, Gus O'Donnell, before the citizens of Williamsburg assembled in the town

square. Mayor O'Donnell accepted the plaque on their behalf.

Congressman Fred Schwengel and members of the Ely family were honored guests.

Ely, a native son of Williamsburg, was the first aviator to land and take off from a U.S. Navy ship.

Commissarymen Privileged Independence Esteems Them Highly

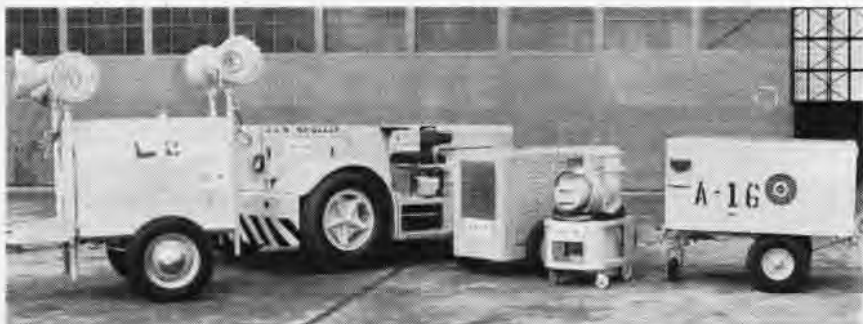
Ever heard of a "Laid-up Luau?" A practice known by that name is one of the reasons for the esteem enjoyed by commissarymen of USS *Independence*. The commissarymen are giving service-plus.

A program has been initiated aboard CVA-62 to elevate the unsung commissaryman to a position commensurate with his worth. The "Laid-Up Luau" is a festive repast provided sick bay patients in the best commissary bedside manner. In addition to routine 24-hour food service, on extra-heavy work days a "Sleep Walker's Special" is announced at 2100, and all hands are served sandwiches, hot dogs or hamburgers, with hot and cold beverages.

The "Messman of the Month" receives a merit certificate signed by the commanding officer, accompanied by a letter of commendation which becomes part of his permanent record; and a 72-hour pass or some other privilege, such as being flown to the beach for liberty while the ship is at sea.

A CSI reporting aboard may become "Chef of the Day," with a hand in planning the weekly menu and offering specials on his own, in addition to his regular duty as galley captain.

Independence believes extra time and effort in food service pays dividends.



WHEN SQUADRON RESPONSIBILITY is clear, it makes a difference. NAS Alameda found this out when it ordered I.D. tags for "yellow" equipment, so that the user is identified. Experience at Alameda has shown that clean, neatly painted equipment that is readily identifiable with the using activity, receives better care, less abuse and requires less "down" time for maintenance.

New Solar Radiation Data Scientists Use Aerobee-Hi Rockets

A Naval Research Laboratory rocket, fired at the White Sands, N.M., Missile Range at 0731, 29 August 1961, is giving scientists new information on the sun and its atmosphere.

The Navy *Aerobee-Hi* vehicle, soaring 118 miles into space, obtained photographs of the ultraviolet spectrum of the sun. Investigating solar radiation between the 2000 and 3000 Angstrom wave length, the NRL experiment represents the first time this portion of the spectrum has been successfully examined in detail. These photographs make possible a great advance toward understanding solar activity and its influence on the earth.

As the NRL rocket traveled upward, the *Aerobee-Hi* nose cone's pointing control system—developed by Ball Brothers Research Corporation of Boulder, Colo.—kept the sun's radiation directed into the spectograph. Photographs of the spectrum were made throughout the flight by the ultraviolet sensitive instrument.

As the rocket was pulled back to earth by gravity, the nose cone separated from the main section and parachuted to the ground.

The spectrograph used in the experiment was the same instrument recovered intact from a similar flight in 1960. That flight was unsuccessful owing to the failure of a critical component.

The *Aerobee-Hi* flight, directed by James D. Purcell of the Naval Research Laboratory in Washington, is expected to supplement the work of ground observatories in investigating the sun and interaction of solar radiation and the earth's atmosphere.



CDR. L. W. BROWN, JR., VS-33 C.O., receives AirPac VS Quarterly Safety Award from Cdr. P. H. Spears, VS-59 C.O. The award, the second consecutive one for VS-33, embarked on USS *Bennington*, is for first quarter, 1961.



COMMENCING with FY 62, the Alfred A. Cunningham Trophy, named for the first Marine Aviator, will be awarded the outstanding Marine pilot each year. The trophy was given by First Marine Force Veterans Association.

Tower Operators are Cited Two are Credited with 'Saves'

Just before lunch one day in November last, James Stacks, AC2, was on duty at South Whiting Tower at NAAS WHITING FIELD when he spotted three solo gunnery students entering the "break" for landing.

Controlling other traffic, Stacks kept the students within his line of vision. One of the cadets concentrated on making his final flight at Whiting a perfect one. He fell short of the goal, as witness this reported incident: The student followed established procedure but overlooked one part of the check-off list. As he reached the point of intended landing, Stacks broadcast a warning. "Studio," he radioed "your wheels are not down. Take a wave-off."

For Stacks, this was his fourth such "save" during his tour at Whiting.

Earlier that same week, in the North Whiting tower at the opposite end of the field, Earl C. Hendricks, AC3, observed a similar situation.

Following a different set of course rules, students are required to drop their landing gear over "Point Charlie," a spot in the entry channel about two miles from the field, but within sight of the tower.

Once again, the oversight was observed by the tower operator. The student was permitted to continue his entry into the field and he was

watched to see if he would remember to lower his wheels. As the plane passed the tower, Hendricks noticed that an instructor was riding in the back seat.

As the T-28 trainer hit the abeam position and started his approach turn, Hendricks broadcast his warning, averting another possible accident.

In recognition of their achievements, Cdr. M.F. Barfield, station executive officer, commented: "Duty in the tower often becomes dull, sometimes frustrating, and is always exacting. To Stacks and Hendricks go a hearty well done for performing their job with excellence. These men and air controlmen like them are helping to make flying at Whiting safe as any in the Navy."

Helicopter Names Assigned BuWeps Approves Popular Titles

Four operational Navy helicopters have been assigned popular names by the Chief of BUWEPs.

The single-engined HUS-1, used for Marine assault missions, has been assigned the name *Seaborse*. It has a seating capacity of 12 to 18 passengers, or a net payload of 4000 pounds for a distance of 100 miles.

The single-engine HSS-1 helicopter, capable of day or night flight under instrument flight conditions, is to be called *Seabat*.

HSS-2, Sikorsky's twin-turbined boat-hulled helicopter, will be called *Sea King*, a title appropriate to the world's largest amphibious helicopter.

HRB-1, an assault transport helicopter with all-weather and shipboard capabilities, has been assigned the name *Sea Knight*. It is to be used for a troop and cargo vehicle by the Marine Corps.



LT. ED GROUBY, VT-3's Aviation Safety Officer, laden down with recent squadron safety awards, passes on his job to Lt. Claude Fare who expresses bewilderment. VT-3 won the CNO Safety Award for four years in a row.

PRESIDENT APPROVES BEACON REPORT

THE PROJECT BEACON report on air traffic control has been accepted by President Kennedy, and he has asked FAA Administrator N.E. Halaby to carry out the report's recommendations for developing the national airways system of the future.

Project *Beacon* task force recommended both short and long range changes. Development of a sound and consistent system plan to guide over-all FAA efforts is a basic recommendation.

Civil flying is expected to increase 80% while military flying will decrease 36%, resulting in a net increase of 44% between 1960 and 1975. The share handled by the air traffic control system will increase 300 percent in the same period.

FAA and Department of Defense are moving toward a common system, operated by the FAA, to handle all civil and military flying. The report observed that the FAA must be careful to insure that essential military requirements be met in planning its control system of the future.

Use of parts of the nation's air defense system was explored by the Project *Beacon* group. It urged that the radar elements of the SAGE system be adapted for air traffic control.

The task force urges a variety of changes and new concepts to improve air traffic control over the next five years. Many changes in flight rules were proposed. Several of these changes would increase the percentage of flights under positive control. Other changes were designed to minimize collision hazard through such measures as establishing corridors in terminal areas and speed control regulations.

A new category of flight to be called Controlled Visual Rules (CVR) was proposed. CVR would permit pilots without full instrument flight ratings to fly in the air control system. They would fly with visual reference to the ground in clear weather as in present VFR flight, but would receive FAA control service to maintain separation from other traffic.

The report urged a control system completely independent of navigational information from pilots. Radar, including air defense radars, would supply most needed information when correlated with flight plans. Altitude information should be obtained from

beacons on aircraft transmitting their altitude for presentation on radarscopes.

Availability of this position and altitude information on the ground would sharply reduce the need for pilot reports. This in turn would reduce congestion on the radio frequencies used for pilot-controller messages.

Continued work was urged on all-weather landing systems to improve reliability of instrument landings under present minimums and to permit future operations in zero visibility.

The report noted a need for substantial improvement in the weather information available to civil pilots. It also said that the FAA should establish measures to monitor its efficiency and the quality of its service.

Stanford Scientist Honored Nobel Prize Winner ONR-Attached

Professor Robert Hofstadter, professor of physics at Stanford University and just announced as a sharer in the Nobel Prize in physics, since 1951 has been conducting the research which won him the award in a joint program supported at Stanford by the Navy, the Atomic Energy Commission, and

the Air Force's Office of Aerospace Research.

Construction at Stanford of the huge 300-foot long, high-energy linear accelerator, which provided the electrons for Professor Hofstadter's measurements of atomic nuclei and nucleons, was initiated in 1946 by the Office of Naval Research. ONR administers the continuing program.

Funds for the completion of the accelerator, which was for years the largest linear accelerator in the world, were also provided by the AEC and the Air Force's Office of Aerospace Research.

The fabrication of the apparatus devised by Professor Hofstadter to make his precise measurements was greatly simplified and considerably reduced in cost by the use of Navy surplus gun mounts as rotating platforms for the two large magnets which measure the energy of the electrons scattered by the nuclei. Rotating the magnets makes it possible to measure the scattered electrons at a wide variety of angles.

Professor Hofstadter's experiments have provided the first direct measurements of the size and structure of atomic nucleons (protons and neutrons) and have contributed substantially to a deeper understanding of the basic forces of nature.



FIGHTER SQUADRON 211'S Lt. J.E. Davis, at far right, is congratulated by his commanding officer, Cdr. H.R. Poorman, as a proud ordnance crew looks on. The photo, taken at NAAS Fallon, Nevada, highlights an F8U Crusader in which Lt. Davis is reported to have achieved a gunnery record. Firing at 20,000-foot gunnery competition exercise at Fallon, the young lieutenant pegged 34 hits out of 82 rounds for a single firing run percentage of 41.5.



CONVERSION OF THE ALBATROSS into an anti-submarine patrol plane for use by one of the NATO countries is the result of a cooperative venture entered upon by Grumman, the Air Force and the Navy. Using Navy and Grumman ASW know-how, the Air Force sponsored Grumman's latest development of the versatile Albatross. Basically an SA-16B (UF-2), new bumps and protrusions mark the ASW additions. NATC is testing the NATO version.

LEADERSHIP COURSE PAYS OFF

THE NAVY'S 30-hour leadership course at NAS NORTH ISLAND is yielding concrete results according to reports from that station.

Ten years ago the Navy recognized a growing problem: the large numbers of disciplinary cases, the lost time owing to absenteeism, and the large numbers of men who failed to re-enlist.

That trend is being reversed, and the Leadership Program is given credit.

One officer at NAS NORTH ISLAND said, "Civil arrests of military personnel in the local area for driving while intoxicated averaged 13 to 15 per month. The average has dropped to one per month."

Another report states: "One command reported a 22% reduction in minor disciplinary cases and 85% in court martials. Another command reported 30% increase in chapel attendance and a 59% decrease in highway accidents, an increase of 25% in recreational facilities. Minor disciplinary cases dropped from 33 to 3 per month in a year's time."

One petty officer said of the course: "It surely helped me. If 50% of the P.O.'s get as much out of it as I have, the Navy will be much better off."

The highly-regarded 30-hour, one-

week course at North Island is attended by petty officers representing all the squadrons and units based there.

Subjects covered include General Order Number-21; Code of Conduct; Military Position of the Petty Officer; Discipline; Human Relations; Principles and Techniques of leadership; Know Your Job; Communism; and Problem Solving.

Under Commander Utility Wing, Pacific Fleet, North Island's School is administratively controlled by Utility Squadron Three, Cdr. R. C. Downing, commanding officer.

Harmon Trophy is Awarded President Kennedy Honors Three

President Kennedy presented the Harmon International Trophy for Aviators to the 1961 winners at a ceremony in the White House 28 November.

For the first time in the history of the trophy, three pilots were named as joint winners of the Aviators' Trophy, awarded annually to "the world's outstanding pilot." They are: Scott Crossfield, former Navy pilot, now Development Engineer and Research Test Pilot of North American

Aviation, Inc.; Joseph A. Walker, Chief Engineering Test Pilot and a physicist with the National Aeronautics and Space Administration; and Major Robert M. White, Experimental Test Pilot, USAF.

The award winners were recognized for their outstanding accomplishments in flying the rocket-powered X-15 "research vehicle." It has exceeded Mach 6 (six times the speed of sound) or over 4000 miles an hour, inside the earth's gravity field, and soon is expected to carry man higher and faster than any existing "flight vehicles" built on airplane lines.

The X-15 was designed and developed by North American Aviation, Inc as a joint Air Force, Navy and NASA program. The X-15 is powered by an XLR-99 liquid-fueled rocket engine developed by Reaction Motors Division of Thiokol Chemical Corp.

Fifth BIMRAB Meet Held Fifty Technical Papers Presented

Fifth annual BIMRAB (BUWEPS Industry Material Reliability Advisory Board) meeting was held in Washington, D.C. Theme of the conference was "Implementing Reliability Control."

Over 300 industry and 175 military representatives attended. After a general meeting, the group divided into five sections to hear specialized papers. Over 50 papers were presented, each followed by discussions.

Printed copies of proceedings of the conference are available for issue to official libraries while the limited supply lasts. Requests should be forwarded to:

Secretary to BIMRAB (FQQE-1)
Bureau of Naval Weapons
Washington 25, D. C.

The next meeting will be held in Washington in November 1962. Early returns indicate a host of industry speakers of president-general manager level will attend. Mr. Dan Kimball, president of Aerojet General Corp. and former Secretary of the Navy; Sanford N. McDonnell, of McDonnell Aircraft; Stanley Hiller, of Hiller Aircraft; W.H. Yahn, President, Columbus Division of North American Aviation; H.L. Hoffman, President, Hoffman Electronics, and many others have accepted invitations to speak. Scheduled theme of the 1962 conference is "Industry Advises the Chief."

LETTERS

SIRS:

Attack Squadron 52 was distressed on receiving the October issue of NANews to discover that your page 2 article, "Battle E Squadrons Cited," made no mention of VA-52. I would like to point out that VA-52 was the recipient of the 1961 NavAirPac Battle Efficiency Pennant for AD squadrons and, in addition, runner-up for the 1961 CNO Safety Award.

At this writing, the squadron, commanded by Cdr. A. R. English, has been deployed to the Western Pacific aboard the USS *Ticonderoga* since 10 May 1961.

R. F. HANSON, LTJG
VA-52 Public Information Officer

SIRS:

The article in the October 1961 issue (p. 2) entitled, "Battle E Squadrons Cited" does not include Heavy Attack Squadron Six, the Pacific Fleet VAF pennant winner.

R. E. HERRICK, JR., CDR
Commanding Officer

NANews regrets that we did not receive general AirPac release on Battle E's and story was developed from local information which apparently was incomplete. Accept our belated congratulations.

SIRS:

In the past few weeks, we have read quite a few articles in various publications concerning so-called fast barrier rigging. The *Lake Champlain* has claimed a record at one minute and one second, thereby beating the *Yorktown*. *Kearsarge* claims a record at 56 seconds.

We of the V-2 Division in the USS *Hornet* have been reading these articles with interest.

We feel that we have been silent long enough, as we have rigged the barricade many times in less than one minute. Our best time was during a competitive exercise when we had it high and tight in 51.8 seconds.

Incidentally, the *Hornet* is now competing for its fifth consecutive Battle Efficiency Award, and the Air Department is shooting for its third "E" award in a row.

V-2 DIVISION
USS *Hornet* (CVS-12)

ABOUT OUR AUTHORS

Cdr. Paul M. Harbaugh (*Where Stands the LSO?* p. 16) is currently attached to the Staff of Commander Carrier Air Group 12 at NAS Miramar. In the billet of LSO Training Officer, he directs the NavAirPac LSO training program for attack carrier air groups.

He entered the Naval Aviation Cadet Program in Los Angeles, Calif., September 1942, and in July 1944, he was designated a Landing Signal Officer.

Cdr. Harbaugh's LSO duties have been performed on 33 different aircraft carriers, including the *Sable*, *Wolverine*, *Ranger* (CV-4), *Saratoga* (CV-3), CVE's, CVL's, CV's, CVS's, and CVA's. He states that his only claim to fame is that he was an LSO before he was old enough to vote.

LCol. Robert B. Robinson, USMC, (*Riding the Range at Mach 2.5*, p. 22), enlisted in the V-5 program in August 1942 and was commissioned Second Lieutenant, Marine Corps Reserve, December 1943, after completing the fighter syllabus.

World War II found him flying the F6F-5N on night heckler and night CAP missions from Okinawa.

Robinson has had his share of staff jobs as well as a wide variety of flying billets. He

has had tours operating from a CVE, flying in an F4U squadron, instructing in instruments in the SNB, plus squadron tours flying F9F-5 day fighters and F9F-8P's.

He was graduated from Naval Test Pilot School and served a tour at the Service Test Division, NATC PATUXENT RIVER, where he flew at least a dozen types including the F4H, F8U-2N, A3J, F11F, F3H, etc. His log shows over 5000 hours, including 1200 hours in jets.

LCol. Robinson served a split tour in Korea. He was a Forward Air Controller from the 1st Battalion, 1st Marines, and participated in the Inchon landing and the Chosen Reservoir campaign. He later flew close air support missions in the *Corsair*.

A. Willard Bellais, JO2 (*Farewell Salute to NAS Anacostia*, pp. 28-31), spent four weeks research digging into the history of Anacostia for *Airways*, the station's paper.

Bellais earlier made a "cold" impression on many readers when he filed an outstanding number of fine stories during his tour with Commander, U.S. Navy Support Force, Antarctica, in Operation *Deep Freeze 60*.

At the end of that successful assignment, he served briefly at U.S. Naval Communications Systems Headquarters in D.C. and reported to his present command January '60.

Of his Anacostia story, Bellais said: "Research was as interesting as it was irritating. The story had all of the elements, but unfortunately information was scattered or lost during a few periods of the station's history. Storms and fires destroyed records and it was only with the aid of patient people at BuPers and others in the area who were intimately familiar with details of the station's colorful past that the story was finally unfolded."



CDR. W. V. COLLINS, commanding officer of Patrol Squadron 23 and plane commander of Crew One, last May established a new endurance record, according to a recent announcement. The flight of 22 hours, 54 minutes, in a P2V-7 Neptune was made while on deployment at Argentia Naval Station, Newfoundland, and the occasion helped to



celebrate the 50th Anniversary of U.S. Naval Aviation. The flight according to Cdr. Collins, was a fine example of crew effort. The flight log showed the Neptune well ahead of the fuel curves in the aircraft handbook. At left, Capt. L.E. Harmon, Commander Early Warning Wings Atlantic, congratulates Cdr. Collins and his crew on record flight.



THE EYES OF ATLANTIC ATTACK CARRIERS



Call them what you will—'Willie Fox,' 'Flying Saucer' or 'Stoof with a Roof'—the WF-2 Tracers of Airborne Early Warning Squadron Twelve have become a familiar sight in the Atlantic Fleet. With over 600 officers and men assigned and led by its C.O., Cdr. K.L. Kier, VAW-12 provides detachments for every deployed Atlantic Fleet attack carrier. The squadron turned in the last of its venerable AD-5W's last August to concentrate on the WF-2. In earning their title of 'Eyes of the Fleet,' the 'Batmen' of VAW-12 have, since commissioning in 1948, operated the TBM, the entire series of AD 'guppies' and the WF-2 from more than 30 carriers.





COVERING NAVAL AIR

Naval Aviation News brought you under these 12 covers some 93,000 lines of copy and photos in 1961. A healthy portion of the Anniversary Year effort was given over to the good old days of Naval Aviation. We flew again with Ellyson, Towers, and other greats, and in one nostalgic sortie last August, watched the A-1 re-enact a memorable 'first.'

Most of this was made possible by our readers from the four corners who rifled cherished scrapbooks and dug deeply into memory files to furnish us with the makings. Editorially we turn away from the past now and head into '62 with this reminder: the story of Naval Aviation is yours for the telling. Send your stories to:

Naval Aviation News
Op. O5A5, Navy Dept.
Washington 25, D.C.