NAVAL AVIATION NEWS

RESTRICTED

Turboprop Engine
Airplane Storage
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RESTRICTED

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HIGH WINDS UP TO 130 MPH PLASTER ICE ON YANKEE NETWORK TOWER

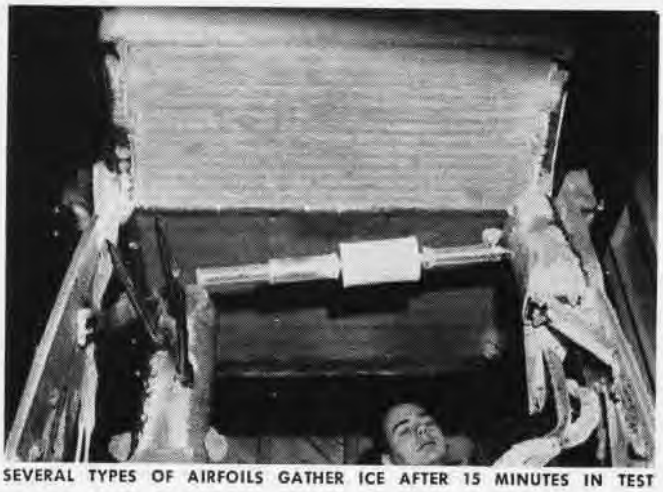
WORKERS AT SUMMIT PROJECT HOOF IT TO TOP OVER STEEP ICE SLOPES

JET ENGINES BY WESTINGHOUSE, ALLISON GETS TESTS IN PEAK HANGAR

MOUNTAIN PEAK JET ICING TEST IS RUGGED

A TOP WIND and snow-swept Mt. Washington in New Hampshire is a test hangar, lashed to the rocks by cables. Inside, for the past several years, the Navy and Air Force, together with private contractors, have been testing jet engine icing problems. The accompanying Air Force photos on this page give an idea of the rigorous job required to conduct the project during winter months when ice and subzero temperatures are standard.

All methods of travel from crampons to snow weasels and, in early fall, jeeps, are used to cart the heavy equipment and personnel up to the 6,300-foot summit. Since it is impossible to study icing on the intakes of jet engines while a plane is flying, artificial icing is produced in the hangar. Various engines and component parts undergo rigorous tests.



SEVERAL TYPES OF AIRFOILS GATHER ICE AFTER 15 MINUTES IN TEST

THOMAS A. DICKEY OF NAMC PHILADELPHIA (REAR) AT ENGINE PANEL

NAVY TURBOPROPS

When the Navy's XP5Y-1 patrol plane first lifted itself off San Diego Bay April 18 after a takeoff run of 20 seconds, its 30 min. in the air marked a triumph greater than the flight of a new plane.

It vindicated the Navy in keeping alive in America the turboprop engine, sometimes called the geared gas turbine or the propjet.

With a mighty roar, the four contra-rotating propellers, absorbing 22,000 horsepower, kicked up a spray and sang the song of aviation's neatest, smallest power package hitched to a propeller.

Specifically, the plane was designed to operate in forward areas, with an 11-man crew, from bays and lakes. Convair, with years of seaplane know-how through the P2Y, the PBY, and the PB2Y, combined all its talent in producing a radically-different seaplane.

This, plus the Allison XT-40-A-4 gas turbine, makes the plane the fastest of its type.

A cruiser bow, a V-shaped bottom, no keel and a length-beam ratio of 10 to 1 were fabricated to withstand high seas and rugged water conditions.

Hull characteristics were tested with one-tenth scale models which were catapulted hundreds of times. The hull is divided into 15 watertight compartments. Bulkheads extend to the floor only, leaving compartments unobstructed for the crew.

The 60-ton plane is capable of a speed in excess of 350 mph and can leave the water in less than 30 seconds. It can climb initially at 2,300 fpm. With one engine shut down the rate of climb is 1,400 fpm. Range is in excess of 3,000 miles. The power loading is greater than some modern fighters.

All compartments are sound-proofed for crew comfort, and bunks are provided for the crew when operating away from base for extended periods.

It carries heavy defensive armament. It also has search and countermeasures equipment in addition to ASW equipment. More mines and bombs by weight can be carried than a B-29.

A distinctive feature is the trim tab arrangement in the cockpit. On the pedestal between the pilot and copilot is a miniature plane. By moving it in the desired direction the control surfaces can be trimmed.

Now that the XP5Y has flown Cdr. Bob Thorburn and LCdr. Bill King, project officers during the 3½ years the plane was abuilding, can relax a little.

Now here is the story of Navy turboprops.

CONVAIR'S XP5Y-1 SITS IN DOCK, ITS FOUR TURBOPROP ENGINES STANDING BY WITH 22,000 HORSEPOWER TO LIFT IT OFF SAN DIEGO BAY

WITH THE development of turbojets before the war, it was soon obvious that these gas turbines could be geared so as to do work outside the turbine itself. Thus we find that the definition of a turboprop is an engine in which the turbine is geared to drive a propeller.

Contributions by the Navy in the development of turbine power were indirect during the war. It was aimed at directing the energies of development organizations to the types and sizes of engines which could be used in Navy aircraft. Results of these projects were furnished engine manufacturers.

A basic concept of Navy design was for a slim airplane where fighters and other carrier aircraft were concerned. Thus the axial flow compressor turboprop was a natural. This differed with British ideas which favored the centrifugal flow type of compressor with large diameter.

Not all development work is on the high power aircraft gas turbines. There is another application for this type power plant in furnishing auxiliary electric power in aircraft. The relatively high output for light weight makes it ideal for this purpose.

As early as 1939 the Navy considered that it had little tactical need for a pure jet because of the high power needed for carrier takeoffs and approaches for carrier landings. To take care of these deficiencies, however, the turboprop appeared to be the answer. Accordingly, Northrop was awarded a contract in 1941 to develop a geared gas turbine.

Previously the Navy had asked a committee on gas turbines of the National Academy of Sciences to make recommendations regarding the possibilities of using gas turbines in aircraft. The committee, whose main interest was shipboard gas turbines, said of the aircraft field that it would take 13 to 15 lbs. of weight per horsepower developed.

THE REPORT, signed by six nationally known scientists, went so far as to say, "The present internal combustion engine equipment used in airplanes weighs 1.1 pounds per horsepower, and to approach that figure with a gas turbine seems beyond the realm of possibility with existing materials." Shortly after this report it was found that turboprops would weigh on the order of ½ pound per horsepower, which is the case with engines operating today.

With the nation's effort being expended in fighting the war, the period 1941-45 produced few concrete results in the gas turbine program. It was necessary to supply already developed aircraft in great numbers and little of the engineering talent could be spared for new development work.

Northrop's project continued until June of 1945 when the Turbodyne which had been constructed was wrecked in a test run. The contract was terminated shortly thereafter, but Northrop continued in the field some time thereafter with an Air Force project, the pusher Turbodyne XT-37, which was dropped when that service decided not to install

AEROPRODUCTS CONTRA-ROTATING PROPS CAN ABSORB 5,500 H.P.

TWIN TURBINE EXHAUSTS GIVE IMPRESSION SOMETHING IS MISSING

turboprops in the Flying Northrop YB-49 Wing.

By 1943 the Navy was interested in getting design studies underway on geared gas turbines. A proposal was received from Westinghouse Electric and Manufacturing Company for a turbine driving a high speed contra-rotating propeller to be rated at 3,000 hp at sea level. A contract was let in March of 1944. Westinghouse pioneered axial flow turbines in this country starting in 1941. A completed engine first ran in May, 1943. Their turbojets now power the *Phantom* and *Banshee*.

ANOTHER OF the principal contractors who had undertaken design studies was Allison Division of General Motors Corporation. In November 1944, this company proposed a power plant of two units, mounted in parallel and driving a common reduction gear. What finally evolved was the present XT-40 engine, now powering the Convair XP5Y-1 flying boat. This combination delivers 5,500 equivalent horsepower at present. (Equivalent horsepower is the sum of shaft horsepower and jet thrust converted to horsepower.)

The XT-40 followed the Navy's philosophy of axial flow turbojets and turboprops whose capabilities for higher power are greater than the centrifugal flow engines. Most high power engines now being developed are axial flow.

It is interesting to note the comment of a ten-year history of aircraft power plants written by the Bureau of Aeronautics in 1945. It stated, "The Navy has long recognized that the propeller type gas turbine promises to be probably a more useful all round power plant than the simple turbojet, at least for the majority of naval aircraft applications. However, even the simplest propeller drive gas turbines are considerably more complicated and more difficult to develop. Thus the Navy has concentrated until recently its immediate developments on the turbojet engine. It is anticipated that all of the lessons learned in this development will be applied to the propeller gas turbine."

The Chrysler Corporation was in on early discussions regarding turboprops. Its proposal was unique in that the engine would use a regenerative cycle, heating compressor discharge air with exhaust gases. This would save fuel at military and cruise powers. Engine weight would be increased, however. Postwar cutbacks stopped this project.

An old reciprocating engine manufacturer, Pratt and Whitney, is also in the turbojet and turboprop field. The company recently announced a turbojet of 6,250 pounds thrust dry without afterburner, the J-48. It has also been developing a turboprop, started in 1945, which has run as a unit.

MANY DIFFERENT configurations remain to be explored in the geared turbine field. There is the regenerative cycle as previously mentioned. Then there is the free piston compressor gas turbine in which pistons not attached to a shaft operate compressors directly, their exhaust from both the burning and compressor sections feeding into a manifold where fuel is introduced.

This burned and greatly expanded mixture would be piped to and operate the turbine. Another reheat cycle arrangement would have a separate compressor-combustor-turbine feeding into a combustion chamber around a shaft, burning again and operating a turbine geared to a propeller.

Now that turboprops are coming into their own many questions are bound to be asked regarding their characteristics and what makes them tick. How do they operate? How do they compare with reciprocating and turbojet engines?

By definition the turboprop compresses air, mixes it with fuel, burns the mixture in a combustion chamber; then the

MEN PERCHED ON DOLLY DESIGNED FOR XP5Y-1 GIVE IDEA OF SIZE

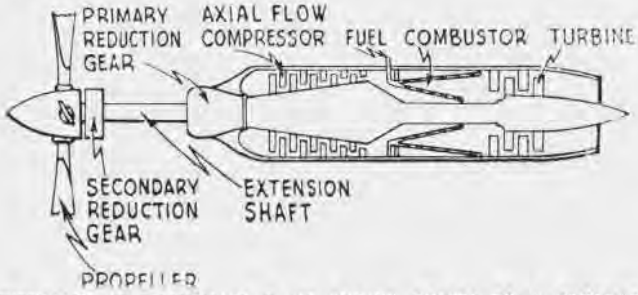
expanded gases go past turbine blades which in turn operate a propeller. Compared with the 1.1 pounds per horsepower of the reciprocating engine the turboprop's ½ pound per horsepower offers a great saving in weight. For instance, the XT-40 Allison engine develops 5,500 horsepower with a weight of a little over 2,500 pounds.

In fuel consumption, the turboprop at sea level uses .65 pound of fuel per horsepower per hour as compared with the .50 pounds of an R-2800 reciprocating engine operating at cruise conditions. Gas turbines operate at approximately 90% of normal rated power since maximum efficiency is obtained at takeoff powers. With increasing altitude, however, the reciprocating engine has to operate at increasing percentage of available power and thus becomes less efficient.

A turboprop affords a cleaner installation in the plane. Likewise it has no cooling problems at all altitudes. It needs no intercoolers as on a reciprocating engine employing blowers. The nacelle in which it is housed is pencil thin. This may save on structural weight, and is possible because the turboprop operates without vibration.

The XT-40 engine used in the XP5Y has a multiple stage compressor and a four stage turbine rotor. For easy inspection the upper halves of the housing are removable. There are provisions for de-icing around the air inlets. Accessories of the engine can be mounted in various locations depending on plane design.

The wedding of the XT-40 engine with the XP5Y represents a major step forward in aircraft and power plants. The turboprop promises to be the big plane propulsive system for some time to come while the new hull design of the XP5Y will enable it to operate under much more rugged conditions.



TURBOPROP IS ESSENTIALLY A JET ENGINE GEARED TO A PROPELLER

TWIN TURBOPROP ENGINES ARE GEARED TOGETHER TO MAKE XT-40-A-4A

THIS IS ARTIST'S IMPRESSION OF CONVAIR LINER WITH TURBOPROPS

CONVAIR XP-81, WORLD'S FIRST TURBOPROP PLANE, FLEW IN 1945

A TURBOJET has high power output at high speeds. It is ideal for fighter types, but is a hog on fuel. In contrast, the turboprop combines that power with fuel economy.

In a recent speech before the Institute of Aeronautical Sciences in New York, RAdm. C. M. Bolster, Assistant Chief of the Bureau of Aeronautics for Research told of new propeller possibilities in connection with turboprop engines. He stated that even at a mach number of .85 to 1.00 at 40,000 feet, the turboprop could compete with the turbojet if the propulsive efficiency of the propeller is equal to or greater than about 70%. He implied that such a propeller is possible and is being investigated by NACA, the Navy and the Air Force.

When cruising at lower speeds, in general, the propulsive efficiency of the turbojet decreases while that of the turboprop increases.

Adm. Bolster also mentioned the Navy's development of the six bladed dual rotation propellers and stated that an eight-blade propeller is in the making. "The Navy's great interest in complete exploration of the potentialities of the turbo-propeller combination, in addition to the hoped for fuel economies, stems naturally from our operating requirements—the high thrust necessary for seaplanes and carrier-based aircraft during takeoff, good low altitude performance and good overall performance at all operating altitudes," he said.

From the pilot's and engineer's standpoint, the operation of a turboprop is radically different. First of all, the engine runs at a nearly constant rpm. In the case of the XT-40, the engine rpm varies from 12,800 at idle to 14,300 at takeoff. Power to the propellers is varied through fuel flow. With a constant power output, the propellers vary their pitch with airspeed.

Here a natural question pops into the mind of the pilot who has operated reciprocating engines only. What becomes of the fuel burned at idle setting and the energy it represents? As in the turbojet, the power output can be controlled over a limited range, but at the minimum level it is still a substantial figure. How then can the rpm remain constant and the plane remain still on the ground or water? The answer is that some of the energy is represented in thrust, and to remain still the plane must actually be in reverse pitch. In flat pitch, there would be propulsion from the jet effect.

With a twin turboprop installation the pilot and engineer are protected from the results of operating a power plant which indicates damage. One unit can be shut down rather than operating it improperly. Simplicity of operation is fundamental. There are fewer controls than on reciprocating engines and fewer instruments for checking running conditions.

Both positive and negative thrust are available. This is accomplished by a single lever, avoiding the possible mistakes with a more complicated installation. Thus the trend is away from the gadget airplane, easing the pilot load.

IN THE case of XT-40 engine, initial studies for an engine in the 5,000 to 10,000-horsepower class indicated that a twin power unit would be the ideal design.

The major advantage of this arrangement is the flexibility it permits in cruise conditions. After takeoff, the turboprop plane with a full load can fly at one altitude and reduce its cruise power in one-eighth increments to a final value of one-half, in a four-engined ship. A turbojet, on the other hand, has to be flown at increasing altitudes as fuel and bomb load are used up.

Other advantages of a twin arrangement are that the component parts of the engine remain small, and failure of one unit does not result in complete failure of that engine. Auto-

NEW ALLISON TURBOPROP MADE ITS DEBUT AS FIFTH ENGINE IN B-17

BRITISH TURBOPROP PROGRESS IS REPRESENTED BY BRISTOL BRABAZON

matic declutching cuts out the failed unit. There is economy in testing in that less ram air is needed in running one unit. Then too, one unit is available as a separate, smaller power package for other installations. Starting equipment can be one-half as powerful.

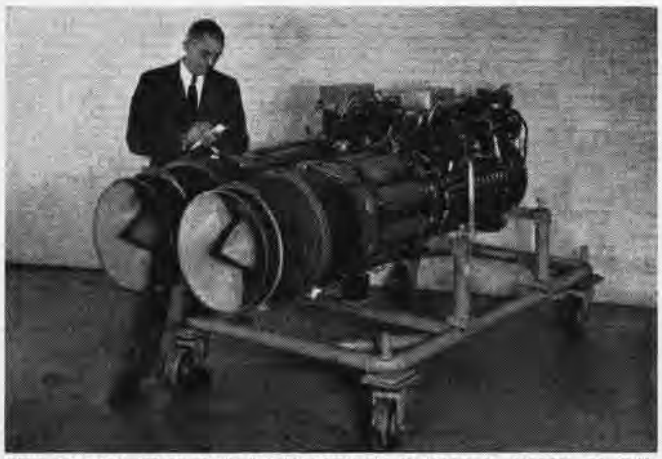
Continuing development on the XT-40 is aimed at increasing the horsepower available as was the case with many reciprocating engines.

Allison's development of the J-33 and J-35 turbojet engines led the way to the XT-40. Remote reduction gearing as used in the XT-40 is an offshoot of the arrangement used with the Allison V-1710 installation in the Bell P-39 and P-63 planes of World War II where the liquid cooled engine was behind the pilot and a long shaft ran to the propeller gear box.

While the Navy kept prop-turbines alive on this side of the Atlantic, the British have made many practical applications. The Bristol *Brabazon* is a transport which is to be powered by eight *Proteus* turbines coupled to four contra-rotating propellers. The upcoming *Princess* flying boat will have six sets of propellers powered by ten turbines. The Royal Navy has an ASW carrier plane, the Fairey 17, powered by twin coaxial turbines coupled to a propeller. The power plant is the Armstrong-Siddeley *Double Mamba.* Another large transport is the *Apollo,* carrying four single *Mambas.* The Vickers *Viscount* is another turboprop plane.

RYAN XF2R-1 WAS FIRST NAVY TURBOPROP PLANE: JET IN TAIL ALSO

Commercial application of the turbojet in this country has been slow. With the release of the XT-40, Allison has purchased a Convair liner in which to install the T-38, which is the single unit of the twin XT-40. It would provide 2,750 hp per nacelle. Also in the field is the pressurized Martin 404, 65 of which are being bought by TWA and Eastern Airlines. Scuttlebutt has it that the pressurized Douglas DC-6 could be converted as well as the Boeing *Stratocruiser* and the Lockheed *Constellation.*



NEW ALLISON XT-40 GETS CHECK-OVER BY RONALD M. HAZEN OF G.M.

The Navy's first turboprop plane was the XF2R-1, product of the Ryan company. This carrier fighter carried a General Electric TG-100 turboprop in its nose and a jet engine, the I-16, in the tail. When the Air Force dropped its support of the TG-100 program, the Navy never went into production.

An Air Force plane, the XP-81, similar in power plant design to the XF2R, was built by Convair, but was likewise discontinued. According to Convair, the XP-81 was the world's first to fly with a gas turbine engine designed for propeller drive. It flew in 1945.

Recent news reports stated that the Air Force now is interested in turboprops for its larger planes. They said that the B-36 may be converted to swept wings and turboprops as well as the *Flying Wing.*

Also mentioned for conversion to turboprops are the B-47 Boeing swept wing bomber and the B-52 reported to be in the mockup stage.

With never-ending zeal, the engineers of engine companies and the Bureau of Aeronautics are working toward a bright future for the turboprops, the smallest package of efficient propeller power yet developed for the airplane.

This program in the Navy is under the direction of RAdm. A. M. Pride, Chief of the Bureau of Aeronautics. In his power plant and research division are several men who have worked hard in keeping the program alive. In research work are Ivan H. Driggs, Fellow of the Institute of Aeronautical Sciences, and C. S. Fliedner, ranking civilian in the Power Plants division. Captain E. M. Condra is the chief of the Power Plants Division, while Cdr. F. K. Slason is head of the Experimental Engines Branch. Project engineer on the XT-40 is R. J. Maurer.

XP5Y-1, NAVY'S FIRST TURBOPROP SEAPLANE, MADE ITS FIRST TAXI RUNS IN SAN DIEGO BAY THE MIDDLE OF MARCH: THIS IS FIRST OF TWO PLANES

GRAMPAW PETTIBONE

"What's Wrong?"

The pilot of an Organized Reserve Squadron was all set to make his first flight in an FG-1D. He had slightly over 500 hours of total time and during the last three months alone had flown 57 hours. He had read and initialed all the safety directives and had been given a thorough cockpit check-out.

He taxied out, held near the runway end for a sufficient length of time to complete his engine run-up and cockpit check. Another *Corsair* had just taken off on the right side of the 400 foot wide runway, and after a normal interval this pilot started his take-off on the left side.

Shortly after the take-off roll started, the plane was observed to veer slightly to the left. Inspection of the runway showed that right brake was applied at this point.

The aircraft was airborne in a three point attitude after using about 800 feet of runway. It continued in a nose high attitude while commencing a left roll. The roll continued without hesitation until the plane struck the ground in an inverted attitude. The *Corsair* exploded and burned on impact. The pilot was killed instantly.

Investigators probing through the wreckage found the aileron trim tab fused in the 15-degree left wingdown position. The elevator trim tabs were found unburned and fixed in a 19 degree nose high position. Rudder and rudder tabs were destroyed beyond investigation.

Grampaw Pettibone says:

Here's a case where a pilot didn't even give himself a fighting chance.

Full left aileron tab, 19 degrees of up elevator tab! You can't help wondering what this pilot thought in the last few seconds of his life.

Whenever a fellow flys a plane for the first time, he wonders just how it will feel. How much rudder pressure will he need to compensate for torque? How much runway will he use? How will this plane compare with the one to which he had grown accustomed?

This lad was undoubtedly thinking about these things as he taxied out for take-off. But he had stacked all the cards against himself when he forgot to check his tabs.

Chances are that his last thought was simply "What's wrong?"

Let's Get Some Fish Scales

Two recent accidents point up the danger of overloading helicopters. Extreme care should be exercised during the loading operations of any single rotor helicopter. Pilots who have never flown an HO3S-1, for example, will be surprised to know that the allowable travel of the center of gravity is only about 3½ inches. If these limits are exceeded, longitudinal control is seriously reduced.

In one accident, the excuse for the overloaded condition was that no scales were available to weigh cargo items.

Grampaw Pettibone says:

I don't want to hear that excuse again. The folks in the Supply Corps tell me that they carry a standard stock item No. 18-S-1426, a fisherman type spring balance scale that is just the thing for weighing babies, fish, and small pieces of cargo.

If you rotor lads are going to operate in remote areas where there aren't any scales, for gosh sakes, draw one of these from Navy General Stores and carry it along with you.

How Cool Can We Be

Here's a welcome change from the daily routine of reading and writing about accidents—cause this one didn't happen:

"While piloting FG-1D from overhaul facility at NAS JACKSONVILLE to St. Louis, Mo., Lt. (jg) ———— USNR-O detected sparks and smoke in cockpit followed by droppage of right rudder pedal to the floor, leaving pilot with no right rudder or right brake.

This difficulty was encountered over the Okefenokee swamp, approximately 150 miles SE of his destination of Maxwell A.F.B. All indications of fire soon disappeared, so pilot decided to stay with the plane and proceed on to Maxwell Field.

"Due to distance and altitude, radio contact could not be made with Maxwell tower, but contact was made with an AF plane who relayed the position, ETA and request for a standby of all emergency equipment. Arriving over Maxwell Field pilot requested that a transcription be taken of all radio transmissions for future reference in case of damage to aircraft.

"Over the wingman's urgings to make a wheels-up landing, Lt. (jg) ———— elected to attempt a normal landing in an effort to save the aircraft from major damage. A bet of two dollars was then made by wingman that he would not succeed in a no damage landing. The bet was called.

"Owing to an overcast at 4500 feet, the pilot held that altitude and tested the plane for stability and controllability at landing speed with half flaps and wheels down. Complete landing check-off procedure was accomplished before the test was made. A test stall was not attempted as a recovery would have been doubtful without rudder control.

"It was observed that the plane could be held under sufficient control by employing the use of the rudder trim tab. Maxwell tower then gave pilot permission to land on runway 18, wind 170 degrees at 25 miles per hour, gusty to 30.

"Runway 14 was then requested by pilot so as to have a cross-wind from the right, which, once on the ground could be corrected for by the left rudder that he had available. Permission to use runway 14 was refused. The pilot then informed the tower that a landing on runway 18 would be attempted and must be completed on the first approach, and requested that all ground and air traffic be held clear of the area as a wave-off would be impossible owing to his inability to correct for torque.

"The approach was then started from an altitude of 2500 feet, straight in and five miles out. A rate of descent was set up that would bring plane over the end of the runway with a minimum of power changes that would effect the trim of the plane.

"The approach speed used was 110 knots, with 20 degrees flaps and prop set at 2200 RPM. This speed, flap and RPM setting did not require full rud-

der trim, thereby leaving some trim in reserve. On last mile of the approach full right rudder trim was rolled in but held off by pressure on the left rudder.

"A wheel landing was made at about 95 knots and the plane was held straight by releasing or adding left rudder. When the pressure on the left rudder was relaxed, the trim tab applied right rudder as needed, until the plane slowed down to a speed at which the tab was ineffective.

"The *Corsair* rolled to a stop after using about 3500 feet of a 7000 foot runway.

"The pilot then called the wingman who was still circling the field and told him to land and fork over $2.00.

"Inspection of the aircraft subsequent to the landing revealed that improper routing of the forward battery cable caused the right hand rudder cable to rub against it. This rubbing wore through the insulation and resulted in the rudder cable being burned in two as it contacted the battery cable."

Grampaw Pettibone says:

This is one of those times when I'm tempted to violate a long standing rule that no names are ever used in these pages, because I think this pilot deserves a lot of credit for clear thinking and coolness in an emergency.

Maybe he had his neck out a little in attempting a wheels-down landing with no right rudder or brake, but he had the situation doped out correctly and I think he deserves a rousing cheer in addition to the two dollars he won.

Ran Into Moving Prop

At the time of this accident the U.S.S. *Coral Sea* was at flight quarters engaged in recovering aircraft. An experienced plane captain was standing in company with two other flight deck crewmen awaiting the arrival of his assigned plane which, at that time, was making its final approach to a landing. Directly behind the men, another aircraft was being moved the last few feet to its parking spot.

After the cut, the landing aircraft hit the deck wheels first, bounced into the air and flew into the barrier. The crash alarm was sounded just before the plane hit the barrier, and the men scattered for cover. At this instant, the pilot of the aircraft being parked cut his engine by moving the mixture control to the *off* position, but the propeller was still whirling owing to inertia.

The plane captain dropped the tie-down lines he was holding and ran around the starboard side of the parked aircraft directly into the still whirling propeller. Death was instantaneous, caused by a compound fracture of the right side of the head. A Chief who also ran when the crash alarm was sounded barely missed the same fate. He ran around the starboard side of the same aircraft and crouched under the engine nacelle. He later stated that he was not aware of the turning prop until the plane captain who was running just behind him was hit.

Grampaw Pettibone says:

"Look Before You Leap" even in an emergency. During landing operations aboard a carrier, the best life insurance you can have is knowledge of where you're going to head in the event of a crash.

This means that you've got to be extremely alert. You've got to glance around and know what is going on behind you. If you plan to jump into a particular spot, take a look at it every once in a while to make sure that some spectators haven't blocked your escape path. In this sort of emergency, it is far safer to head for the catwalks than to run forward through parked aircraft.

Dear Grampaw Pettibone,

I thought that you might be interested in an experiment conducted by officers and men of VR-691 a short while back. In order to emphasize the importance of the station order concerning use of parachutes in military aircraft, a surprise unrehearsed drill was conducted. A crew of three plus 27 passengers, relatively experienced in flight safety because of the nature of their duties as flight engineers and orderlies, were ordered into a squadron R4D to simulate preparation for a routine flight.

When the men were all seated and had fastened their safety belts, the pilot announced, "This is a drill. The right wing is on fire. Put on your parachute and get out as quickly as possible. Get out." A stop watch kept an accurate record of the subsequent proceedings. The results of the first phase were as follows:

a. The first man emerged from the jump door in 2 minutes, 20 seconds.

b. Fifteen men were clear in 3 minutes, 20 seconds.

c. Twenty-six men were out in 4 minutes, 20 seconds.

d. One man never solved the intricacies of the harness and didn't get out.

The men were lined up and parachutes were inspected for proper fit; the following was noted:

a. Twelve men had parachutes on upside down.

b. Five men had harness on wrong side out.

c. There were several cases of harness buckles attached to wrong component.

d. Several harnesses were so loose that the men would have fallen out of the harness when the chute opened.

The second phase of the drill immediately followed the above and included proper instruction on the wearing and adjusting of the harness, and proper stowage of the chute pack under the seat. Again the signal was given to bail out and results were:

a. First man out in 8 seconds. ALL personnel clear of plane in 30 seconds.

b. Inspection of the men revealed all chutes correctly worn and adjusted properly.

The above was conducted under ideal conditions of no panic, no turbulence, and the plane was completely stable. It is estimated that to evacuate all personnel from the plane in the first phase of the experiment, the aircraft would have to be at the unattainable altitude of 50,000 feet. In the second case an ordinary flight altitude of 5000 feet would allow all personnel to clear the aircraft safely.

Grampaw Pettibone says:

Oh, brother! Imagine the panic that would have occurred if this bunch had been faced with a real emergency. Three or four years ago I wrote an account of an actual emergency in a Beechcraft in which the passengers got so confused and excited that they couldn't get into their chutes.

The pilot was having great difficulty controlling the SNB owing to terrific vibration, but was helped into his harness by a crew member. At about 1000 feet, he and the crewman were ready to jump, but none of the passengers had left the plane. The pilot was in a tough spot. The terrain below was not suitable for a forced landing, but he had no alternative. He and the crew member couldn't jump and leave three passengers to their fate.

He had to attempt a landing and found himself heading for a fairly steep hill. He dove the plane to pick up 100 knots, pulled back on the yoke, and tried to hit at about the same angle as the slope. Unfortunately, the SNB stalled just before impact and the deceleration tore all the seats in the passenger compartment loose and threw the passengers forward against the bulkhead. Two of the passengers and the crew member were killed.

About a year later when the pilot got out of the hospital, he dropped in to talk over the accident, and agreed that from then on he was never going to take it for granted that any passenger knew how to get into a harness or buckle on a chute.

AIR ARSENAL IN ARIZONA

THIS VIEW OF LITCHFIELD PARK AIR FACILITY SHOWS ROWS UPON ROWS OF STORED AIRCRAFT

IN A DUAL sense, Naval Air Facility, Litchfield Park, has its place in the sun. As the Navy's largest aircraft storage center, this area in Arizona which averages 84% sunshine and 68° winter temperatures, gives to aircraft the warm, dry protection they need.

With the lowest humidity reported in the United States, 42%, and an annual rainfall of only 7.74 inches, it is the ideal resort for reserve aircraft which may have to fly again. Located some 18 miles southwest of Phoenix, the facility is reached by U. S. Highway 80 and lies near the main line of the Southern Pacific Railroad.

Veritable "acres of diamonds," Litchfield Park facility represents billions of taxpayers' dollars. Here on 500 acres, the Bureau of Aeronautics Aircraft Storage Program presents a panorama of power with its thousands of planes, our War Ready Reserve!

Right after the war, NAF LITCHFIELD PARK barely escaped extinction at the hands of that well known grim reaper in budgetary circles, *Economy*. In search of low-priced storage, officials gave first consideration to the LTA hangars at South Weymouth, Weeksville, Glynco, Houma, Tillamook and Santa Ana. But the combination of high humidity and salt air was the wrong thing for inactive aircraft, and one by one these facilities closed and sent their aircraft to the protective custody of Litchfield Park.

HERE AIRCRAFT ARE SILHOUETTES OF POWER

Now the economy which threatened its existence has compounded the facility into such an investment that the most eager hatchet man inspecting the military budget would recognize it as a "must" for our national security. To the sentimentalist depressed by thousands of aircraft grounded, the inactivity of Litchfield Park may suggest a graveyard. To the realist, it is a reserve bank, representing tremendous resources piled up against an emergency.

The idea that these planes did their part and are now retired with no future usefulness is so wide of the mark as to be untrue. A few types may finally come to the end of their careers in a few years, but by and large there is sound basis for the Aircraft Storage Program. In an emergency, these aircraft are money in the bank.

One of the primary responsibilities of the Navy is anti-submarine warfare. Thousands of the planes at Litchfield Park are almost as useful as any others that could possibly be produced in defense against submarines, since they lack only certain equipment, a lack that could be quickly overcome if the necessity arose. Likewise, in the pursuit of offensive submarine warfare, these aircraft would be effective for mine-laying operations and pinpoint bombing of submarine pens and yards. Any enemy would find them far from obsolete.

The same is true of transport aircraft now in residence at Litchfield Park. In an emergency, the Navy would require thousands of airborne transports. To replace a given number of our stored transports with up-to-date transports would cost the taxpayers approximately 60 million dollars. Just to modernize these stored aircraft would cost 20 million. But from the military logistic standpoint, as long as these stored transport airplanes can fly and carry a load, they may still be useful many years from now. The "Air Arsenal" at Litchfield Park represents a potential that is well worth hoarding. The importance of this facility would be hard to overemphasize.

THERE need be no fears about the fate of our aircraft in storage. Every precaution is taken to make sure that they are actually ready for duty. The planes are now on the ground, but the excellence of storage and maintenance would permit, if the need arose, their induction into immediate combat duty without further changes.

This degree of readiness is a sustaining factor in maintaining the potential strength of the naval aeronautical organization. Behind every plane in active status are scores of others in the War Ready Reserve.

This high order of readiness depends upon the efficiency of outdoor storage which has in recent years gained acceptance. Previously it was only tolerated because the development of materials, processes and equipment left much to be desired. But the spur of economy cuts in the defense budget which would cut the strength of naval aviation at the very time of increasing belligerence abroad made it necessary to resort to storage rather than scrap aircraft surplus. Inevitably the storage program at Litchfield Park came into prominence.

Aircraft preservation at Litchfield Park falls into three categories: original preservation, desert maintenance, and annual preservation.

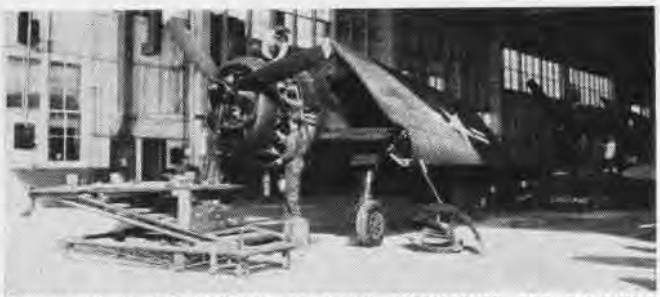
Original preservation consists of processing the airframe, power plants and accessories for extended storage. Present methods are a compromise which takes into account General Engine Bulletin

CDR. 'RED' GILL COMMANDS THE AIR ARSENAL

HUNDREDS OF PRIVATEERS SEEM TO EXTEND INTO THE FAR HORIZON

THESE EVER FAITHFUL 'TURKEYS' WAIT THEIR TURN FOR FURTHER USE

CREW IS PREPARING TO SPRAY PROTECTIVE COAT ON THESE BEARCATS



THE F6F IS IN THE PROCESS OF BEING DEPRESERVED FOR FLY-AWAY

38, NavAer 00-85A-501 and other directives which have been written, to fill specific needs at Litchfield Park.

During the original preservation of newly-received aircraft, all fuel cells are drained and oil-sprayed. Perishable and pilferable items—clocks, life rafts, first aid kits, batteries, etc.—are removed for inside storage. Radio and radar equipment as well as the pilot's control boxes, switches, and movable controls are covered with suitable materials to protect them against the ever-present heat and dust. Temperatures of as high as 120° F. are common in the cabins and fuselages of stored aircraft, and there are several highs of 150° F. on record.

Fabric-covered surfaces, which were formerly removed prior to desert storage, are now being processed with the aircraft. These surfaces are covered with a flexible protective blanket. Applied with a spray gun, this material forms a thick elastic cover which can be quickly stripped to ready the aircraft for flight.

Pilot's canopies, gun turrets, windows, etc. are covered with light reflecting materials to deflect the sunlight. These coverings are well secured since prolonged chafing would destroy the optical value of the plastic.

Finally, the aircraft is towed to the storage area to be moored. Tire covers are installed, and the shock struts are given a touch-up with protective grease.

Desert maintenance is a never-ending quest for minor discrepancies which must be eliminated. Dehydrating plugs are changed; tires and struts, inflated; loose or missing covers, replaced; and moorlines, checked. There is, in addition, a quarterly maintenance check of each aircraft. As part of this check, all cylinders are given a hot oil spray, and the oil level in the carburetor fuel chambers is replenished, if needed.

Experience is proving that an annual hot-run, supplemented by the quarterly maintenance checks, is sufficient to avoid corrosion of power plants at Litchfield Park, but it is doubtful if this period would apply at any location with higher average humidity conditions.

Annual represervation consists of depreserving the power-plant, and such controls as are needed for its operation. After the engines have been operated, they are returned to a state of extended preservation.

During the annual represervation period, all discrepancies of a major character are corrected to enhance the "combat ready" configuration. The Bureau of Aeronautics consistently schedules these aircraft to major O&R activities for modification to keep them from becoming obsolete.

Current planning will ultimately make it possible to classify all aircraft at Litchfield Park as "combat ready." The entire plan is a form of insurance against enemy aggression. If it becomes necessary to mobilize swiftly, its value will prove inestimable. Every kind of aircraft will be needed; every kind will be ready.

The unfailing hard work of Navy men and civilian maintenance personnel makes this reserve bank of flying might a real asset. Howard B. Lee, chief civilian supervisor, who has served seven years of regular and 17 years reserve duty with the Navy, is, next to the weather, the facility's greatest asset.

As "Air Arsenal of the Fleet," the Litchfield Park facility stands ready to deliver the goods at once.

SUPERSTITION MOUNTAINS, WHERE GOLD REPUTEDLY LIES, SURROUNDS PARKED AIRCRAFT WHICH REPRESENTS BILLIONS OF TAXPAYERS' DOLLARS

POWER CANOPY MURDER CASE

AT 1310 an aviation electronics man left the line shack to check the radar on an AD-1. A few minutes later an electronics technician hopped in a passing jeep to go out to the plane and give him a hand with the job.

As the jeep pulled alongside the AD-1 at approximately 1320, ————, AL3, was observed to be dangling from the right cockpit. He was pinned between the canopy and the windshield with his right arm outside the cockpit. His head which was facing forward and his left arm, to his shoulder, were inside the cockpit. The canopy was open approximately eight inches. ————'s feet were about four inches from the wing.

The canopy pressure was released and the injured man was lowered to the ground. He was unconscious, and his face was observed to be purple. Artificial respiration was commenced immediately and the dispensary was notified to send an ambulance to the scene of the accident.

At 1335, ———— was transferred to the dispensary and artificial respiration including a resuscitator with oxygen was continued for more than an hour. During this period stimulants including adrenalin and coramine were administered. At 1500 the doctors in attendance diagnosed that death had occurred at about 1330.

Inasmuch as the man who was killed was alone at the time of the accident, it is impossible to know the exact sequence of events which led to his being crushed. However, it is possible to arrive at some conclusions on the basis of these facts which are known:

(*a*) The canopy enclosure control inside the cockpit was in the closed position after the accident.

(*b*) The pressure remaining in the hydraulic system was sufficient to close the canopy. (The system has an accumulator which builds up a maximum of 3000 lbs. pressure.)

The first possibility, and perhaps the most likely, is that the AD-1 was secured with the canopy in the OPEN position. Nothing was done to dissipate the pressure remaining in the hydraulic system accumulator. The electronics man, in this case, must have moved the enclosure control from either the NEUTRAL or OPEN to the CLOSED position. He could have done this intentionally with the idea of getting out of the way before it closed, or he could have accidentally moved the control. In either case, he failed to get entirely clear of the cockpit and was strangled.

The second possibility is that the canopy was closed when he arrived at the plane. If this is true, the enclosure control must have been in the CLOSED or NEUTRAL position; otherwise the same pressure which subsequently crushed him would have opened the canopy. With pressure on the system, he could have opened the canopy by pulling the external enclosure by-pass control and sliding the canopy open manually.

However, this control is spring loaded and the canopy would have started to close as soon as he let go of it, unless, of course, the control in the cockpit was in the neutral position. In the latter case the circumstances would be the same as existed when the canopy was left open, except that some of the pressure in the accumulator would have been dissipated during two movements of the canopy.

With the above facts in mind, it is evident that this man met his death in one of three ways:

1. He found the canopy open, completed his work, or for some reason decided to close it by moving the enclosure control inside the cockpit to the closed position. The canopy takes several seconds to close, but he did not get clear.

2. He found the canopy closed, opened it by pulling the external by-pass valve, noticed that it immediately started to close again, and attempted to reach across the cockpit and turn the enclosure to OPEN. He didn't make it.

3. The canopy control was originally in the neutral position. While standing on the right wing of the plane and leaning into the cockpit, he accidentally moved the canopy enclosure control (located on the opposite side of the aircraft) to the closed position.

Regardless of which possibility you think most likely, the safety lesson should be very clear. Before securing an aircraft with a hydraulically-operated canopy, all pressure in the hydraulic system should be dissipated. After cutting the the engine this can be accomplished easily by moving the flaps up and down, or moving the canopy back and forth, or holding the by-pass valve open until the pressure drops.

JETS 'LAND ON' AT NIGHT

CAG-5, San Diego—There are few times in a naval officer's career when the opportunity arises to contribute a "First" to the annals of naval aviation. But eight pilots from Carrier Air Group 5 aboard the *Valley Forge* had that rare chance off the coast of southern California and all came through with flying colors.

Led by Cdr. Harvey P. Lanham, Air Group commander, the pilots from VF-51 and VF-52 completed successfully the first carrier landings at night accomplished by jet aircraft, specifically F9F's.

The event marked a climactic answer to skeptics who scoffed at the idea of jet fighters ever being practical aboard a carrier. In earlier trials, jets have proven they can be operated from a carrier in conjunction with conventional propeller-driven aircraft, that they are superior to other types in combat, that they are able to make strikes at distances equal to those made by other types, and that shipboard operating efficiency is not lost when jets are aboard.

Many phases of tactical doctrine and operating technique are still in the process of being worked out, but the question as to the suitability of the jet aircraft as a "round-the-clock" fighter needed an answer. Preparation for qualifying the eight pilots got underway with two night familiarization flights for each pilot and an average of 25 field carrier landing practice passes per pilot.

By experience, it was found that control of the approach speed and getting lined up with the carrier deck was almost entirely up to the pilot of the aircraft. These two assumptions were based on the fact that the attitude in flight of the jets was not exactly indicative of the airspeed, so the landing signal officer had no accurate reference by which to judge speed, and the fact that the pilots were so close in to the ramp by the time they were able to see the LSO's signals that the slant signals given them were too late to be effective.

TIME EXPOSURE SHOWS CDR. LANHAM MAKING FIRST JET LANDING ON CARRIER VALLEY FORGE

THESE EIGHT MEN MADE FIRST JET LANDINGS

Altitude of approach and cut-point were left up to the LSO. The pattern flown was basically the one in use in normal day carrier landings but slightly elongated to allow more time in the final approach for last minute corrections. Lt. L. R. Mix was the LSO in a large respect responsible for the smoothness of operations.

The test of the effectiveness of the preparation came about the night of the 28th of February. Conditions were excellent for the trial; a fair amount of moonlight gave an horizon, and a relatively calm sea limited deck pitch. With the exception of one blown tire, the eight pilots each made two carrier landings with no hitch in the operations.

In talking to the pilots after the landings, it was the general opinion that, after the first pass, the landings were practically the same as during the daylight, except that the speed of the landing jet imposed new time requirements for any corrections necessary to get aboard safely.

Capt. H. B. Temple, skipper of the *Valley Forge*, expressed his opinion of the exercise with a hearty "Well Done" to the pilots and men responsible for the successful and expeditious accomplishment of the task.

Cdr. Lanham, who made the first night jet landing on a flattop, declared: "all of us were enthusiastically optimistic about the capabilities of these jets. This is just another point proving that jets are here to stay as shipboard fighters capable of operating at night, during adverse weather, and any other time when they are needed. We take a back-seat to no other fighter except for time remaining in the air, which record, I believe, is held by an Aeronca."

In the accompanying photograph, pilots are shown in the ready room for the post-flight questions. They were, left to right, and bottom to top: LCdr. A. D. Pollock, VF-51 CO; Cdr. E. J. Pawks, VF-52 CO; Cdr. Lanham, CAG-5; LCdr. J. H. Boydstun, VF-52; LCdr. H. F. Thompson, VF-51; LCdr. J. J. Davidson, VF-52 exec; Lt. D. D. Engen, VF-51, and LCdr. W. R. Sisley, VF-51 exec.

The night flying picture of what looks like a couple of fireflies with "hotfoots" is really a time exposure shot of Cdr. Lanham and his F9F *Panther* making the first night jet carrier landing in the long history of naval flying, and represents another in the Pacific Fleet's long list of "Firsts" in aviation operations.

In explanation of this picture, the pattern of lights is composed of the port and starboard wing light in the beginning and the starboard running light and approach light in the final part of the landing.

Note the rollback on the deck, the pattern of the plane director's lucite wands and the small blur of cockpit light reflections from the canopy. The straight dashed line projecting out from the LSO platform has all puzzled; however, it appeared in only one out of 12 pictures, so it was believed to be a negative flaw inserted by a gremlin.

ARMITAGE FIELD AT DESERT-BOUND INYOKERN HONORS TEST PILOT KILLED IN ROCKET TESTING

MOFFETT FIELD NAMED AFTER THIS ADMIRAL

Field Names Honor Heroes

THE PHONE rang. "This is the Hydrographic Office," the voice said. "Can you give us a list of the names of airfields at various naval air stations and the men they were named after?"

The NAVAL AVIATION NEWS writer who had answered the phone puzzled a little, trying to think what section in the Navy approves names for airfields.

"No, we haven't any list, but it might be a story for the News if we can get one. We'll call you back when we get it."

That started it. Who to call? BuShips names ships, might try them and see who finally approves the names. Maybe they approve airfields too.

So NANEWS called BuShips information. They referred us to ship section. No, they didn't know about any list of airfield names. Did you try BuAer? So we called up BuAer historian. He never heard of any list, but had we tried the shore establishments division?

A phone call there yielded the information that Bureau of Yards and Docks built air stations, maybe they had a list of the names. We called up one of our secret operatives in that bureau who usually knows everything. He didn't know, but he'd find out.

Meanwhile, the NANEWS writer called up the Navy history section, a Rear Admiral no less. His secretary advised they did not keep lists of airfield names and suggested we try somewhere else. Our BuDocks operative called back to advise that his source said we might get a list from Chief of Naval Operations shore bases section.

That line was busy, so we called BuPers shore establishment section. "Do you people name air stations or know who does?" we asked. The voice at the other end, obviously just out of secretarial school replied, "No sir, we don't," and let the matter drop there.

We called the OpNav shore bases outfit again and were advised they handled only one kind, the airfields came under an aviation bases section in DCNO (Air). We wondered why we hadn't called them in the first place instead of going through the task of being passed from Bureau to Bureau and office to office. That probably was just too close to home—it would have been too easy.

We trudged over to aviation bases section in the next corridor and asked a few lieutenants, commanders and captains. Nobody knew just why, offhand, the Navy no longer names its airfields after heroes, as does the Air Force.

However, during the past war many landing fields and fighter strips on Pacific islands acquired names which never went through the red tape of being approved or disapproved officially. Following is a list of naval and Marine airfields, some active today and some defunct, which NANEWS was able to compile from various sources:

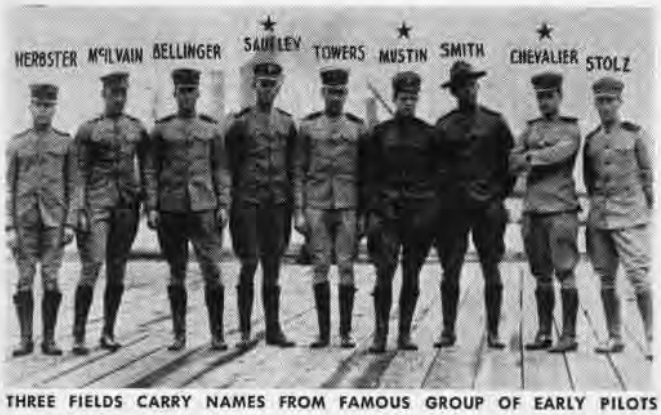
Mustin, Philadelphia—named for Capt. H. C. Mustin, Naval Aviator #11; one of naval aviation's outstanding early leaders.

Turner, Quantico—Col. T. C. Turner, who made first U. S.-Haiti flight; later director of Marine aviation.

Chambers, Norfolk—Capt. W. I. Chambers, first head of naval aviation, before there was a Bureau of Aeronautics.

THIS SMALL FIELD AT PHILADELPHIA NAMED FOR CAPT. H. C. MUSTIN

HENDERSON FIELD, GUADALCANAL, WAS NOT ALWAYS THIS NICE



THREE FIELDS CARRY NAMES FROM FAMOUS GROUP OF EARLY PILOTS

RECTANGLE FIELD AT PENSACOLA HONORS PIONEER PILOT, CHEVALIER

Bourne, St. Thomas, V.I.—Maj. Louis M. Bourne, USMC, first man to fly non-stop from U. S. to Nicaragua. Made it in 1928 in 13 hours from Miami.

Brown, Quantico—2nd Lt. W. V. Brown. Early Marine aviator killed in operational crash in June 1921.

Chevalier, Pensacola—LCdr. George deC. Chevalier, Naval Aviator #7 who made first landing aboard the carrier *Langley*.

John Rodgers, Honolulu—Cdr. John Rodgers, leader of first trans-Pacific flight from San Francisco to Honolulu.

Bristol, Argentia, Newfoundland — RAdm. Mark L. Bristol, first official director of naval aviation, successor to Capt. Chambers.

Armitage, Inyokern, Calif.—Lt. John Armitage, test pilot who was killed at Inyokern naval ordnance test station during the war during rocket firing experimentation.

Harvey, Inyokern—LCdr. Warren W. Harvey, outstanding in the development of fighter tactics; died shortly before the war.

Ream, San Diego—Maj. William Roy Ream, Army doctor, medical officer of Rockwell field on North Island in WWI. Ream earlier was called Oneonta field.

Page, Parris Island, S. C.—Capt. A. H. Page, USMC, made first instrument flight from Akron to Washington in 1930, winning DFC.

Corry, Pensacola—LCdr. W. M. Corry, Jr., winner of Congressional Medal of Honor for giving his life to rescue his passenger after plane crashed in 1920.

Bronson, Pensacola—Lt. (j.g.) C. K. Bronson, Naval Aviator #15, killed in 1916 when his plane disintegrated in the air due to premature bomb explosion.

Whiting, Pensacola—Capt. Kenneth Whiting, Naval Aviator #16. CO of first U. S. Navy aeronautical unit to reach Europe in first World War. First exec of carrier *Langley*.

Saufley, Pensacola—Lt. (j.g.) Richard C. Saufley. Naval aviator #14. Killed trying to break own endurance record of 8 hours 43 minutes in Curtiss pusher hydroplane.

Ellyson, Pensacola—Cdr. T. G. Ellyson, Naval Aviator #1. Aided in developing catapaults and first pontoons.

Barin, Pensacola— Lt. Louis T. Barin, Naval Aviator #56. Test pilot in World War I; member of crew NC-1.

Cabaniss, Corpus Christi—Cdr. Robert W. Cabaniss, World War I naval aviator and gunnery instructor killed in plane accident off Navassa Island, West Indies, in 1927.

Gillespie, Corpus Christi—Brev. Major Archibald M. Gillespie.

ELLYSON, WHITING FIELDS HONOR THESE MEN

Chase, Corpus Christi—LCdr. Nathan B. Chase, early naval aviator killed in plane crash in 1926.

Rodd, Corpus Christi—Ens. H. C. Rodd, member of the crew of the NC-4, first plane to fly non-stop across the Atlantic ocean.

Cunningham, Cherry Point, N. C.—LCol. Alfred A. Cunningham, Marine Corps Aviator #1.

Moffett, Sunnyvale, Cal.—RAdm. W. A. Moffett. One of naval aviation's biggest "names," chief of BuAer, leader in lighter-than-air progress.

Reeves, San Pedro, Cal.—RAdm. J. M. Reeves, leader in use of aircraft in naval tactics.

McCalla, Guantanamo, Cuba—Capt. Bowman H. McCalla, CO of the cruiser *Marblehead* which helped capture Guantanamo Bay in Spanish-American war.

Ault, Whidbey Island, Wash.—LCdr. William Ault, *Yorktown* pilot killed in the battle of Coral Sea. He guided the great raid of carrier planes over Owen-Stanley mountains from Port Moresby to Salamaua where it sank eight Jap ships.

Shea, Squantum, Mass.—LCdr. John J. Shea, USNR, killed in action while serving aboard the CV *Wasp* early in the war. He was exec of the station when it was a Reserve base in 1934.

CHERRY POINT FIELD HONORS CUNNINGHAM

Webster, Patuxent River, Md.—Capt. W. W. Webster, one-time head of Naval Aircraft Factory.

Cecil, Jacksonville—Cdr. H. B. Cecil, killed in the crash of the dirigible Akron in April 1933, along with Adm. Moffett.

Lee, Jacksonville—Ens. T. B. Lee, World War I aviator.

Brown, San Diego—Cdr. Melvin S. Brown, exec of Lexington killed in crash in 1936 near San Diego.

Stickell, Eniwetok—Unknown.

Geiger, Spokane—Maj. Harold Geiger, pioneer in Army aviation, veteran dirigible pilot in W.W.I. Navy Reserves fly from this field now, along with USAF.

Buckley, Denver—Lt. Harold Buckley, AAF, killed in France in 1918 repelling a German aerial attack.

Hensley, Dallas—Col. William N. Hensley, Jr., who helped develop the field as a Reserve base in the '20's.

During the war the Marines had a number of fields or landing strips named after their heroes. Most of these fields are now jungle-grown but the tradition lives on. They include:

Henderson, Guadalcanal—Maj. Loften R. Henderson skipper of VMSB-241 at battle of Midway. His was first plane hit by AA and he was credited in some quarters with diving his crippled plane into the stack of a Jap carrier. A field on Midway was named after him before the one on Guadalcanal.

Moret, Zamboanga, Philippines—LCol. Paul Moret, killed in a crash at New Caledonia in 1943.

Titcomb, Mindanao—Capt. John A. Titcomb, communications officer killed by Jap sniper while directing close air support mission on Luzon.

Bauer, Vila, New Hebrides—Maj. Harold W. (Indian Joe) Bauer, Congressional Medal of Honor winner with 11 Jap planes to his credit.

Finucane, Guadalcanal—2nd Lt. Arthur E. Finucane.

Sailer, Guadalcanal—Maj. Joseph Sailer, Jr., CO of VMSB-132, killed while attacking Jap DD, winning the Navy Cross.

Haring, Efate, New Hebrides—2nd Lt. Richard D. Haring.

Taylor, Efate—2nd Lt. Lawrence C. Taylor, killed while intercepting 27 Jap planes raiding Henderson field on Guadalcanal.

Hawkins, Tarawa—Lt. William D. Hawkins, killed leading a platoon during the assault and capture of Tarawa.

Dyess, Roi—Col. Aquilla J. Dyess, Congressional Medal of Honor winner, killed in the capture of Namur island.

The Navy also honored several of its heroes during the war by naming fields after them:

Isley, Saipan—Cdr. Robert H. Isley, killed by AA in 1944 in pre-invasion raids with VT-16.

Mullinix, Tarawa—RAdm. Henry M. Mullinix, ex-skipper of the *Saratoga*, killed when the CVE *Liscombe Bay* was hit by a torpedo off Makin Island. A model airplane field near Corry Field, Florida, also was named after him.

O'Hare, Apamama, Marshalls—LCdr. Edward H. (Butch) O'Hare, outstanding Navy fighter ace who shot down five Jap bombers in one action.

Carney, Guadalcanal—Capt. James V. Carney, USN, killed in aerial action early in the war.

Waldron, Corpus Christi—Commanding Officer of Torpedo Squadron 8 which, with the exception of Ensign Gay was wiped out at the Battle of Midway.

Some Reserve squadrons are flying at naval air stations bases on commercial fields named for aviation notables. St. Louis Reserves fly from *Lambert* field, named for Maj. Albert Bond Lambert of Listerine fame who donated the first plane to Reserve pilots there back in 1926. New York Reserves use *Floyd Bennett* field, named for the man who piloted Adm. Byrd over the North Pole that same year. Minneapolis Reserves fly off *Wold-Chamberlain* field, named for two World War I pilots.

NARTU JAX AIR BOOTS TRY ON WORK UNIFORMS

H. S. Seniors Get Break

Summer Cruise Slated for Air Boots

The Naval Air Reserve's eight-weeks "air boot" course, which proved so successful last year, is slated for a repeat performance this summer at some 20 naval air stations throughout the country.

This means that 2100 young men, selected mostly from high school graduating classes, who enlist in the Naval Air Reserve as airmen or seamen recruits, will get to spend two months aboard a naval air station, acquiring aviation know-how.

They will follow the same action-packed schedule which left last year's pioneers breathless and enthusiastic, and turned them into full-fledged members of the Naval Air Reserve team.

Through classroom instruction and actually working on the line and in the shops and offices, they will learn aviation fundamentals at first-hand, from propeller-plane maintenance to the theory of jet operations. Liberal doses of athletics will be crammed into the program.

According to present plans, the Reserve "air boot" course will be given at naval air stations and naval air reserve training units located at Anacostia, Atlanta, Columbus, Dallas, Glenview, Grosse Ile, Jacksonville, Los Alamitos, Memphis, Miami, Minneapolis, New Orleans, New York, Norfolk, Oakland, Olathe, Seattle, Squantum, St. Louis, and Willow Grove. The course is scheduled to begin on or about 20 June, depending on local high school closing dates, and applications are now being accepted.

Constitution Makes Record

Sky Giant Kept Busy On Fleet Tasks

The Navy is trying to lease its two R60 *Constitutions* because they cost too much to operate out of its ever-diminishing budget, but in the meantime the big plane is really proving a boon in transporting large numbers of personnel.

One of the two *Constitutions* is having its 1,000-hour heavy maintenance. According to word from Lockheed, the plane held up so well, it may be necessary to conduct this check only after each 1,500 hours. This would save considerable money.

The second plane was busy flying around the country during January and February. Between 21 January and 24 February, it called at 37 airfields, transported 1,976 passengers which, with cargo, totalled 323.2 tons of lift. It was in the air 139 hours and completed five transcontinental flights without a single major flight discrepancy.

It began its series of outstanding flights by lifting 148 passengers and baggage from Norfolk to Quonset, a payload of 36,000 pounds. Next it hauled 126 passengers from Argentia to Miami and 125 from Norfolk to Andrews Field, Willow Grove, Floyd Bennett and Squantum. It finished off January by flying 103 from Quonset to Atlantic City.

February saw the *Constitution* still busier. Flights deploying fleet units and supporting fleet operations added 91 hours and 41 minutes to its flight log. In the five weeks ending 24 February, it completed 1,355,821 passenger miles and 242,800 ton miles. Fleet Air Logistic Support Wing is going to miss its hard-working giant.

Aviation editors *and writers representing news services, newspapers and magazines made a flight recently in the Delta, the Navy's all-weather research plane, an R5D. Guests were flown to Richmond from Anacostia where the zero reader, omni-range, automatic letdown on ILS and Distance Measuring Equipment were demonstrated, appropriately enough, in a blinding snowstorm. After briefing on the project and lunch at NATC Patuxent Md., the group returned to Washington by bus — the whole area was socked in so tight with snow that no plane, not even the Delta, was allowed to land.*

BASEBALL PLAYERS (JG)

NAS JACKSONVILLE — It's "slide, Kelly, slide!" when springtime Saturdays here brought out 600 teen-age boys of the city and environs to Mason field to learn the rudiments of baseball.

The boys were all members of the Jax-Navy Boys Baseball Training School, which launched its second annual season this year. Launched at the suggestion of Capt. A. I. Malstrom, commanding officer of the station, it is fast becoming a tradition here, doubling its enrollment the second year. In fact, a limit had to be fixed to keep the entire station from being overrun with the young aspirants to the major leagues.

There is no kidding about the purpose of the school. It is baseball, coached by Navy players, city athletic directors, and a sprinkling of big name big league ball players from the major league training camps in Florida. The latter not only lend a distinct air of high level ball-playing to the school, but in turn are showing increasing enthusiasm for the plan which builds future ball players.

Directing the school this year is LCdr. George Nulf, welfare and physical training officer at NAS Jax, assisted by Lt. (jg) Richard E. Garver. Frank McCaffrey, who coaches the station's ball club and one time was a Boston Red Sox player, is head coach.

The problem of transporting hundreds of boys to the air station by 9:30 a.m. was solved by a joint plan developed by the Navy and Jacksonville Coach Co. The latter honors membership cards to the two central loading points where Navy busses pick up the boys. Some kids leave home at 6 a.m. to make the trip.

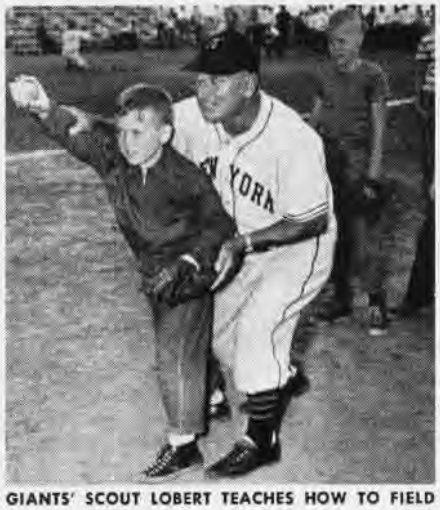
DODGERS BARNEY, ANDY HIGH, SUKEFORTH AND JAX COACH MCCAFFREY WITH YOUNG BALL HAWKS

One of the principles maintained from the first is that no fees of any kind are charged, no professional affiliations in the administration of the school are permitted, and all services are voluntary. The school, wholly for and in the interest of the boys from 12 to 19 years of age, ran for five weeks this spring. It wound up with an "all star" game between outstanding players.

Winners of this coveted honor were selected for proficiency, attentiveness to instruction and full attendance. They were awarded special sleeve emblems distinguishing them as "Jax-Navy All Stars." Wallet-size certificates were presented to all boys who completed the course.

CITY HEADS CONFER WITH MALSTROM, TERRY

GARVER, GARVEY SIGN UP EARL MACK, JOOST


GIANTS' SCOUT LOBERT TEACHES HOW TO FIELD

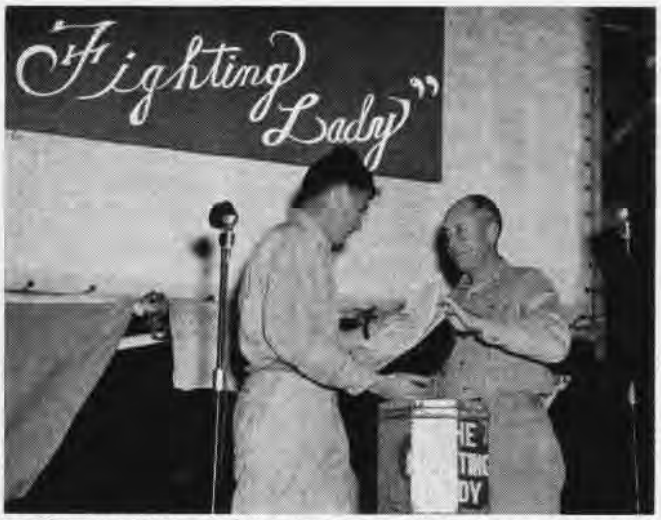
Among the major league ball players who coached the boys were John "Hans" Lobert, N.Y. Giants scout; Clyde Sukeforth, Rex Barney and Andy High of the Brooklyn Dodgers; Mickey Cochrane, Jimmy Dykes, Joe Coleman and Eddie Joost of the Philadelphia Athletics, and Tony Ravish, Giants coach. Bill Terry, former manager and Giants player, now in business in Jacksonville, worked with the boys and gave them a good picture of baseball know-how gained in his 22 years of major league play.

The job of helping line up major leaguers to assist in the school fell to Garver and Lt. Hugh Garvey, public information officer at Jax. They visited various training camps, along with sportswriters from local papers, to interest players in assisting the school.

A board of directors, composed of public-spirited local citizens, naval officers of the station and newspapermen decides on matters of policy and lends its influence in securing the type of whole-hearted cooperation that has built the project to its present scale.

Supporters of the school point to it as having a wholesome effect on the youngsters of the community, diverting their attentions along athletic lines and giving them an insight into discipline and efficient command as exemplified by the Navy. It instills in them a lasting respect for their country's government and its military services.

THIS PROUD SHIP MADE AN OUTSTANDING RECORD IN MANY BATTLES



LT. LONG PRESENTS FILM FOR PREMIERE FLEET SHOWING TO CAPT. COMBS

THE YORKTOWN STORY

★ In honor of the men who served on the YORKTOWN, this brief account of CV-10 takes the place of the squadron history for this issue. A reunion of CV-10 men was held in New York City 14 April.

IT MAKES no difference whether CV-10 is called "the Old Girl," "The Y," or simply "The YORKTOWN," for each title is one of affection, a tribute to the spirit, integrity and character of a never-to-be-forgotten ship. In her first 18 months of combat, "The Fighting Lady" made good her proudest title in the critical and hard-fought carrier battles of the Pacific. She fought from Marcus through Okinawa, and finally carried the war to the homeland of the enemy and dropped her anchor in Tokyo Bay.

From the time her keel was laid—six days before Pearl Harbor—the *Yorktown* was an aggressive ship. By 21 January 1943, she was ready for launching and impatiently slid into the water several minutes before the appointed time. Surprised when the ship started moving, Mrs. Franklin D. Roosevelt, her sponsor, stepped forward and quickly smashed a bottle of champagne on the receding prow of the *eager* ship.

Four months after her commissioning on 15 April 1943, she was fighting the war in the Pacific, sending the fighters, bombers and torpedo bombers of Air Group FIVE against Marcus. After Marcus came strikes on Wake Island, the Gilberts, and Kwajalein, and by then she was fighting like a veteran. The rows of "setting suns" grew upon her island structure. Off Kwajalein, the night of December 4, the fleet was under torpedo attack for four hours. The *Lexington* was hit but not put out of control, and the *Yorktown* with her customary aplomb was unscathed.

On February 16 and 17, 1944, the *Yorktown* was off Truk, exploding that myth of impregnability with bombs and strafing fighters. The daring strike on that great Japanese naval base not only neutralized it, but gave new heart to the struggle.

For the next three months, her log reads like a March of Time account of conquest in the Pacific—Palau, Woleai, Hollandia, and Truk again.

In June with Air Group ONE aboard, the *Yorktown* was in the Philippine Sea for initial attacks on the Japanese in that area. Her Air Group accounted for scores of the 385 planes shot out of the air in one day. They were happy warriors in the Marianas Turkey Shoot, and still greater victories lay ahead.

On the afternoon of June 20, a search plane from the *Hornet* spotted a Jap task force. Forty-five minutes later, at 1630, the *Yorktown* and other carriers launched their strike groups. The Japs didn't know it, but the heat was on.

THE ATTACKING planes arrived over the Jap fleet at 1840, 300 miles from the *Yorktown*, to find that there were far more ships than had originally been reported. So much the better, there were more to hit! They struck at the force with torpedoes and bombs; and the Japanese threw everything they had at the attackers, but still our carrier pilots kept coming in with one torpedo and bombing run after the other. Until sunset, the raiders kept on hitting. One carrier and two oilers were sunk, and four carriers, one battleship, one cruiser and an oiler damaged.

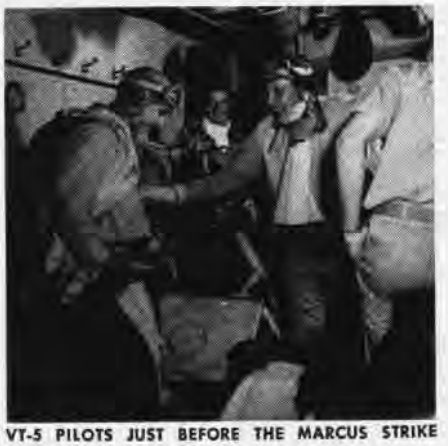
The distance to the target and back and the battle itself had taken time—and precious fuel. Pilot after pilot came back only to find that he could not quite make it. To keep the fleet in darkness was to lose men and planes and possibly impair the victory brave pilots had risked their lives to gain. Admiral Mitscher ordered the lights on! With star shells, floodlights and searchlights signalling home base, the planes came in to land on any available carrier or in the water for rescue. All in all, the *Yorktown* lost 18 planes in action, three pilots and four crew members, but a great victory had been won.

AT THE END of her first cruise, the island structure of the *Yorktown* was well stencilled with 400 Jap flags representing planes destroyed, 200 probably destroyed plus 30 odd surface craft sunk and 60 damaged. Her maiden cruise was over, and her fame was soon to reach the world when the pictorial record was released under the title of "The Fighting Lady."

In August, the *Yorktown* returned to the West Coast for new gear and refitting, and in autumn she headed for the Indian country again. In November she was striking at shipping in the Philippines and supporting troops in that area. Manila Bay and Luzon received her attention for several weeks. A typhoon struck the fleet with great damage on December 18, but the *Yorktown* safely rode out 60-foot waves.

After spending Christmas 1944 at Ulithi, the *Yorktown* went into the China Sea, penetrating an unknown territory literally surrounded by Jap strength. Successful strikes on fields in Indo-China, and shipping and fields at Hong Kong and Canton highlighted the adventure. Tokyo Rose singled out

CAPT. CLARK AND RADM. RADFORD ON BRIDGE



VT-5 PILOTS JUST BEFORE THE MARCUS STRIKE

WORD COMES THEIR MATES HAVE BEEN RESCUED

the *Yorktown* for her predictions of doom to the carrier fleet and claimed it would never get out of the China Sea.

Certainly the *Yorktown* expected a fight—and was not disappointed. Day and night battles followed. Night fighters got some of the Jap planes; ship's fire caught others. Fourteen were shot down by the fleet in one day, twelve the next. The *Langley* and *Ticonderoga* were hit, but the *Yorktown* came through unscathed. Back to Ulithi she went, but not before delivering a passing blow at Okinawa, a calling card that would be made good later.

On February 10, 1945, Fast Carrier Task Force 58 set a course for Tokyo, and on the 16th, there occurred the day the whole Navy had been waiting and working for. This was the main event to which all earlier battles and invasions had been prelude. At dawn, the 16th, a raw cold windy day with a low overcast sky, the *Yorktown* launched her planes for a full-scale attack on Tokyo. It was a great moment! The enemy was taken completely by surprise and failed to recover and counter the attack.

The *Yorktown* then turned to support the invasion of Iwo Jima. For a number of days, the *Yorktown* sent her planes to blast Suribachi and the caves and resistance pockets on the beaches. With the initial assault troops well dug in and two airfields in our hands, the force left Iwo to strike Tokyo again, then turned back to Ulithi.

By March 18, Task Force 58 was underway for the attacks preliminary to the Okinawa landing. No one knew that the Japs were preparing to send 3,000 *kamikaze* planes against our naval forces in a fanatical attempt to stop the invasion.

Two weeks before D Day, April 1, softening-up operations preceded the actual invasion. Scarcely had the strikes begun when customers began to appear for the Combat Air Patrol and the ship's guns. That afternoon three *Judy's* came in. The first was splashed by AA fire, but the third came out of the clouds to drop a bomb that landed on the starboard signal bridge, killing three men and wounding 18 others. The *Judy* began to disintegrate at the pull-out, and one officer was picked up as a prisoner of war.

April 1 was April Fools' Day for the Japs. Making a feint on the east side of the island of Okinawa, we sent our main amphibious forces in on the west side, securing a strong toe-hold before the enemy could look behind him. The enemy was sending in reinforcements. The night of April 1, *Yorktown* night fighters discovered a support group of several transports, escorted by a cruiser and some destroyers, about 200 miles to the north. By strafing and rocketing, they forced the Japs to beach their ships and abandon the venture. Not content with aerial battles in the skies over Okinawa, Air Group NINE put the finishing touches on the battleship *Yamato* and the cruiser *Agano* plus several destroyers. Never again did the Japs venture out with the remnants of their fleet.

The campaign went on, day after day. Strike! Strike! Strike! And all the while the Task Force was battering away at enemy installations, the Japanese were trying to hit back. Carrier after carrier was hit by *kamikazes,* but the *Yorktown* kept on beating off attacks, launching her planes and making gunnery pay tremendous dividends. After 61 days of combat, the *Yorktown* withdrew to Ulithi on May 12th, and Air Group NINE went home with the most imposing scoreboard of the ship's career.

On July 1, the fleet sortied and went northeastward. Then followed a month of blows at the home islands of Shikoku, Honshu and Hokkaido, blows that sent the reeling empire down for the count. The fleet ranged at will up and down the coast, striking like the veteran fighter it was—quick powerful blows at strategic targets, Kobe, Osaka, Muroran, Kamishi. Even the battleships and cruisers got into the offensive action, going in to bombard coastal industrial areas under the watchful eyes of the carriers who furnished spotting planes and the necessary air cover.

August 6 found the fleet off the coast of Honshu, pounding airfields and shipping in a routine manner. At 1930 that evening, word came of the dropping of the atomic bomb on Hiroshima. Three days later the second atomic bomb was dropped on Nagasaki. The same day a Jap *Grace* sneaked in with friendly *Corsairs* and made a suicide dive on the *Wasp* close by the *Yorktown.* Flamed first by one of the *Wasp's* fighters and again by ship gunfire, it crashed 50 feet off the starboard bow of the *Wasp,* the *Yorktown* getting in a few shots which proved to be the last of the war from her batteries. On August 10 came the word of the Japs' offer to consider the terms of the Potsdam ultimatum.

At last, it was over! Japan surrendered, and Commander-in-Chief, Pacific Fleet, gave the order to cease offensive operations. Orders were sent out at once to all planes to jettison bombs and return to base. Tragically, *Yorktown* pilots on the way home were jumped from above by a strong force of Jap fighters. Four of our pilots were lost by this final act of treachery.

Peace meant the end of a great fighting career of a great carrier. It had fought under the leadership of distinguished skippers, Capt. Joseph J. Clark, Capt. Ralph E. Jennings, and Capt. Thomas S. Combs. It had launched brilliant Air Groups, and the gallant men aboard had played a significant role in giving "The Fighting Lady" an unchallenged place in history. The *Yorktown,* named for an early victory, gave its share to secure another, and thus took its place among all the great ships in the history of the United States which have fought gallantly and courageously to preserve the rights of man.

LEAD POISONING

The dangers of lead poisoning to jet pilots and maintenance personnel working on jet engines is pointed out in this article by LCdr. Sidney I. Brody (MC), flight surgeon attached to Aircraft Development Squadron Three.

MAINTENANCE MEN WORKING ON JET ENGINES BURNING TETRAETHYL LEAD RUN DANGER OF POISON

THE ADVENT of jet propulsion in aircraft has produced a great number of aeromedical problems, the majority of these centering about the pilot, his equipment and the effects of flight in these aircraft. There exists, however, a lead poisoning hazard to the health of the personnel engaged in handling naval jet aircraft engines that should arouse the interest of flight surgeons, particularly those assigned to activities possessing jet airplanes.

This matter which primarily involves ground personnel is a familiar one to the industrial physician and heretofore there has been little cause for its inclusion in aviation medicine. However, owing to the insidiousness and important aspects of lead poisoning, it is felt that serious consideration be given this subject in order that preventive measures may be instituted before the disease entity becomes apparent.

Lead is regarded as the outstanding poison in industry, and it has been accused of probably contributing to more cases of illness and death than any other single substance. In chronic cases, symptoms become manifest as a result of the cumulative action of minute quantities taken into the body.

The respiratory system offers the usual port of entry and the Division of Industrial Health, U.S. Public Health Service has established 1.5 mgm. of lead per 10 cubic meters of air as the maximum permissible concentration, "and this quantity may be considered as a daily dose which should not be exceeded if disability is to be prevented."

The hazard to the health of jet engine maintenance personnel stems from the use by the Navy of ethylated gasoline as a fuel for jet aircraft. Unquestionably, the impracticability of storing different fuels aboard carriers has prevented the adoption of kerosene throughout the fleet for this purpose. When available, gasoline of the lowest octane rating is used, and since 91 octane is frequently stored for use by SNJ's and other type airplanes its low cost also favors its use in jet aircraft.

LEAD DEPOSITS CAN COLLECT IN AFTER SECTION

However, it is not uncommon to find 115/145 octane gasoline used in these engines. Navy specifications provided for 4.6 cc of tetraethyl lead per gallon, in gasoline of 91 octane rating and above: 80 octane gasoline has a much smaller quantity, possessing 0.5 cc per gallon. Since 64.08% of tetraethyl lead is metallic lead, it is obvious that a considerable amount of this substance may be extruded in the exhaust of the jet engine.

There exist many differences concerning this matter between conventional and jet aircraft. In the latter case, greater significance must be attached to the problem for a number of reasons. The jet engine uses three or four times the quantity of fuel used in piston engines and also the area of the engine which is contaminated by the fuel residue is much greater in jets.

FURTHERMORE, instead of the flaky or scaly deposit as seen in conventional engines, the sediment is usually found to adhere tenaciously to the surfaces. It has been determined by investigations at Pratt & Whitney Aircraft that the amount of deposit on engine parts may range from a trace upward to a thickness of one thirty-second of an inch or more with the weight of the sediment amounting in some instances to a few hundred grams depending on the length of engine running time and the quantity of leaded gasoline used. It was also found that the particle size of the powder varies on the average from one to four microns. In composition, lead sulfate appears to predominate, having a percentage of from 52 to 62 per cent while lead oxide comprises the remainder of the deposit in the amount of from 35 to 45 per cent.

It can readily be seen that the overhaul of jet engines using leaded gasoline as fuel will present a problem of safeguarding personnel from the danger of ingesting lead removed from the engine rather than by inhalation, the route generally regarded as being the more common.

However, this avenue of entrance into the body must be considered, and personnel should be aware of the dangers of remaining in the line of exhaust from the standpoint of the inhalation of lead particles. *Shop personnel particularly must realize that sweeping within the shop and brushing the tops of work benches will tend to disperse lead in the air.*

The solution of this problem, of course, is best accomplished by the elimination of leaded gasoline as a fuel for jet aircraft. As noted previously, this is not desirable from the viewpoint of carrier operations. However, since overhaul of jet airplanes occurs for the most part at shore activities, it would

be quite possible to insure a supply of non-leaded gasoline for all shore bases.

This would be preferred to the use of kerosene and similar fuels since no change in the engine governors would be required when the planes were based on a carrier where only high octane gasoline is available. Thus the transfer of planes from shore to ship could be effected without delay. And since carrier operations are conducted on a windswept deck where personnel are not likely to be in the line of exhaust, the shipboard danger of lead intoxication is considered to be negligible.

For the present, however, on certain shore stations where ethylated gasoline is used for fuel, prophylactic measures should be instituted. The clinical diagnosis of incipient lead intoxication is most difficult until fairly clear cut symptoms are manifested. The so-called "lead line" on the gums is seldom seen in those with good mouth hygiene and is unreliable at best. Blood and urine examinations appear to be of great value in the hands of some and of dubious value in the hands of others.

It is assumed that proficiency in technique is responsible for the differences. According to Gradwohl, "It is believed that basophilic punctation alone does not prove the case." There appears to be general agreement that the history, symptoms and a consideration of the entire blood picture is necessary before establishing the diagnosis of lead intoxication Since small quantities of this metal if assimilated over a relatively long period of time will produce symptoms, all efforts should be made to preclude this eventuality.

In a development squadron whose complement will be 28 jet aircraft possessing 36 engines, the following preventive measures have been instituted:

A file has been opened containing cards with the names of all personnel both shop and line whose duties are essentially concerned with jet planes. Laboratory studies and pertinent information will be recorded on these cards. Lectures by the squadron flight surgeon on the subject of lead as a poison have been given and safety measures emphasized. When practicable, jet aircraft will be faced so that jet exhausts will flow on the field rather than on the flight line.

HANGAR DECK WORKERS MAY TOUCH LEAD SCALE

Loaded guns, of course, are a more serious hazard and under this condition the planes are pointed towards the field. Line personnel are cautioned not to come within 50 feet of an operating jet exhaust nor close to a hot tailpipe. Covers will be placed on tailpipes when engines are not used so that the after parts of the engine will not be touched.

In the jet engine shops an exhaust fan is to be used to allow for the elimination of contaminated air and all cleaning will be done with a vacuum cleaner, the disposal of this waste being conducted under supervision. Work benches are to be covered with linoleum in order to provide the smooth surface necessary for thorough cleaning.

The scrubbing of engine parts containing the lead deposit is to be done out-of-doors by personnel wearing respirators. Posters emphasizing proper hygiene such as frequent washing of hands, cleansing of finger nails, and wearing clean clothes are to be placed in the shop.

Blood examinations consisting of bimonthly blood smears on jet plane handlers and monthly blood smears on those working in jet overhaul will be routine in an effort to note changes in the count of stippled red cells, for by using Unna's alkaline methylene blue stain, basophilic stippling is found in many normal smears.

Techniques utilizing counter stains such as Wright's only show the coarse granules and the detection of a hundred or more stippled cells per million should be regarded with suspicion. Any complaints of indefinite symptoms of indigestion, abdominal distress, muscular pains, loss of strength or vague nervous disturbances call for complete blood counts and a more thorough evaluation of the individual.

Thus far, preliminary studies and examinations have failed to reveal a case of lead intoxication in the aforementioned development squadron, and at Pratt & Whitney Aircraft safety precautions have been considered responsible for the lack of evidence pointing to abnormal lead absorption among their workers.

One should not lose sight of the fact that lead may, in some instances, act as a potential poison to those engaged in the handling of ethylated gasoline and to individuals working in the overhaul of conventional aircraft engines. In the former instance, the organic lead would be assimilated through the skin and prophylactic measures should be directed toward the avoidance of immersing the hands in this type of fuel. In the latter case, however, personnel may come in contact with the sediment containing lead which may be found in exhaust stacks and on the fuselage immediately aft of these stacks.

Because of the relatively small quantity of deposit as compared with that found on jet engines, routine studies on engine overhaul personnel may not be necessary. *Nevertheless, repeated washing of the hands and insuring that the shops are cleaned with vacuum cleaners would certainly appear to be sufficient to prevent the ingestion and inhalation of lead dust.*

In any case, maintenance personnel should take cognizance of this hazard; awareness of the insidious aspects of this disease will do much toward eliminating its potential harmful effects.

It therefore seems evident that in order to prevent lead poisoning from becoming a problem in the Navy, safety measures should be instituted wherever

(Continued on next page)

PRECAUTIONS IN OVERHAUL SHOP CAN PROTECT WORKERS FROM DANGER

WIND OVER DECK WILL DISSIPATE LEAD FUMES DURING CARRIER WORK

(Continued from page 19)

leaded gasoline is used in jet engines. In addition, the existence of this health hazard should serve as an impetus toward the adoption of non-ethylated gasoline as a fuel for all shore-based jet aircraft.

Editor's Note: **Jets operating on naval air stations will burn JP-3 jet fuel which has no teterathyl lead in it, instead of gasoline, as the present switch-over to JP-3 gains momentum. Because of the impracticability of having a JP-3 fuel system and a gasoline system on a carrier, those ships will continue to stock gasoline since propellered attack planes will not burn JP-3.**

BETH QUALLS SENDS BALLOON UP DURING RAIN

Weather Moves To Alameda

Economy Shift Boosts Station's Staff

NAS ALAMEDA—Navy Weather Central, which forecasts weather conditions for the entire eastern Pacific area, has moved from the Federal building in San Francisco to this air station.

The move, combining with NAS ALAMEDA aerology, will save the Navy $14,000 annually and eliminate duplication of effort. Twenty-six officers and men were transferred, bringing the staff to 60 persons.

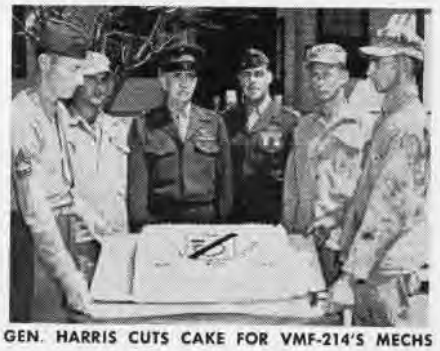
Weather Central makes broadcasts twice daily and during storm conditions makes four forecasts. Information to and from the weather station is relayed from Canada and Mexico, as well as to vessels 1400 miles west into the Pacific. The activity also makes available to pilots cross-sectional maps for destinations as far east as Portland, Me., and west to Pearl Harbor.

GCA BOX SCORE

For the third straight month, actual GCA landings set a new record for the Navy during February. A total of 659 planes were brought in when GCA was required—or else. The score for December was 476 and January 644.

February approaches	10,586
Total approaches	323,703
February instrument	659
Total instrument	13,043

MARINES PASS 2000-HR. MARK



GEN. HARRIS CUTS CAKE FOR VMF-214'S MECHS

MCAS EL TORO — The Marines' famous *Black Sheep* squadron, scourge of the Solomons during the war, set what probably was a peacetime record for fighter squadrons for flight hours.

Flying from dawn until 8 p.m. daily, VMF-214 logged 2,000 flying hours in the first three weeks of March. This total was attained by 32 pilots in 22 Corsairs, only 16 of which were available daily owing to overhaul schedules.

All flights were tactical training hops in which gunnery, night navigation and battle tactics were dominant. A 100% safety record was mantained throughout.

Sufficient funds had been allotted the squadron to carry out an extensive training program during the current fiscal quarter. Fog blanketed El Toro most of January and February, however, and prevented flying more than a few days.

Pilots were determined to fly 2,000 hours during March so when they passed that mark at the end of the third week it called for a celebration. The pilots bought a cake for the enlisted men who had made their record possible through excellent maintenance work, and invited MGen. Field Harris, commander of First Marine Air Wing, to cut the first slice.

In the picture with him are MSgt. James H. McKay, leading chief; MSgt. Floyd L. McAllister, line chief; Lt. Col. Howard A. York, CO of VMF-214; MSgt. Milton H. Jones, engineering chief; SSgt. Kenneth M. Winters, plane captain of the aircraft with the most hours.

One pilot, by making side bets with fliers of other squadrons, collected $55 on the record attained. Another, Capt. John Skorich, collected 94 hours in his log book. The squadron expected to pass 2,700 hours by the end of March.

Naval District Shift Made

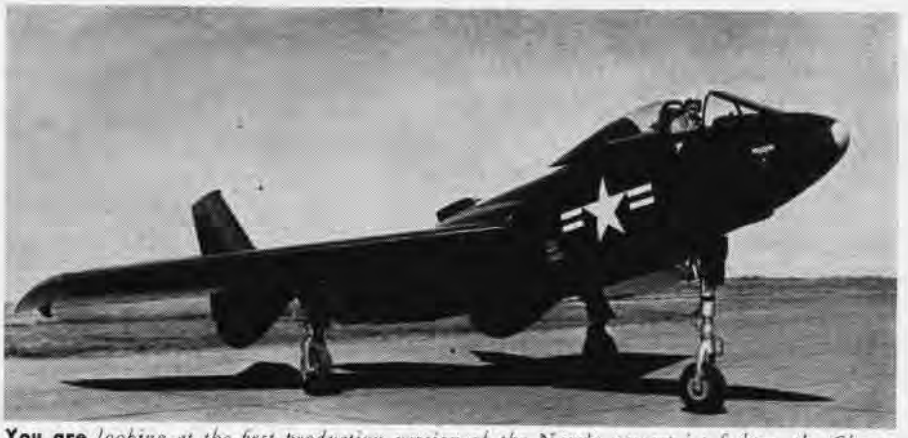
States Transferred Match Army, AF

Slight changes in the states included in the 10 naval districts within the United States have been announced by Secretary of the Navy Matthews.

In the main, they coincide with the boundaries of the six Army and Air Force areas, with the exception of the lower part of New Jersey. Ohio is transferred from the 9ND to the 4ND, with headquarters in Philadelphia. The state of Kentucky, now in the 9ND, is transferred to the 5ND with headquarters in Norfolk. Changes were effective 1 April.

Last September New Mexico was changed from the 11ND to 8ND. The lower part of New Jersey remains in the 4ND and the upper part in the 3ND.

● NARTU ANACOSTIA—S/Sgt. Hrin has perfected a device for the removal of SNB/JRB lord mount bushings. It consists of cutters and a hydraulic piston with attaching heads for forcing the bushing. With this equipment, lord mounts can be removed and inserted with the engine on the aircraft. Drawings and photographs are available on request.



You are *looking at the first production version of the Navy's newest jet fighter, the Chance Vought F7U Cutlass, after it rolled off the assembly line at Dallas, Texas. Minus the spike-like pitot tubes on the nose and wings of the three experimental planes built for the Navy, the production model was flown from Hensley field. The Cutlass is powered by two Westinghouse J-34WE-32 jets with afterburners and is the Navy's first swept-back wing fighter. Chance Vought is still building F4U-5 nightfighters at its Dallas plant for use in the fleet.*

French Carrier Gets Planes

CRANE AT NORFOLK HOISTS F6F ABOARD DIXMUDE AS SB2C'S WAIT TURN

CAPT. MORNU, CO OF DIXMUDE, VADM. STUMP INSPECT CREW OF CARRIER

THE INITIAL shipment of military equipment to Western Europe under the Mutual Defense Assistance Program was loaded on board the French aircraft carrier *Dixmude* on March 8 at Pier 7 of the Norfolk Naval Base.

The shipment, which consisted of 48 Navy *Hellcat* fighters and *Helldiver* torpedo bombers, was presented to the French as the start of the United States' billion dollar program to aid in the fight against aggression.

According to John H. Ohly, Deputy Director for MDAP, this will be the "opening gun in a war against aggressors who are trying to break down confidence in the Atlantic Pact and control the world."

Jack K. McFall, Assistant Secretary of State for Congressional Relations, said, in regard to the shipment, that it takes on added importance because it is "another important development in the welding of a group of free nations into a single active force for peace."

The party of dignitaries, who arrived from Washington at Norfolk were greeted by Rear Admiral R. O. Davis, USN, Commandant of the Fifth Naval District; Pierre Schmitz, French consul at Norfolk, and Pierre Dupont, French consul in Washington.

Following ceremonies on the pier, members of the official party, headed by Vice Admiral Felix B. Stump, USN, Commander Air Force, U.S. Atlantic Fleet, conducted an inspection of the *Dixmude's* crew on the flight deck of the French carrier.

A French Marine honor guard was placed in front of the planes loaded during the official ceremony and now bearing the tri-color insignia of the French Navy. Following the inspection of the sailors on the flight deck, an *a capella* choir sang four selections. The choir, composed of over 40 officers and men of the *Dixmude*, was organized only two weeks ago to sing for the occasion.

American officials attending the ceremonies included four congressmen; Representatives Thomas S. Gordon of Illinois and John M. Vorys of Ohio, both members of the House Foreign Affairs Committee; and Representatives F. Edward Herbert of Louisiana and Leroy Johnson of California, members of the House Armed Services Committee.

Other American dignitaries present were Maj. Gen. L. L. Lemnitzer, USA, director of the Office of Military Assistance, and John Y. Millar of the European Bureau of the Department of State.

Officials of the French embassy were Jean Daridan, acting French Ambassador to the United States; Brigadier General Charles Lauzin, Air Attache; Captain Georges Cabanier, French Naval Attache; Lt. Cdr. Jean Perrin, Assistant Naval Attache; Christian de Margerie, Counselor of Embassy, and Captain Maurice M. Amman, representing General Ely, Senior French Officer of the Standing Group NATO.

Captain Cabanier confirmed that the *Dixmude*, an American-made CVE, originally lend-leased to England, will deliver the planes to Bizerte, North Africa, and from there they will be flown to France. The carrier will then return to the United States for two more loads of aircraft.

An extra week after the loading ceremony was required for the training of the French pilots to handle the planes. Field carrier landings were practiced at the Marine Air Station, Edenton, N.C.

Captain James H. Flatley, USN, Assistant Chief of Staff for Vice Admiral Stump, said that the French airmen "show aptitude above the average" for flying and that he thought they would have no trouble accustoming themselves to the aircraft.

The pilots who are trained here will be sent to various units of the French Navy to pass on and instruct other pilots in the methods of handling the new planes.

Although the shipment of aircraft is not the first to go overseas—shipments of SB2C's (NANEWS, December 1949) were made to Greece during its recent rebellion—it is the first organized and trained cadre to be sent to Europe under the aid program. Other equipment to be sent includes destroyer escorts, tanks, and armament, and will be sent to Netherlands, and other countries.

Farmer-Pilots Visit Navy

Pensacola Has Week-Long Exhibit

NAS PENSACOLA—About 600 flying farmers from Illinois, Indiana, Wisconsin and Michigan landed their little planes at municipal airport here, to spend a week seeing how naval aviation works.

Last August about 300 flying farmers visited the station. Both groups were quartered in the barracks and ate at the mess. While here on March 18, the farmers were taken aboard the *Cabot* to witness carrier qualifications, visited training exhibits and ground school classrooms, visited Corry field to see FCLP, fire fighting demonstrations, a jet flyover and helicopter demonstrations. The *Blue Angels* also put on a show for them.

VP-23—Soon after arriving at Argentia from its hurricane-chasing duties at Miami, this squadron was flying thousands of pounds of mail to USAF personnel at AFB Narsarssuak, Greenland. The lift helped take the load off MATS during Christmas season and gave squadron pilots some Arctic experience not obtainable in sunny Florida.

PLANES WEAR NAVY NAME

ANACOSTIA JRB, ONE OF FIRST PAINTED WITH NEW SYSTEM OF MARKINGS, DISPLAYS NEW LOOK

A GROUP of school children stood on the sidewalk. In front of them a parade of floats, marching men and bands was passing. Overhead a formation of jets whistled past.

"Oh, look at the pretty Air Force planes!" one youngster told her companion.

That sort of thing is all right—unless they are Navy or Marine planes. To end the confusion and also act as a deterrent on pilots who might be tempted to flat-hat on routine hops, BuAer has issued a technical note that planes can have the word "NAVY" or "MARINES" painted in up to two-foot letters on the wing and fuselage.

The word went out that planes may be painted in the following manner for better identification:

FUSELAGE—The words "NAVY" or "MARINES" just forward of the empennage on both sides. Letters will be the largest possible size which can be accommodated on the aircraft, of the following standard series of sizes: 12, 16, 20, 24 or 28 inches. The rudder will continue to carry the name of the station or squadron to which the plane is attached.

If necessary, any markings such as the national aircraft insignia, unit aircraft numerals and the like already on the fuselage can be moved forward on the plane. The model designation, service marking and serial number may be moved aft of the stabilizer leading edge if necessary.

WING—Lettering on the under surface of the right wing, as viewed from in front and below the plane, will be "NAVY" or "MARINES" as appropriate. Letters will be the largest possible size, 24 or 30 inches. Unit identifying letters and the unit aircraft numerals shall be moved inboard, commensurate with symmetry, and reduced to 16″ in size.

If station or squadron identification is applied, in lieu of the unit identifying letters, on the under surface of the right wing, the size of the letters shall be reduced to 16″. If necessary, this lettering can be on two lines if the station has a long name like "Jacksonville" or "Los Alamitos." If two lines are used, the hyphen is omitted and the bottom line centered.

The national aircraft insignia on the underside of the left wing can be moved outboard as far as necessary to accommodate the station or squadron insignia.

The new system of painting identifying names on planes is not mandatory, but the technical note permits commanding officers to put the words on if they desire.

When Marines at El Toro began repainting all of their planes to conform to the new style, they reported it was the first major change in the marking of Marine aircraft in 15 years. Among the first planes painted were two new F9F-2 jets, just received from the factory to replace the TO-1 *Shooting Stars*. The Navy directive allows painting of the squadron number on each plane—a system abandoned before the war for security reasons.

OLD MARKS ON TAIL CONTRAST WITH NEW PAINT

Ejection Seat Film Ready

Movie Checks Pilots On Emergency

Jet fighter pilots who would like to know more about how to operate their emergency ejection seats can do so by viewing a new training film, *Emergency Escape by Pilot Ejection*, just completed by BuAer and the Naval Photo Center.

The 11-minute film, MN-6703, has been distributed to all film libraries and can be secured from them. It explains the workings of the ejection seat in an FH-1. Scenes for the movie were shot at NAS El Centro, Calif., and at NAMC Philadelphia.

West Coast *Marines finally have received their F9F Panthers. In the picture above, LCol. Paul J. Fontana, CO of VMF-311, the only Marine jet squadron on the coast, climbs into his new Panther. The planes will replace the squadron's TO-1 Shooting Stars in which more than 200 jet pilots get their training and drill at El Toro, Calif.*

During a *man's Navy career, he raises his right hand and swears to things a lot of times. Here VAdm. John H. Cassady, DCNO (Air) is sworn in as a member of NACA by John F. Victory, executive secretary. He succeeds VAdm. John D. Price to the post.*

HE IGNORED THE CUT

OVER SHE GOES!

HUNG UP BY ONE WHEEL

Pilot Makes Like Monkey

CVE PALAU—Remember all the exercises and gymnastics you had to do when you went through training? Pretty strenuous, wasn't it? Well, there's one pilot of VC-24 who doesn't seem to mind it a bit; in fact, he specializes in the rope climb.

During recent carrier qualifications on the *Palau*, Midn. Frank E. Toy made five landings in his TBM-3S and had started to come around on his sixth when the trouble started. He came in low in the groove, corrected slightly, but still was low when the LSO gave him the cut. He started to chop the throttle, changed his mind and poured on the coal, intending to take a wave-off.

However, the TBM's tailhook caught #5 wire and the plane flew into the port catwalk and started to fall over the side. The left wheel caught the edge of the 20 mm. gun sponson and held the plane in an almost inverted position.

Pilot Toy found himself hanging upside down from his harness with nothing under him but cold—very cold—green Atlantic. Sensing that a swim would be slightly undesirable, he waited until he was thrown a line. He tied it securely inside the plane. Hanging onto the rope, he unfastened his harness, flipped over in the cockpit, and made like a monkey down the line to the hangar deck.

Later, the arresting gear cable was slipped off the tailhook, the left wheel removed, and the plane dropped into the water.

Pilot Toy does not contemplate any more public demonstrations of his gymnastic ability in the future, but feels that climbing can be quite an art.

THE HOOK AND GEAR HELD

OUT COMES THE PILOT

Adak Gives VR-5 A Sendoff

Ton of Snow Buries Aleutian Offices

VR-5, SEATTLE—When this squadron closed down its operations to the Aleutians, it did so with a bang.

Lt. H. J. Forsgren, officer-in-charge of the Adak detachment, was sitting at his desk a few days before the end came. He looked up and noted that the windows of the office suddenly had become blanketed with snow. Seconds later with all the sounds of impending doom, the window glass was shattered.

Papers scattered helter-skelter and an icy blast swept into the once-warm room, quickly followed by an estimated half ton of new snow. Digging his way out of the snow drift and scattered debris, Forsgren noted the storm had departed as quickly as it came.

Investigation showed the devastation was not caused by some rare phenomenon of nature, but by a large rotary snowplow which had passed the building, catching the office windows in the sights of its artillery-like exhaust snout.

BELOW THE GREEN ATLANTIC! HE MAKES LIKE A MONKEY ON LINE

F3D Night Fighter Powerful

Editor's Note: Little has been said about the Navy's new night-fighter, the F3D. In the following article, E. H. Heinemann, chief engineer of the Douglas El Segundo plant, discusses hitherto unrevealed features of the two-man jet.

TWIN J-34 JETS PUSH SKYKNIGHT IN SPEED RANGE OF INTERCEPTORS, DESPITE RADAR LOADING

NIGHT fighters are a class of airplanes intended to intercept enemy aircraft at night and to bring them down before the enemy's mission can be fulfilled. Most night fighters have been converted from day fighters. The F3D *Skyknight,* however, was designed by Douglas strictly as a night fighter from the beginning and is of the first vintage of jet-propelled night fighters.

The principal difference between day and night fighters is that night fighters must depend upon a large amount of radar equipment for vision in darkness and adverse weather conditions. This usually causes increased weight and lowered performance as compared with day fighters. Despite the penalty of radar-weight, the performance of our night fighters must be superior to that of bombers developed during the same period in both friendly and enemy countries. Anything less would be unacceptable.

The F3D was developed with such performance in mind. Conceived in 1945, the F3D was developed to operate against high performance bombers expected to be in evidence in the early 1950's.

The original specification for this aircraft came as somewhat of a shock to the designers. High speed requirements appeared to be completely incompatible with the requirement of a two-place cockpit arrangement and a large space forward of the cockpit required for electronic night fighting equipment. It was only after trying many arrangements of equipment, crew, fuel, and power plants that the final arrangement of the F3D was chosen.

The Navy's wisdom in establishing such exacting design requirements has, during the past year of testing, been well proved, since it has been amply demonstrated that the airplane, engine, and radar combination can operate successfully above the 40,000 foot altitude level for which it was intended.

LOOKING LIKE LIZARD, F3D CARRIES A PUNCH

In most respects the airframe proper of the F3D is relatively conventional, employing a large percentage of 75S aluminum alloy and details of construction well proved on other Douglas models.

A nose wheel type landing gear was chosen for increased stability and safety during speed take-offs and landings. An auxiliary tail wheel was added to prevent tail structure damage during landings. All landing wheels are retractable and hydraulically operated.

Speed brakes similar to those developed on the AD *Skyraider*-type airplane extend from the aft part of the fuselage by means of hydraulic actuators.

All normal fuel is housed within the fuselege above the engines aft of the pilot's compartment. Auxiliary fuel is carried in drop tanks underneath each wing near the folding joint. Considerable thought was given the installation of wing tip tanks. They were decided against, however, owing to the serious problem of obtaining the necessary lateral control with one tank empty, the increase in wing weight resulting from landing loads with tanks full, the additional complications of folding wings with tanks full, and the problem of filling tanks when wings are folded.

Two Westinghouse J-34 engines were selected as the most suitable engines for this particular arrangement. The power plants are so mounted in the fuselage that after the removal of cowling they can be lowered to handling trucks with a standard bomb hoist. This arrangement makes possible a complete engine change time of only 60 minutes.

THERE WAS much concern originally over the possible loss of intake duct and tail pipe efficiency because of the semi-flush nature of the air intakes and skewed axis of tail pipes. It was found, however, after a considerable amount of wind tunnel testing, that it was possible to obtain normal duct and tail pipe efficiencies with these arrangements.

Cabin pressurization and cooling is provided by an AiResearch expansion turbine fed by the engine compressors feeding into the cabin.

The cockpit has the Navy standard arrangement except for side-by-side seating. All instruments and panels are indirectly red-lighted, with all secondary control handles resembling the component they operate.

Aerodynamicists will probably shudder at the large flat windshield, but after testing many arrangements, it was concluded that the windshield chosen offered the lowest possible drag to meet all requirements, including gun-sighting and night vision.

Aero-medical studies of the F3D quickly showed that it would be impossible to bail out of an airplane of

this performance in the usual manner without injury to the occupants. Jettisonable seats were first recommended and considered the solution to the high speed bail-out problem.

Jettisonable seats, however, involved additional objectionable weight, compromised the seating arrangement and equipment, and had the disadvantage of requiring the cockpit enclosure to be sliding and therefore more subject to pressurization troubles. Improved methods of egress were studied at great length.

THE FINAL conclusion was that the safest means of escaping at high speed would be to slide feet first, downward and aft, through an escape chute. Its bottom door acts as a wind screen to break the free air blast. This system has recently been tested very extensively by numerous actual bail-outs. As a result it is considered not only very successful but an improvement over jettisonable seats for aircraft of this speed range.

Provisions are made on the outer wings for carrying fuel tanks, as previously mentioned, or bombs, rockets, and other armament devices as may be desired to increase its utility and versatility.

From the outset it was considered aerodynamically essential that all radar antennas be mounted within the airplane's normal contours. This required a considerable amount of antenna research, and the development of non-metallic structures such as the fuselage nose, fuselage tail, vertical tail tip, and dorsal fin, which house various forms of antennas. While these non-metallic structures of the laminated glass cloth variety are considered satisfactory for the purpose intended, it is doubtful that this construction will be used extensively for parts that can be made of aluminum alloy.

AS A RESULT of many years experience with military aircraft, the designers of the F3D were particularly conscious of the importance of airplane readiness for military operations. Ease of maintenance was, therefore, stressed from the outset, and every effort was made to reduce servicing and replacement time to a minimum.

In 1945 when the *Skyknight* was conceived, calculations showed that the minimum combat radius requirements could barely be met. Very strict weight control was put into effect, and extra tankage was provided so extra fuel could be carried in the event guaranteed weights could be bettered.

So successful were these efforts that combat radius and performance in general have been improved to the point where the F3D is comparable in many respects to contemporary day fighters. Tests have indicated that it can successfully intercept any high altitude bomber that may attack this country during the F3D's normal life span.

Navy Shifts CV To Pacific

Philippine Sea Leaves Atlantic Duty

The Navy is bolstering its depleted defenses in the Pacific area to the tune of two extra aircraft carriers.

The *Philippine Sea* will become flagship of Carrier Division One when it reports from the Atlantic for duty in the Pacific. The *Valley Forge*, flagship of CarDiv Three will relieve the *Boxer* on station in the western Pacific in May, according to Admiral Arthur W. Radford, Commander in Chief of the Pacific Fleet. The *Boxer*, flagship of CarDiv Five, will return to the West Coast.

CarDiv 15, the other carrier division of the Pacific Fleet consists of the escord carriers *Badoeng Strait* and *Sicily*. This summer the *Bataan* will join the fleet.

While in the Asiatic waters, the *Boxer* participated in a courtesy visit of the fleet to the newly-recognized state of Vietnam in March. Planes from the ship flew over several cities of the country in aerial parade.

Vietnam comprises the former French Indochinese states of Tonkin, Annam and Cochinchina. It was recognized by the U. S. on 7 February 1950.

Navy Ready For 1951 Year

Complete For Expected Budget

The Navy has completed its program of reducing ships and squadrons so that it "cut itself to size" several months before the new fiscal year begins 1 July of this year.

Only one air group remains to be eliminated; then its groups will total 8 instead of the 14 with which it began fiscal 1950. What size the Navy actually will be cannot be determined until Congress votes the money. Last year the funds were not appropriated for several months after 1 July so the Navy had to operate on a series of interim authorizations.

The 1951 program calls for large carriers to be reduced from 8 to 6, but the Navy has been given permission to keep one of those slated to be mothballed because the BB *Missouri* is to be retired from full time duty. Small carriers have been cut from 11 to 8 in anticipation of the 1951 budget and cruisers from 18 to 13. Patrol squadrons were cut from 30 to 20 to complete the cutback.

The Navy has a total of 652 ships and 4,389 planes in operating units, 2,182 in supporting activities and 1,184 in Naval Reserve units, or a total of 8,415 aircraft. Personnel have been cut to 386,064, the Marines to 74,437. Organized strength of the Navy and Marine Corps Reserves was increased 25,000 to a total of 256,000 to absorb some of the men being let out.

Lest We Forget! *On this Memorial Day, when we think a little about the squadrons, the aircraft carriers and the ace pilots who won the war in the Pacific, let's not forget the little guy. He played a part too, like this emaciated, dirty, tired little Marine mechanic, whose name nobody knows. He was the plane captain of a F4F Wildcat on Guadalcanal when we were fighting for our lives. He kept his plane flying for four different Marine pilots to shoot down 19 Japanese planes. He, and the little men like him, deserve a little recognition too on Memorial Day. They are the experts in their own way who help win wars.*

Electronics Trouble Shooters

LOOK AROUND your cockpit. You will find few instruments, if any, that do not have an electrical connection or depend upon electricity in some respect for their function. In fact, you might say the aircraft of today is as dependent on electronics to keep it in the air as it is on the engine and the wings of the plane.

The electricity, tubes and wire behind those switches, meters and panels serve every purpose from heating a pot of coffee to doing the complicated job of automatically computing a bomb release point. When some of that equipment ceases to function properly, anything can happen. Early in the war we found out what tragedies can come of such things. Most of us can remember the pilot who didn't get back because his ZB homing device didn't work or the plane that was shot down or fired upon by our own forces because his IFF failed.

Telemetering system on *Loon* guided missile gets final adjustments by C. P. Hedges, AD1, and NAESU Field Technician F. J. Paul at Point Mugu; *Loon* still lacks its flying wings

A vital need in every large organization depending upon such complex equipments is a group of highly skilled engineers and technicians who are on call at all times for trouble shooting assignments. As the use of special electronics equipment in fighting the war increased by leaps and bounds, the urgent need for such a group to aid not only in trouble shooting but in the installation, training and maintenance of this complicated gear became ever more apparent.

Out of this need was created the Airborne Coordinating Group (ACG) early in 1943, with headquarters at Naval Research Laboratory, Washington, D. C. Electronics engineers and technicians, both officer and civilian, were gathered in a pool, trained as specialists on equipments that indicated the most urgent need and were soon headed into the field. By early 1945, the number of technicians scattered throughout the various combat theatres was 215.

J. H. Phillips, AET2C, and Technician F. J. Paul work on missile at Pt. Mugu test center

In addition to lending assistance in the field, ACG was further assigned the job of keeping the Fleet informed on electronics maintenance by putting out a series of bulletins, notes and publications. It was a common occurence that the only information many maintenance technicians received on new equipments arriving at their squadrons was through one of these.

The four standard publications issued were *The Airborne Radio Maintenance Notes, The Airborne Radar Maintenance Bulletin, The Airborne Electrical Maintenance Notes* and the *Digest of Airborne Radio and Radar News.* With the termination of hostilities, all of these were consolidated into the *Digest of U.S. Naval Aviation Electronics* which is still being published as a technical, maintenance and operational electronics aid to naval aviation.

Shortly after the close of the war, the Airborne Coordinating Group was renamed the U.S. Naval Aviation Electronics Service Unit, (NAESU) and was retained in the post-war Navy as an important aid in solving difficult maintenance problems and as a means of bridging the gap that continually exists between the receipt of new airborne electronics equipments by the Fleet and their effective and coordinated employment.

The Naval Aviation Electronics Service Unit is under the direction of the commanding officer, LCdr. A. J. McEwan, USN, with LCdr. R. E. Bowen, USNR, as the executive officer.

The primary mission of NAESU has been recently restated in Aviation Circular Letter No. 94-49, dated 14 September 1949 and is quoted as follows: "The Naval Aviation Electronics Service Unit, hereinafter referred to as NAESU, is an organization established to provide technical assistance and instruction in the maintenance, repair and operation of electrical and electronic equipment to personnel of Naval aviation activities. It is under the management control of the Bureau of Aeronautics and is located at the Naval Receiving Station, Washington, D. C."

THE PART that this comparatively small group of electronics specialists plays in the continuing efficiency of the Fleet may be realized by those who understand the changes and rapid advances being made in electronic equipment. Unlike a static and settled field of knowledge where books, training and long experience produce a group of "old hands" in whom confidence can be placed, electronics is a growing changing field where the "old hand" is likely to be inexperienced in current methods, circuits and techniques, unless he is continually learning and keeping up-to-date.

One of the aims of NAESU is to assist men working in the Fleet in becoming familiar with new equipments and methods and to stimulate them to acquire greater knowledge. Their function is to provide fast and accurate technical assistance whenever called upon.

The Navy Electronics Officers and civilian personnel who make up the group of NAESU specialists can hardly call any place home. One day they may be at NAESU Headquarters, and two or three days later they will be shivering in the icy bleakness of Alaska or sweating on a hot and humid air field in Guam.

IN THE past, NAESU has been represented at *Project Loon, Project Canada, Project High Jump, Project Cross Roads, Project Musk Ox* and more recently *Operation Miki.*

Ten of these technicians, currently assigned to NATC PATUXENT RIVER, are working on Bureau of Aeronautics' project MA-302. The purpose of this project is to assemble material and devise a standard method for performing preflight test, flight test, bench check and line maintenance 30-, 60-, 120- and 240-hour check procedures for aircraft electronic equipment.

In another corner of the United States, a field engineer is aiding a pilotless aircraft and test evaluation projects at the Naval Air Missile Test Center, Point Mugu, California.

Further up the coast at Moffett Field, a technician is working with Composite Squadron Three, an all-weather squadron, where he is teaching special maintenance procedures and new circuits.

Far up in the Northwest corner of the United States at NAS WHIDBEY ISLAND, a technician is helping set up maintenance shops and checking out personnel in proper maintenance procedures. Soon he will be winging his way to Kodiak, Alaska, to carry out similar functions in that area.

At FAETULANT, another technician is assisting in revision of study courses, preparation of new study material and making up lesson plans for their Electronics Maintenance course.

Other things that have already been completed describe even further the broad field that is covered by NAESU technicians. In a recently completed project, assistance was furnished in the installation of prototype and flight test evaluation of the AN/AGA-1 Airborne Teletypewriter for JRM-1 aircraft of Transport Squadron Two. The tests were successful and good two-way teletype communications were experienced between air and ground during entire flights between Honolulu and San Francisco.

Technician Gilliland at Moffett field tells men about electrical system on a VC-3 F4U

In October 1949, the Commanding Officer of VC-5 requested the services of a NAESU technician to assist in the technical evaluation of a high-level bombing problem using an electronic bombing attachment and the MK 18 Bombsight Stabilizer. A technician who is specialized in electronic bombing equipment and techniques was ordered from Com Fair Alameda to assist in the project.

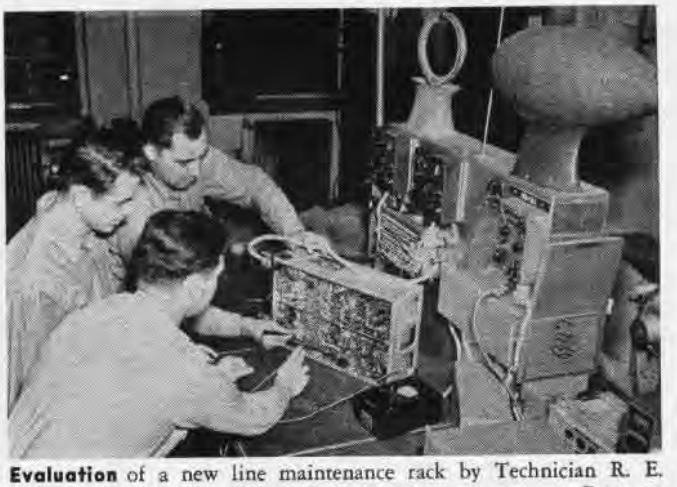
A few months ago, in a distant location, a NAESU field engineer helped to coordinate a joint United States-Canadian project *(Project Canada)* for developing a loran network in the frozen north. The outcome is intended to be a long stride toward safe air travel in the Arctic.

These are but a few of the jobs that are being done and have been done by NAESU technicians. The advent of new equipment and its use by Fleet units have been reflected in NAESU by repeated requests for technical assistance. The Headquarters unit carries on a constant training program to keep its engineers and technicians abreast of latest developments and to prepare them for new assignments, with a strong emphasis upon supplying aid as soon as it is asked for.

Skipper of NAESU, LCdr. A. J. McEwan, consults with Technician M. C. Turner in lab

The value to the Navy of an organization like the Naval Aviation Electronics Service Unit lies in its extreme adaptability. It can be called on for emergencies or for long-term specialists in any phase of electronics, for immediate-length duty or for projects demanding months of patient collection of data and facts. So successful has NAESU aid its parent ACG been in fulfilling the spirit of its mission that other nations have copied its organization. The British Royal Air Force, in a letter commending the part that ACG personnel and publications played in coordinating the Anglo-American electronics program, stated that it was establishing a similar organization.

Trouble shooting SCR-269-G radio compass at Olathe is done by R. S. Manny, FC3, and H. L. Fesmire, AL1, with technician's aid



Evaluation of a new line maintenance rack by Technician R. E. Patrie, E. J. Harvey, AT3 and C. O. Persons, AT3, at Patuxent

Wave 'Air Boots' in Reserve

RESERVE WAVES AT ANACOSTIA WATCH SEAMAN RECRUIT MADDEN 'TRY OUT' LINK TRAINER

A STREAMLINED program for the Naval Air Reserve's newest boots, the WAVE recruits, is now underway at most of the 27 stations and units in the Reserve chain. Already wing staff and squadron commanders are counting off the time when the new "seawomen" will take over regular Associated Volunteer billets.

Fifty-nine WAVE recruits are enrolled in the air boot course at NAS GROSSE ILE. They get four hours of instruction in the recruit syllabus each drill weekend and devote the balance of their time to in-service training. All have received specific rating symbols to guide their advancement path during the nine months course.

At NAS DENVER, 49 WAVES in Volunteer Composite Unit 9-38 (W) take recruit indoctrination each week. Training is conducted by WAVE officers attached to the unit with Denver stationkeepers giving the word on specialized aviation subjects. Upon completion of the training syllabi, slated for late spring, the majority of the recruits will be assigned as V-2's with Organized Reserve units.

The group's keen interest in military drill, conducted voluntarily by a Marine sergeant of the Denver Marine Air Detachment, carries over into such activities as basketball and choral singing. Playing in the Women's Division of the Municipal League, the WAVE basketball team placed first for the season. The WAVE chorus specializes on Navy songs.

The six-months WAVE boot course, started in January at NAS MINNEAPOLIS, has now settled down to a regular routine. Drilling, training, shots, scuttlebutt and all the other activities of the usual boot school are in full swing. One variation has been devised by a type training instructor particularly for the WAVES (it says here)—a perfume atomizer instead of a spray gun is used to illustrate the law, "as the speed of the fluid increases, the fluid pressure decreases."

A number of the WAVE recruits are Civil Service personnel at the station. Lt. Mildred Glendenning is in charge of the group.

The course is proving so successful that Minneapolis expects that the WAVE boot school will become a permanent fixture at the station.

A WAVE boot school is also a going concern at NAS SQUANTUM. This one is scheduled to last eight months and is on the usual non-pay basis. Approximately 30 WAVE recruits are enrolled.

The 21 WAVE boots at NARTU ANACOSTIA are getting their training by actually working on the job. This in-service training will be climaxed by a two-weeks cruise to be conducted aboard NAS PATUXENT RIVER under the supervision of the District and the NARTU training officers.

At NARTU MEMPHIS, the 15 WAVE recruits are receiving training similar to that of their "brother boots." Lt. I. M. Holland (W) is in charge of the instruction.

Elsewhere on the training front, instructor J. E. Pringle BM1 claims that the 12 WAVE boots at NAS DALLAS are outstanding students and NAS AKRON reports that its WAVE recruit program is still going strong.

Upon completion of the course at all stations, WAVES will be assigned to regular Associated billets with the wing staffs and squadrons on either a drill-pay or non-drill pay status.

Many of the new WAVE recruits are young women like Helen Turbeville of NAS DALLAS, who wanted to join the Navy during the war but were too young. As soon as enlistments in the Naval Air Reserve were reopened to women without previous military experience, they rushed to join up. SR Turbeville graduated from Polytechnic

LT. WALKER SWEARS SR WALKER INTO RESERVE

High School and attended TWC for two years. She is now employed as an office worker at Chance-Vought.

Some, such as Jeanne Degnan, Janet McBride, Virginia Madden, Gwendolyn Rodwell and Barbara Clark, who recently enlisted at NARTU ANACOSTIA, are "government girls." In the picture, they appear with a group of rated Waves who hold associated billets at the NARTU. From left to right they are: Link trainer instructor Abbie Wetzel; SR Madden; SR Degnan; Clare Nichols; SR McBride; SR Rodwell; Dorothy Powers; Elaine Linch; Sally Bossen; and SR Clark.

Typical of a few Wave recruits is Margaret Walker of NARTU MEMPHIS. She was sworn in by her husband, Lt. Harold Walker, Naval Academy graduate and fighter pilot, who is now electronics officer on Rear Admiral Martin's staff at Memphis. Aubrey Greenbaum of NARTU ANACOSTIA is another Wave air boot, who doubles

'JIGGS' WELCOMES NEW MARINE AIR RESERVISTS AT NARTU ANACOSTIA

NEW ORLEANS AA'S LINE UP WITH INSTRUCTORS BEFORE MIAMI HOP

as a Navy wife. Her husband, Lt. Leon Greenbaum, is a naval aviator with the Organized Reserve patrol squadron.

Barbara Ann Little, who enlisted in the Reserve in December 1949, is one of the first seaman recruits to be accepted for active duty as a stationkeeper. She is assigned to the type training department at NAS SQUANTUM, where she was the first enlisted Wave to report for full-time active duty.

These, of course, are only a few of the new WAVE seaman recruits, who are among the 645 enlisted women Air Reservists now training at Reserve stations throughout the nation.

NA News Aids NavCad Recruiting

To provide the latest information on new developments in naval aviation, copies of the NAVAL AVIATION NEWS are now being distributed regularly to 1830 senior and junior colleges throughout the country.

As a further spur to NavCad recruiting, 20 copies of the January issue were forwarded to each station and unit in the Naval Air Reserve Training Command for local distribution.

Several stations have reported that they are following up their distributions with visits and talks.

One report, in particular, from NARTU JACKSONVILLE is of special interest. It reads as follows:

"The special unrestricted issue of the NAVAL AVIATION NEWS was mailed out to nine fixed base operators in this area. It was requested that they inform this office of the reception that the magazine received from their students and visitors. The request was followed up by mail and by a personal visit to two of the flying schools. Believe me, that copy of *NavAirNews* looked like a six month old issue of *Esquire* does in a dentist's office. Every operator that was questioned begged to be included if such an issue should again become available for extra distribution."

NAS Seattle Goes Reserve in '51

By 1 January 1951, Naval Air Station, Seattle, will be transferred to the Naval Air Reserve Training Command, which now operates a NARTU at the station. This will bring the number of stations in the nationwide Reserve chain to 22 and reduce the NARTU'S to 5.

During the present calendar year, Regular Navy activities at the station, including operation of the overhaul and repair facility, will be reduced.

Regular Navy activities, which will continue to operate at NAS SEATTLE after its transfer, will include the dispensary and Fleet Weather Central.

Station Round-Up

● NARTU ANACOSTIA—When four of his high school friends joined the Marine Air Reserve at Anacostia, Private Frank H. E. Harris of VMF-321 brought along a descendent of the famed original Marine Corps mascot to witness their swearing-in.

In the picture, this descendent, by name of "Jiggs," takes center stage. Kneeling are Pvt. Harris and Pvt. James M. Prettyman, Jr., while in the second row are Pvt's John C. Rogerson, Mark C. Tennyson and W. C. Meier.

Pvt. Harris is the son of Colonel D. L. Harris, USMCR, who owns "Jiggs."

● NAS NEW ORLEANS—Nine O-2 airmen apprentices, who won out on a year-long competition with other AA groups, recently received, as their prize, a weekend trip to Miami. They were judged on drill attendance, recruits brought in, scores on tests, athletic competitions and target and skeet shooting. They are shown in the picture with their NAS instructors: back row AMC P. J. Casselberry (instructor), L. B. Callender, E. W. Hooper, A. C. Murphy Jr., W. H. Nicol, J. D. Crawford Jr., ADC J. S. Ostarly (instructor); front row, TD1 F. M. Follansbee (instructor), L. L. Bujol Jr., I. L. Cassanova, E. A. Jaeger Jr., and E. Camnetar, all are set for their Miami hop.

● NAS GLENVIEW—A record for long distance travel to attend a scheduled drill was established by LCdr. L. A. Nelson, CO of VR-722, who flew 5,000 miles from Shemya, Aleutian Islands, to participate in a weekend drill.

● NAS DALLAS—AVUA-5 at Oklahoma City, composed of all personnel formerly in VAU 8-4, was recently commissioned. Cdr. Bennie Turner is CO and LCdr. Massad is the exec. Planes will be ferried from the station to Oklahoma City once a month and will remain at Will Rogers Airport for a period of five days for AVUA flight operations. Office space and parking facilities are being furnished by the CAA at the flight development center located on the field. All of the CAA's latest training aids will be available to AVUA pilots. More than 80 officers and 30 enlisted Reservists are slated to join the unit.

● NAS AKRON—VP-651 participated in *Operation Birdseed*, sponsored by the Aero Game Feeding Club of Pennsylvania. This "operation" was planned as part of the flight syllabus and involved dropping wild game food over densely wooded sections where the wild fowl were having a hard time finding food because of the heavy snow.

● NAS LOS ALAMITOS—Organized Reserve squadrons conducted a simulated attack on the *Twining*, a Reserve destroyer on weekend cruise from Long Beach to San Diego, manned by an Organized Reserve Surface Battalion. The "target" was located, a surprise coordinated torpedo and bombing attack executed, and retirement effected with very small "losses" to antiaircraft fire.

● NAS BROOKLYN—More than 40 Reserve fighter pilots had flown the new *Phantom* jets as of 1 March—from Rear Admiral Luis de Florez with three decades of experience to the junior ensigns. In fact, so eager have the boys been to fly the new aircraft, that they have taken time off from business during the week to attend pre-jet classes.

● NAS OAKLAND—At the request of COM 12 operations office, several searches have been flown on weekends by Reservists to investigate reports of unidentified submarines off the West Coast. Fortunately the results of all the searches were negative.

66 NAVY ADMIRALS ARE PILOTS

EVER WONDER how many of the Navy's 285 admirals and commodores are aviators? A check of Bureau of Naval Personnel's flag rank list as of March 1 shows that out of that number 66 are fliers and nine assigned to aviation engineering duty only.

Top ranking naval aviator, of course, is Adm. Forrest P. Sherman, Chief of Naval Operations. The Number Two aviator is Adm. Arthur W. Radford, Commander-in-Chief of the Pacific fleet.

Vice Admirals who are aviators, and the positions they held as of March 1:

George D. Murray, Commander Western Sea Frontier.

John D. Price, VCNO, ordered to Chief of Naval Air Training, Pensacola.

Donald B. Duncan, Commander Second Fleet, ordered to DCNO (Operations).

Felix B. Stump, Commander Air Force, Atlantic fleet.

John W. Reeves, Chief of Naval Air Training, to be Inspector General.

Calvin T. Durgin, ordered as Commander First Fleet.

Thomas L. Sprague, Commander Air Force, Pacific, ComFirstFlt.

John J. Ballentine, Commander Sixth Fleet.

John H. Cassady, DCNO (Air).

Rear Admirals who are aviators, and the positions they held as of 1 March:

Alfred E. Montgomery, Commander Fleet Air, Jacksonville.

William K. Harrill, Chief of Staff & Deputy USN rep. military staff U.N. Ordered to General Board, Navy Dept.

Arthur C. Davis, Director, Joint Staff, JCS.

Frank D. Wagner, Commandant 17th ND, Alaska Sea Frontier.

Osborne B. Hardison, Naval Operations (Op-27).

Samuel P. Ginder, Chief, Naval Group American Mission for aid to Turkey.

Joseph J. Clark, Commander Carrier Division 4.

Henry S. Kendall, Naval Inspector General.

Clifton A. F. Sprague, Commander NAB, 11th, 12th ND. Ordered to Com 17ND and Alaska Sea Frontier.

George R. Henderson, Chief of Staff Naval Forces Eastern Atlantic and Mediterranean and Deputy CINCNELM.

Alfred M. Pride, Chief of Bureau of Aeronautics.

Malcolm F. Schoeffel, Commander CarDiv 4, ordered to NATC Patuxent.

Ralph A. Ofstie, member military liaison committee to Atomic Energy Commission.

Mathias B. Gardner, ACNO (Operations).

Marshall R. Greer, ComFairWing 2, ComFairHawaii.

Ralph E. Jennings, ordered as Chief, Military Assistance Advisory Group Norway.

Harold M. Martin, Chief NATTC Memphis.

Ernest W. Litch, Chief NAATC Corpus Christi.

John Perry, ComFairWings Pacific, ComFairWing 4 and ComFair Seattle.

Thomas S. Combs, ComCarDiv 42, ordered as Chief of Staff, CominchLant.

Frederick W. McMahon, Deputy Chief of Naval Personnel and Assistant Chief of BuPers.

Cato D. Glover, ComFairQuonset.

Austin K. Doyle, Chief Naval Air Reserve Training, Glenview.

Thomas H. Robbins, Jr., Joint Strategic Survey Committee, JCS.

William G. Tomlinson, Commander Pacific Division, MATS.

Richard F. Whitehead, Shore Establishment Survey Board, NavOp.

Daniel V. Gallery, Deputy Commander, OpDevFor, Atlantic.

Walter F. Boone, ComCarDiv 5.

Joseph F. Bolger, Staff, Cominch USNavFor Eastern Atlantic and Mediterranean.

Stuart H. Ingersoll, ACNO (Strategic plans).

Edward C. Ewen, ComNavFor Marianas, ComFairGuam and ComFairWing One.

Apollo Soucek, ACNO (Aviation Plans).

Robert P. McConnell, Member, General Board.

Wendell G. Switzer, ComCarDiv 16.

William L. Rees, ordered as ComCarDiv 2.

William D. Johnson, Assistant Chief, Bureau of Aeronautics.

Charles R. Brown, Deputy Director, Joint Military Advisory Group, London.

John M. Hoskins, Chief of Staff, ComAirPac.

Lucian A. Moebus, ACNO (Air).

Robert F. Hickey, ComFairWings Lant, ComFairWing 5.

Grover B. H. Hall, ACNO (Guided Missiles).

Herbert E. Regan, NavOp (Op-54).

Robert E. Blick, Jr., ComCarDiv 14.

John P. Whitney, Vice Commander, MATS.

Hugh H. Goodwin, Chief of Staff, Cominch Lant, ordered to Chief of Staff, Naval War College, Newport.

Edgar A. Cruise, Director, Air Warfare, OpNav.

Frank Akers, ComCarDiv 15.

Delbert S. Cornwell, Naval Attache, London.

Albert K. Morehouse, Chief of Staff, ComAirLant.

Herbert S. Duckworth, Air Force Air University, Montgomery, Ala.

Irving M. McQuiston, Advisor, Naval Air Reserve, OpNav.

The following fliers were on the latest promotion list for Rear Admiral:

Frank T. Ward, Jr. Chief of Staff, ComFairJacksonville.

Richard W. Ruble, Naval Aid to SecNav.

Stanhope C. Ring, Staff, National War College.

Charles F. Coe, Asst. Director, Air Warfare, OpNav.

Thomas B. Williamson, Naval Aide to SecDefense.

Aaron P. Storrs, III, Chief Naval Air Basic Training, Pensacola.

Admirals who are assigned to aviation engineering duty only are:

Donald Royce, BuAer General Representative, Eastern District.

Frederick W. Pennoyer, Commander, NAMC, Philadelphia.

Arthur C. Miles, BuAer General Representative, Western District.

Leslie C. Stevens, Joint Chiefs of Staff.

Navy Air Birthday Is May 8

First Curtiss Plane Bought in 1911

Naval Aviation celebrates its 39th birthday on May 8, but owing to the fact that Armed Forces Day comes later this month, no commemorative exercises for the day when it purchased its first airplane in 1911 are planned.

The Navy bought from Glenn L. Curtiss an eight-cylinder biplane called a *Triad*, capable of landing on the water or on land. It was fitted with engine panels and chassis and four interchangeable wing panels, covered with rubberized linen on top and tight-woven special sail cloth on the bottom.

One main pontoon and a pair of balancing hydroplanes with pontoons and hydro-surfaces enabled it to float on the water. Landing wheels had clincher tires, capable of being housed above or beneath the line of the main pontoon by the aviator during flight.

The plane had a metal-tipped propeller designed to push it through the air at 45 mph. It carried one passenger seated alongside the pilot, with double controls so that both could operate it if necessary.

In the accompanying photo, taken in 1912, is the Navy's first airplane. In the picture, left to right, were: Witmer, company pilot; Cooper, company pilot; Dr. A. F. Zahn, Lt. J. W. McCluskey, USMC (ret.); a Curtiss mechanic, Glenn L. Curtiss, Lt. T. G. Ellyson, Naval Aviator #1; Capt. W. I. Chambers, head of the Navy's aviation department; Lt. John H. Towers, Naval Aviator #3; Mr. Pickens, Curtiss company, and a company mechanic.

NAVY'S FIRST AIRPLANE, AN AMPHIBIAN CURTISS TRIAD, WITH GALAXY OF EARLY AVIATION MEN

Theodore C. Lonnquest, Deputy Chief of Bureau of Aeronautics.

Lucien M. Grant, BuAer General Representative, Central District.

Lloyd Harrison, Assistant Chief, Bureau of Aeronautics.

Calvin M. Bolster, Assistant Chief, Bureau of Aeronautics.

Paul E. Pihl, ACNO (Air Logistics).

Marines 'Initiate' Enemy

AF Pilot Captured In Portrex Landing

MAG-15, PUERTO RICO—When Air Force Lt. William R. Kimbro was "captured" by the Marines during *Operation Portrex* he was given the full Leatherneck treatment.

Kimbro's *Thunderjet* fighter made a forced landing at Roosevelt Roads. He was promptly picked up by an armed guard of Marines and marched off to intelligence center for interrogation, according to plan. He admitted he had "a sort of funny feeling" when he was captured.

MARINES MARCH PRISONER OFF TO YE OLD GAOL

Both plane and pilot became the subject of a jibing as only the Marines can do. Someone with a paint brush went to work on the fuselage of his shiny F-84, painting on it in foot-high letters "JOIN THE U. S. MARINES."

The pilot was allowed to depart, but not until after Vieques D-day. The final straw was when the pilot noted these words painted across his crash helmet: "Rejected—USMC."

Pamphlet Aids Transient

Memphis Gives Visitors The Word

NAS MEMPHIS—That lost feeling so familiar with transient pilots and crews soon will be gone at this station. Operations department is publishing a *General Information to Pilots* pamphlet by Lt. (jg) E. L. Whitlock, air traffic control officer.

The pamphlet contains information useful to a transient remaining on board a few hours or overnight. It describes berthing and messing facilities, transportation services available on and off the station, and has a map of the station. It answers the inevitable questions as to "where do we eat, where do we sleep, and what's doing around here in the way of entertainment?"

SNOW-COVERED NEPTUNES AT WHIDBEY ISLAND GAVE VP-6 MANY PROBLEMS TO 'KEEP 'EM FLYING'

VP-6 LICKS SNOW PROBLEMS

NAS WHIDBEY ISLAND—The armed services usually send squadrons to Alaska to study cold weather operations, but this past winter they would have all done well to move to this Puget Sound air station.

Extreme winter weather conditions gave VP-6 plenty of chance to do research into cold weather operation problems. Old-time citizens said it was the worst winter they ever had seen. The situation which tended to make the experience extremely realistic was the lack of adequate hangar space. Planes were forced to remain in the open weather, causing increased maintenance and operational problems.

Much valuable knowledge of cold weather flying was gained, no matter how unpleasant was the experience. Specific data compiled concerned use of wing covers, alcohol, pre-heaters and other methods of keeping planes in a ready status. Also, the number of man-hours expended and the equipment needed was noted.

Removal of snow and ice from the aircraft presented an extremely rough problem. This work involved many man-hours. It was found that while one solution provided the answer under certain climatic conditions, it might not work under others. Wing covers were effective if applied to dry surfaces when the temperature was below freezing. Otherwise, their application was of little benefit.

The average number of man-hours expended and the method found best suited for snow and ice removal from a P2V-2 type plane is as follows:

Ice and snow—Above freezing. Use of hot water under pressure—3 man-hours. Use of alcohol with brooms and squeegee—6 man-hours.

Dry snow on aircraft—Above freezing. Sweeping—3 man-hours.

Ice and snow—Below freezing. Use of wing covers and pre-heaters—6 man-hours. Without wing covers and pre-heaters using alcohol, brooms and squeegees—15 man-hours.

Safety being paramount, life lines were used in all snow removal operations. Parachute harnesses were worn by the men on the wings, and two lifelines were attached to the rings on the harness.

Whidbey Island compared its January winter weather with that at Kodiak and the Aleutian metropolis came off a second best, being warmer, less windy and having far less snow.

Kodiak Wind Shoves Tractor

VR-5 Pilot Has Hard Time In Alaska

VR-5, SEATTLE—Flat-landers who never have been in the Aleutians have a hard time to believe fantastic stories about the vicious winds which whip across those frigid Alaskan islands. The latest involves a plane and two tractors blown sideways on the runway by the wind.

An R4D landed at Kodiak in winds up to 50 knots. While taxiing, the pilot unlocked his tail wheel to turn down the taxiway to the hangar. Sharper winds turned the plane into an embankment causing major damage to the wing and nose section.

A tractor and cletrack were hooked up to the damaged plane to tow it to the hangar. The gusts got so strong they tore the port elevator from the plane, sheared the rivets between the elevator collar and elevator tube on the starboard elevator, even with control battens still in place.

At one point in the towing operation, the wind caused both towing vehicles and the plane to slide as one unit over several yards of the icy apron, inflicting several moments of terror in the hearts of the salvage personnel lest the plane and tractors be blown over the seawall. Brother, that's wind!

Miamians Fly Arctic Routes

Hurricane hunters from Miami, O'Neil, Gummo and Mason adjust the heaters that warm the engines of the their PB4Y-2 prior to starting; Herman Nelson heaters got plenty usage

VP-23, MIAMI—Six weeks of operations in Newfoundland and Greenland gave this hurricane-hunting squadron from the land of palm trees and warm sun some new ideas on cold weather operations.

Eight PB4Y-2's left Miami on 4 December, stopping at Patuxent River to draw heavy flight gear from FASRON 103. Immediately on arrival in Argentia, the squadron went through a program of ground training to check pilots and crewmen out on flying in the Arctic zone.

Movies on cold weather operations were shown, lectures given on oil dilution, propeller and plane anti-icing systems, high latitude navigation, ICA communication procedures and Arctic survival. Many flights were made to familiarize the pilots with the local area, as well as hops to Goose Bay, Labrador, and Narsarssuak, Greenland. The latter flights carried 5,000 pounds of mail and supplies to those outlying Air Force bases.

Hours flown for the months of December and January were 707, with 209 on instruments and 85 hours at night. Seventy practice GCA approaches were made.

Cold weather "know how" was soon accumulated first hand, especially when temperatures went down to 41° below zero at Goose Bay one night.

Near the close of the operation, squadron officers were requested to submit statements of their major difficulties encountered with possible solutions. Number one on the list of suggestions appeared to be clothing.

The heavy, fleece-lined leather flight gear which we had drawn in Patuxent was generally considered inadequate. At very cold temperature the leather tended to crack and in addition to being very cumbersome, it was not warm enough out of doors in high winds. Water repellant Parkas were suggested as a substitute with face masks or goggles included for wind protection. It appeared double-lined mittens were a must, and a suggestion for having boots with non-skid cleets inbedded in the soles was received.

Auxiliary power units ran a very close second on suggestions, even to the extent of advising a unit be carried in each aircraft because of the short supply encountered at the bases from which the squadron operated. Leaving the unit attached while starting all four engines was advised because of the necessity of keeping engine RPM low so as not to put so much pressure on oil lines. This is generally below the RPM at which the generators cut in.

At temperatures below 10°F, it was found that ground heaters were a necessity in addition to oil dilution. Here also it was found advisable to dilute until oil pressure dropped to one half that of normal idle RPM rather than rely too much upon the "time coldest expected temp" method.

At —20°F the props could not be pulled through without adding external heat even though the oil had been diluted quite long. Engine covers (nose hangar type) were suggested while applying external heat to the engine and are simply a necessity when men are working out doors on the engines.

Since the oil prop feathering lines congeals rapidly in below zero temperatures, it was suggested that the pilot not exercise the feathering circuit during run up prior to take-off, thus keeping the diluted oil in emergency

Navy finds pretty gals world over! Bulson, Buscher, Chamberlain, Lacey, Moore and Gordon use oranges, cocoanuts as lure

Miami was never like this, say Yoder, King, Falck, Demerast, O'Neil, an AF paratrooper, Gummo, Mason, McLaughlin of VP-23

without danger of rupturing a line in the engine.

Since there is such a low rate of evaporation in the priming system of the present PB4Y-2, one pilot suggested the engines be started in alternate air with a duct from a ground heater directing warm air into the alternate air inlet, thus providing a supply of dry warm air to the blower section to aid vaporization.

Kil-frost was found to be unsatisfactory at very low temperatures. It tended to congeal on the wings like wax. De-icer fluid proved more satisfactory. Because of trouble with moisture freezing in microphones, it was found that the thin rubber covers should be used on all "mikes."

As for navigation, loran was found to be quite good. The radio aids to navigation were good and Notams were up to date at all times. During actual navigation, the external lens of the drift meters frequently iced over, and it was considered a good idea to provide some means of heating that part of the instrument.

TWO NEW HELICOPTERS TO BE STUDIED BY NAVY

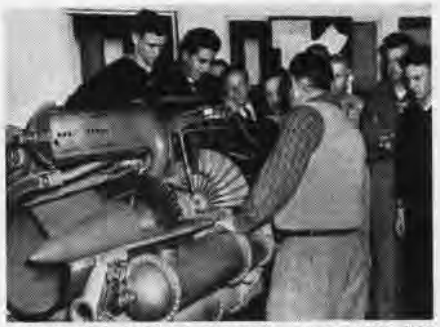
Navy Buys Two Helicopters

Two new helicopters have joined the Navy's stable of pinwheels.

BuAer has purchased three K-225 Kaman helicopters, a skeletonized version of which is shown above. One will go to the Coast Guard. The designation UH-12 was assigned the Hiller helicopter shown in a demonstration flight as it hovered over Reflecting Pool with the Washington monument forming a background.

The K-225 has side-by-side rotors with a 225-hp engine and 2,700 pound gross weight. The UH-12 has a single, two-bladed rotor with anti-torque tail rotor and 178 hp. Franklin engine. Gross weight is 2247 lbs, with three-man carrying capacity. The two new helicopters will be used for studies of their adaptability to Navy uses on land and sea.

Alamedans Learn About Jets



INSTRUCTOR THOMAS EXPLAINS JET ENGINE USE

NAS Alameda—It takes trained men to maintain jet engines, and this station is making sure it has a supply of them by maintaining a turbojet reaction engine school.

Originally at Livermore, the school at Alameda insures that trained civilian journeymen and enlisted aviation personnel are available for work on jets and kept abreast of rapid developments in the jet field.

The "related training" class is a general supplementary training program given after hours. Open to any civilian working on the station, as well as sailors, it was established in response to enthusiastic demand. More than 185 men here have completed the 80-hour lecture course on their own time, on their own initiative.

In these classes, emphasis is placed on history of jet power and theory, coupled with nomenclature and systems. Students attend two hours an evening, two sessions a week.

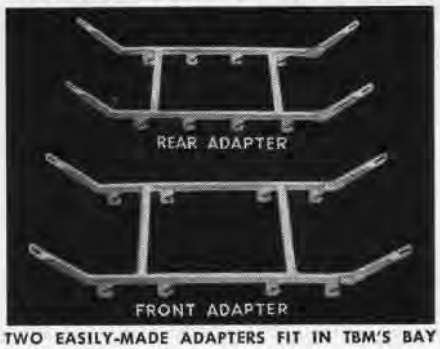
Primary mission of the reaction engine school, however, is to train men for work on jet aircraft. Graduates of this training will man ground crews and O&R shops on the station. Side by side with men from Alameda are students from Hamilton Field Air Force Base. These men will use their training as Air Force ground crews and instructors.

A full course which lasts for three weeks includes 120 hours of lecture and actual shop work. A prime example of the rapid pace of advancement in turbojets is the list of engines which have been used as a basis for classroom study. The JUMO 004, a captured German engine, was first. Then American-built engines followed —the I-16, J-30, J-32, J-34, J-33-A-23, J-33-48 and J-42. Present courses are given on Allison J-33 and J-35 and P&W J-42 engines.

The reaction engine school trains not only crewmen, but also many Navy and Marine pilots. It has been proved that the men flying new jets are better fliers if they have a full knowledge of the power potential and function of the airplanes they are handling. Recently at the request of ComFair Alameda, a large number of FASRon and Air Group personnel completed the course successfully.

The school is under the O&R department with Roy Williams as staff coordinator to direct it.

Shackle Boosts Sono Loading



TWO EASILY-MADE ADAPTERS FIT IN TBM'S BAY

VC-25—This squadron has developed two tubular adapters which increase the capacity of the TBM-3 bomb bay from six to 12 sonobuoys. This was found advantageous during *Operation Miki* in the Pacific.

The adapters were made from 1x.065" chrome-molybdenum steel tubing. The difference between the front and rear adapters is in the spacing of the hooks on which the bomb shackles hang. Approximately 25 man-hours were required to construct the two adapters. No special tools or fixtures are required since large tolerances are permissible.

12 SONOBUOYS CAN BE CARRIED WITH NEW IDEA

The front adapter is suspended between bomb stations 7 and 8. The rear adapter is suspended between bomb stations 9 and 11. Four Mk 8 shackles are hung from each adapter. There are 12 receptacles in the regular aircraft bomb release system, of which numbers 1, 2, 4, 5, 10 and 12 were used to actuate the six shackles employed in carrying the six sonobuoys for which the aircraft originally was configured.

Receptacles number 3, 6, 7, 8, 9 and 11 were used to actuate the six additional shackles employed when the aircraft carries 12 sonobuoys instead of six. Four sonobuoys do not hang on the adapters.

● NARTU Seattle—VMF-216 conducted a joint exercise with the local Naval Reserve Surface Unit, which operated a DE from Seattle to Victoria and return.

'Guppy' AD Wins Spurs

FLYING CHARACTERISTICS OF STRANGE LOOKING SKYRAIDER WORRIED VC-11 PILOTS AT FIRST

THIS STORY from VC-11 about its experiences with new airborne early warning AD-3W reads like a rags-to-riches story out of something an air-minded Horatio Alger might have written.

When the squadron received its guppy *Skyraiders* last August, there was a feeling of general disappointment. The squadron had been flying AD-3's and expected the 3W's to be similar. However, it was soon discovered that adding a radome, wing slats, auxiliary stabilizers and the omission of the landing gear doors not only slowed the plane down tremendously but changed considerably the flight characteristics.

Immediately it was noticed that there was no flare-out on a normal landing. When the throttle was cut for landing, the plane flew like a brick. If the height above the landing strip was too great, the right wing was likely to drop, causing an embarrassing situation.

From experiencing this situation and listening to subsequent rumors that the plane had vicious stall characteristics and was likely to stall and spin instantly at any speed below 100 knots, the pilots developed a variety of opinions, almost all adverse. So it is little wonder that there was considerable apprehension when field carrier landing practice was began. Then came the change.

Six pilots were scheduled for this practice in January 1950. Their average flight time was 2203 hours, with 32.8 hours in the AD-3W. They had made an average of 125 carrier landings each. They got two to four periods of FCLP in the AD-3 before taking on the AD-3W.

During FCLP it became apparent that owing to the tension spring on the stick control which caused a constant forward pressure on the stick, it was necessary to hold back pressure on the stick during the final approach as speed was reduced to landing speed regardless of tab setting.

Even with the elevator tab in the extreme nose-up position, back pressure on the stick still was necessary at speeds below 85 knots. It also was noted—and this too was attributed to the forward spring tension on the stick—that as soon as the plane hit the ground upon landing the tail had a strong tendency to leave the ground. Neither of the above notations are construed as discrepancies.

Latter periods of field carrier landing practice were flown with the plane in a simulated loaded condition. About 350 pounds of ballast was put in the radar operators' seats. Two 150-gallon external fuel tanks were mounted but not filled. This simulated loading tended to lessen the lightness of the tail and to increase the stability at approach speeds.

Carrier qualifications were conducted on the *Valley Forge* on 1 February. Ballast was left in the radar operator's compartment, but the external tanks were removed. Each pilot made eight landings with a wind varying from 26 to 33 knots. There was only one pilot-caused wave-off.

No difficulties, structural or otherwise, were encountered. Each pilot took a minimum of two catapult shots, some getting several more than two. No difficulties of any type were encountered. Free run takeoffs were made with a run of 360 to 420 feet, with no difficulties.

In general, pilots who qualified aboard were well pleased with the landing characteristics of the AD-3W. For a "dangerous monstrosity," it turned out to be the most stable, most comfortable and easiest aircraft to bring aboard of any plane ever landed by the qualifying pilots. This is a unanimous opinion.

It may be stated that the qualifying pilots of VC-11 were highly pleased, if possibly somewhat surprised, at the excellent characteristics of the AD-3W for carrier work and are looking forward to night qualifications as soon as a carrier becomes available.

New Metal for Jet Planes

Lighter jet engines are in the offing as a result of a new lightweight titanium alloy, as strong as high-strength steel and only half as heavy, developed by Bureau of Aeronautics.

The alloy is composed of 5% chromium, 3% aluminum and the rest titanium. It is highly resistant to corrosion and retains its basic properties at high temperatures, a vital point in jet aircraft. Other metals now in use, including aluminum and magnesium, do not have this property.

This new alloy will be used in turbine blades, tailpipe shrouds, engine firewalls and in the engine itself. Another good point is that titanium ores are available in the United States and Canada in large quantity, making the material basically non-critical and non-strategic.

Backfires May Give Trouble

Two recent airplane fires have been attributed to damaged alternate air doors permitting an induction system fire to flow into the accessory compartment. As a result, BuAer has issued TO 6-50 on the subject of backfires which should be read by all flying personnel.

Cases also have been reported of damaged alternate air doors preventing the selection of air when required to prevent carburetor or induction system icing. It also may cause engines to cut out owing to disruption of carburetor airflow.

Since the main cause of both damaged alternate air doors and induction system fires is the backfire, all pilots and ground check personnel should bear in mind the possibility of engine fire or future engine failure caused by a severe backfire.

Particular attention is directed to preflight inspection and functional check of alternate air doors and the induction system on all piston engine aircraft, to assure that no damage by backfire has occurred on the previous flight.

After any violent backfire during ground running, the engine shall be shut down immediately and the engine, accessory section and induction system visually inspected for damage prior to restarting. If backfire occurs in flight, ground check personnel should investigate prior to the next flight.

Plate Deflects Jet Blast

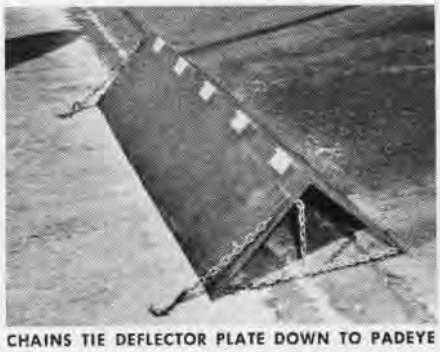
NAAS WHITING FIELD—Operation of F9F's at this field caused considerable erosion of the asphalt taxi lanes from the hot exhaust blasts directed down at the surface by the plane angle.

Over a three-month period, erosion in one spot extended 30′ across the taxi strip, was 5′ wide and extended to a depth of 3″ into the asphalt. Similar difficulty, but to a minor extent, has been experienced in the TO-1 parking area.

IRON PROTECTOR BEHIND PANTHER TURNS BLAST

To alleviate the difficulty, a series of tests was conducted on methods of deflecting the jet exhaust blast into the air. The simplest and most effective deflector is illustrated here. It consists of two sheets of ¼″ steel boiler plate, 18″x72″, joined by five heavy gauge 4″ butt hinges.

The hinges are riveted on the upper surface of the boiler plates with the upper edge of the rear plate bearing against the rear side of the front plate, thus providing continuous support for the entire length of the assembly. This was found essential to prevent vibration.



CHAINS TIE DEFLECTOR PLATE DOWN TO PADEYE

The plates were held at a 90° angle to each other by a chain at both ends, each of which is fitted with a snap to provide a means of collapsing the assembly so as to permit aircraft to taxi over it when not in use. The deflector is secured in place at the edge of the concrete by two short lengths of chain from the top of the assembly to pad eyes in the deck.

It is believed that this deflector will prove advantageous to all activities operating F9F and similar type aircraft. In view of its portability, it could be transferred with such aircraft to any command at which they might be based.

Carrier Fueling Is Problem

USS SALISBURY SOUND—The problem of refueling the carrier *Boxer* from this aircraft tender at Subic Bay proved difficult recently.

When the tender came alongside the carrier, the overhang was too great to permit mooring alongside. The catwalk aft projected outward toward the tender's port crane, and gun tubs aft. The catwalk and crane appeared to be only inches apart, with several feet separating the camels and fenders on the two ships.

It was decided to cast off and abandon the attempt to transfer fuel. Such a transfer could be made successfully if small tugs or barges were placed between the tender and carrier to act as camels. In this particular case this was not necessary since there was an AT vessel enroute to the Subic area which has sufficient aviation gasoline aboard for the *Boxer's* needs.

On the basis of this experience, it is recommended that where the AV-type vessel is to refuel a CV-9 class vessel that two camels of at least 30′ breadth be secured prior to approach. It will be necessary for the carrier to use its after fueling connections to receive the gasoline.

Gun Cleans Out Oil Sludge

NAF LITCHFIELD PARK—This plane preservation activity has found a way to combat carbon and sludge deposits which have blocked valve oil lines on R-1340 SNJ engines during periodic re-preservation runs.

Cleaning of tappet oil supply channels with compressed air or by steel wire is impossible, nor does the system clear itself during prolonged ground run of the engine.

To meet the problem, equipment shown in the photo was developed. A salvaged push rod was cut off to a length of 6″ and a standard 45° Zerk fitting was threaded into the open end. A standard Zerk gun, hand or electric, serviced with 1100 oil, completed the outfit.

THIS LITTLE GUN CLEARS PLUGGED UP TUBING

In application, the push rod is removed and the ball end of the adapter is placed in the socket of the faulty tappet assembly. One man holds the adapter, another applies pressure oil to the Zerk fitting. The propeller is rocked through sufficient arc to insure alignment between the oil passages in the tappet and those in the tappet guide in the engine.

VP-74 and VF-22, Hear This

The historical sketches of these two squadrons are ready to run once we have pictures of squadron members and actions. If you have some photographs, please let us use them. They will be returned to you in good condition. Send them to Naval Aviation News, Chief of Naval Operations, Navy Department, Washington 25, D.C.

New Bomb Rack Safety Pin

VA-15, ATLANTIC—An additional means of safetying radar bombs in Mk 51 racks to prevent inadvertent release by use of the emergency bomb release has been developed by Ens. William F. Fraser.

Finding the 1/32″ safety margin of the presently-used safety pin unsufficent, a ½″x1-15/32″ AN 398-47 flat head pin was inserted in the ground check safety hole on the bomb rack. The pin must be modified by filing off 1/16″ along the length of the shank. Slight errors in tolerance will not affect the safety of the rack as it does when using the standard safety pin.

Trio Wins Aircrew Wings

FAWTUPAC—This all weather training unit is one of the few places in the Navy where the coveted combat aircrewmen wings can be earned.

During a recent captain's inspection, Ralph J. Creamer, ALAN; Darrell W. Johnston, AL3, and Peter R. Muller, AT3, were given their wings by Capt. Frank Turner. They had passed several months of intensive training in safety, survival, familiarization with aircraft electronics, communications, ordnance, recognition, navigation and aerology.

The flight training emphasizes teamwork between pilot and aircrewmen and consists of search, intercept, bombing, gunnery and navigation flights during low visibility conditions. The modern aircrewmen must meet higher standards than have ever before been required.

CAPT. TURNER PRESENTS WINGS TO GRADUATES

SERVICE Test INTERIM REPORT DIGEST

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

F2H-1 (361 Hours)

Port Engine. The port engine has reached a total of 250 operating hours and will be operated to 300 hours if possible. Cracked blades in the first stage turbine were found during the last three engine checks. The operating time on the starboard engine, which has reached 150 hours, has been extended to 200 hours by BUAER.

A routine inspection after 226 hours of operation of the port engine revealed a 3/16" crack on the inner half of the trailing edge of a first stage turbine blade. *Recommendation:* Return the blade to the contractor for investigation.

F9F-2 (423 Hours)

Operating Time. The operating time on the J42-P-4 engine reached 150 hours. Permission was granted by BUAER to extend the time on this engine 65 hours in order to complete the present 450-hour BIS trials on the airplane. Upon completion of the 450 hours, the airframe will be modified and a J42-P-8 engine installed.

Oxygen Check Valve. Four high pressure oxygen check valves have failed. These are ball check valves that have a brass base and cap. When first installed, the valves permit a small amount of leakage, but as the cap wears and loosens, the rate of leakage increases. The valves were changed when the leakage caused a drop in pressure of 900 psi in a 12-hour period.

P4M-1 (42 Hours)

All P4M aircraft were grounded by BuAer pending investigation of an engine mount failure. This ruling was later modified to allow one flight of all P4M aircraft back to the G. L. Martin Factory. BU.NO. 122207 was flown to the factory the middle of March and will be returned about the first of June after the incorporation of all outstanding factory changes.

Cabin Heater. Investigation of a failure of the cabin heater revealed that the Stewart-Warner vibrator in the ignition unit was inoperative after a total operating time of 6.5 hours. It was also revealed that the lead to the coil of the fuel valve solenoid was broken after a total operating time of 6.3 hours.

Hydraulic Pump. There was no pressure in the main hydraulic system with only the starboard engine operating. Investigation revealed that the drive shaft of the hydraulic pump was sheared. Since only a system pressure gage is supplied, it is not possible to detect the failure of a hydraulic pump when both engines are running. A pressure gage should be provided for each engine-driven hydraulic pump.

Recommendations: (1) Investigate and correct cause for the failure. (2) Provide pressure gages for each hydraulic pump.

Plastic Shield. The plastic shield located on the port side of the radar countermeasures compartment was broken. Because of its exposed position in the passageway, the shield would undoubtedly be broken frequently during squadron operations. The original .116" plexiglass shield was replaced by a shield .156" thick, and an additional brace was installed to give better support.

Alternators. The NO. 1 and NO. 2 alternators failed during flight. Investigation revealed that the drive shafts of the two alternators had sheared. The rotors of each alternator turned freely. The total load on the electrical system did not exceed 400 amperes. The alternators have been delivered to the Martin representative in exchange for two new ones.

Discrepancies under Investigation:

1. Failure of the drive shaft on the hydraulic pump on NO. 1 engine (two cases).
2. Failure of the port propeller; three of the four blades were found to be out of balance.
3. Failure of five rivets in the port propeller nose spinner shield assembly.
4. Looseness between the collar and lower sleeve of the radar countermeasures antenna (AT 130).
5. Excessive smoke in the after station of the aircraft during firing of the tail turret.
6. The failure of the coaming on the countermeasure escape hatch.
7. The inadequacy of the arm rests attached to the pilot seats.
8. Improper installation of an electronic tube in the radar position scope.
9. Failure of the low pressure hydraulic tube assembly on the starboard (gear up) brake system (two cases).
10. Failure of spacer lugs on the forward end of the center jet door assembly.

AD-4 (240 Hours)

The flow check by the Aeronautical Engineering Laboratory of the PR58U1 carburetor disclosed that the lean poppet valve and automatic mixture control settings required readjustment. When the carburetor was reinstalled on the aircraft, roughness was again encountered in the high power range. Fifteen arrested landings and 15 catapult takeoffs were made. The APS-19A radar failed again during the arrested landings. Flight Test will use the airplane to perform qualitative stability and control tests.

Sliding Enclosure. The forward frame of the sliding enclosure assembly cracked at the fifth attachment hole from the right hand side. The glass assembly (acrylic plastic) cracked at the ninth attachment hole from the right hand side, and cracks were starting to form at two additional places.

Brake Power Boost Cylinder. Investigation of erratic brake operation disclosed that the cap assembly slides in the upper chambers of the brake power boost cylinders were binding in the slide housings. Metal slivers and chips were found between the cap assembly slides and the slide housings. It is believed that the metal particles resulted from movements of the slide retainer rings in the ring grooves. The grooves were scored, and metal slivers could be dislodged by rotating the retainer rings.

Recommendations: (1) Redesign the slide in the master brake cap assembly to eliminate the requirement for the retainer ring. (2) Return the brake power boost cylinders to the container for corrective action.

APS-19A Blower Motor. Investigation of unsatisfactory radar operation disclosed that the blower motor and the magnetron tube had failed. It is believed that the failure of the magnetron tube was due to the lack of cooling normally furnished by the blower. Inspection of the blower motor revealed that the commutator end bearing was broken.

Exhaust Stack Clamp. The exhaust stack clamp that supports NO. 10 exhaust stack broke. This is the first failure of this clamp during 225 hours of operation.

Monitor Bus Pilot Relay. Investigation of the failure of the port generator warning light to operate when the output of the generator was not sufficient to operate the reverse current relay, disclosed that the monitor bus pilot relay had failed internally. This relay is a sealed unit, and no attempt was made to determine the cause of the failure. *Recommendation:* Return the relay to the contractor for correction.

Cockpit Heater. The cockpit heater duct coupling assembly, which connects the exhaust stack heater muff to the carburetor air scoop, failed on two occasions. A failure of this assembly installed in an AD-2 airplane has also been reported. *Recommendation:* Provide a satisfactory cockpit heater duct coupling assembly.

Propeller Control Assembly. During a routine flight, the male end of the rod assembly separated from the quick disconnect fitting. Although there was evidence of wear on the male end of the rod assembly, it is believed that the failure resulted from excessive wear in the quick disconnect fitting. The spring loaded sleeve provided insufficient compression on the fingers to compensate for the wear in the quick disconnect. Similar failures occurred during the accelerated service test of the AD-2 and were reported.

Recommendations: (1) Provide a satisfactory quick disconnect fitting. (2) Return the quick disconnect fitting to the contractor for investigation.

F2H-2 (18 Hours)

Fuel Control. This project has been delayed because of difficulties encountered in fuel control. The failure of the port engine after 18 hours necessitated an engine change. Since the engine change, the plane has not been flown because normal procedures have failed to start either engine. This aircraft is being operated on AN-F-58 (JP-3) fuel. It is believed that the difficulty in starting is caused by the use of AN-F-58 fuel, the low ambient temperature, and the inability to control satisfactorily the starting fuel flow of the R-46 Holley fuel governor. Both Westinghouse and Holley representatives have been consulted and the investigation is continuing.

Power Plug Receptacle. An electrical fire that resulted in partial destruction of the external power plug receptacle occurred during a ground starting cycle. Investigation revealed that steel lock washers are used in the receptacle assembly. It is believed that the high resistance of these steel lock washers caused sufficient heat to be generated at the negative contact to cause this failure. *Recommendation:* Provide a satisfactory receptacle assembly.

AM-1 (191 Hours)

Fifty arrested landings and 25 catapulted take-offs were performed with no difficulties. Prior to making the arrested landings, Service Change NO. 102 was incorporated.

Exhaust Clamp. After 164 hours service test evaluation time, the clamp which connects the 6D header assembly to the 6B header assembly failed.

Auxiliary Fuel Pump (Delco). Investigation of the failure of the auxiliary fuel booster pump revealed that the armature of the booster pump electric motor was burned out.

Attitude Gyro Indicator. After 159 hours service test evaluation time, the attitude gyro in level flight indicated 3° right wing down.

Electrical Tubing Assembly. After 178 hours service test evaluation, the electrical tubing assemblies to the outer wing panels caught between the upper skin surfaces of the center and outer wing panels when the wings were spread. As remedial action, interim fix of clamp and bungee cord has been installed. *Recommendation:* Reroute the tubing assemblies to eliminate the unsatisfactory condition described.

Under Investigation. Wing flap and dive brake control—the landing flaps could not be actuated after 191 hours. Exhaust coupling failures are also being investigated.

UF-1 (35 Hours)

UF-1, Bu. No. 124375, was received on 17 February 1950. The acceptance check was completed, and the flight test phase of the trials began on 24 February.

Discrepancies:

1. Anti-icing elements, propeller.
2. Carpeting, cabin deck.
3. Hydraulic reservoir, location of.
4. Fitting, wing flap hydraulic system.

P2V-4 (28 Hours)

P2V-4, Bu. No. 124214, was received on 6 March. An acceptance check was completed, and the flight test phase of the trials has commenced.

Azimuth Finder Spots Stars

VR-6, WESTOVER—In this squadron, the guy named George of "Let George do it" fame, is the poor benighted navigator. When the plane is late taking off, when the fat lady loses her appetite between Rhein-Main and Lagens, somehow, George is at fault.

He failed to get the flight plan filled out on time, or he steered the pilot right through a thunderhead. And brother, when a longer form is invented, George will fill it out.

But now something has been done for the navigator. And who did it? George, himself. The boon to navigators, devised by Lt. (jg) George L. Miller, VR-6's assistant navigation officer, is a little gimmick lovingly called the azimuth finder.

The finder's sole mission in life is to make the navigator's task of locating navigation stars a little easier. It is a six-inch aluminum disc with a compass rose stamped in units of 10 on the outer edge. The degrees from zero to 360 are graduated in a counter-clockwise direction. A half-inch hole in the center of the disc is used to mount the gadget face

MILLER'S DEVICE HANDY AID TO NAVIGATORS

down in the astrodome, between the octant hook and the dome itself. The mounting screw on the octant hook is sufficiently long to accommodate the azimuth finder without alteration.

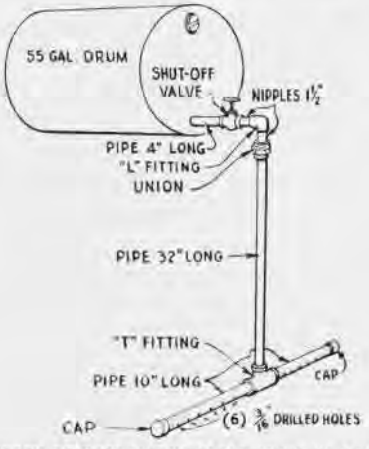
Installed loosely enough to allow rotation, the true heading of the aircraft is set on the finder co-incident with the plane's lubber line. Now, when the octant is lined up with the bearing on the finder, which the HO-249 says is correct, the celestial body leaps into view like a politician the day before election.

● NAS MINNEAPOLIS—A station RID, which was at Bemidji, recently rushed a pregnant woman, who had contacted polio, to the University of Minnesota hospital for needed emergency treatment. The baby has now arrived and is hale and hearty.

Dye Marker Defeats Runway Snow

NAS WHIDBEY ISLAND—A system of marking runways during periods of heavy snowfall was developed by this station during the cold weather which swept Puget Sound last January.

Falling snow quickly obliterates the outline of the runways and cross-country landings are a little hard on oleos and tires. This station developed a sprinkler drum which did the trick. Contents of two life vest dye marker packets were dissolved in a gallon of water and poured into the drum. It was then filled with water and the filler plug loosely replaced to provide for venting.



WHIDBEY DEVICES MARKS CLEAR LINES IN SNOW

In the event of very low temperatures, salt, alcohol or anti-freeze as available, should be added to prevent freezing. However, the freezing point should be maintained higher than the outside air temperature to preclude melting a groove in the snow as the marking fluid is applied.

The drum is cradled in any suitable vehicle so the sprinkler pipe rides about a foot above the runway surface. The car drives down the center of the runway or on either side, adjusting the rate of flow in accordance with the car's speed. One drum of solution will lay a stripe about 5,000 feet long. A stripe about two feet wide will be produced, of bright orange color on snow-covered surfaces or yellowish-green color on iced surfaces.

Persistency is practically unlimited and the stripe will remain visible until covered by fresh snow or until the snow or ice disappears by melting. The marking is distinguishable readily from 2,000 feet, and visibility is excellent from any point in the landing pattern and throughout the approach.

AVIATION ORDNANCE

Excessive Lubrication?

VMF-122 recently submitted a RUDM to BuAer reporting failure of the APX-1 radio equipment in FH-1 aircraft. Failure was caused by oil dripping from the guns.

BuOrd *Comment:* It is believed that the difficulty experienced by VMF-122 resulted from the use of an excessive amount of lubricating oil.

Recommendation: BuOrd recommends that lubricating oil be applied to gun parts by wiping with a clean lint free cloth that has been saturated with oil and wrung dry. Firing experience has indicated that the 20mm Automatic Gun M3 should be cleaned and lubricated daily after firing, and after firing each 600 rounds when more rounds are to be fired during the same day. If possible, clean and lubricate the gun more frequently. *Oil* JAN-L-644 *(formerly* OS 1361) *is the only lubricant recommended for aircraft guns.*

A new Ordnance publication, OP 1828, entitled "Cleaning, Lubrication and Preservation of Aircraft Guns," is being printed and will be distributed shortly. The purpose of this publication is to assist squadron ordnance personnel with problems related to cleaning, lubrication and interim preservation of aircraft guns.

Hold OMI V6-49 for O.K.

NavOrd OMI V6-49, entitled "Modification of Rear Buffer Housing 20mm Automatic Guns M3 and AN-M2," was issued to provide instructions for assembling an improved lock plunger to the buffer housing. Lock Plunger, Part #A7229174, Stock #J941-P-9590-52, was provided as a replacement for Lock Plunger A25564, originally assembled to the buffer housing.

NAS Alameda informed BuOrd that the steel used to manufacture Lock Plungers A7229174 exceeded the hardness specified on the manufacturing drawing. Proper swaging of the plunger shaft, required for retaining Collar A7229939, could not be accomplished.

In view of the unsatisfactory condition reported by NAS Alameda, BuOrd requests that *compliance with* NavOrd OMI V6-49 *be withheld* pending an investigation of the physical characteristics of the part. Information concerning the status of Lock Plunger A7229174, Stock #J941-P-9590-52, will be disseminated in the near future.

Redesigned Relays Ready

As a result of unsatisfactory operation of Relay Mk 4 Mod 1 (August 1949 issue of Naval Aviation News) caused by shock mount failure, a new relay eliminating external shock mount provisions has been designed. This relay has been designated as Relay Mk 4 Mod 2. When equipped with a mounting plate, this relay is mechanically and electrically interchangeable with Relay Mk 4 Mod 1.

NEW RELAYS ARE BEING DISTRIBUTED TO FLEET

Improved Features: In addition to an improved mounting arrangement, a new and novel means of providing accessibility to the three trim potentiometers is provided. To permit adjustment the entire cover need not be removed; a small disc mounted on the face of the relay provides access. This new disc has a short length of chain attached to prevent its becoming lost from the relay.

Distribution: The new relays are being distributed for fleet use, and it is expected that eventually all *Skyraider* (AD) and *Mauler* (AM) aircraft will be retroactively equipped during overhaul. However, fleet activities are cautioned not to requisition the newer relays for wholesale field replacement as relatively small quantities will be available. As far as practicable, even distribution will be made throughout the fleet.

The Relay Mk 4 Mod 2 will be carried in the aviation ordnance supply system under stock number J942-R-463-60.

M-24 Gun in Service Soon

A new aircraft gun will be in service shortly. The 20mm Automatic Gun M24 is being installed in the bow and tail turrets of P2V-4 production aircraft.

The M24 is a combination blowback and gas-operated weapon designed to fire electric primed ammunition. This air-cooled gun has a minimum cyclic rate of fire of 700 rounds a minute. Ammunition is fed into the gun from either left or right side with the standard 20mm Feed Mechanism AN-M2. In operation, the functioning of the weapon is very similar to the 20mm Automatic Gun M3.

Differences: Basically, the difference between the 20 mm Automatic Gun M3 and M24 are as follows: The M3 fires percussion-primed ammunition, ceases fire with breechblock assembly held to the rear by a sear mechanism, and the sear mechanism is actuated by an electric trigger control. The M24 fires electric-primed ammunition, and in multiple gun installations, guns can be timed to fire in or out of phase. It ceases fire with breechblock assembly in battery.

Turret guns will be timed to fire in phase by using the Mk 1 Mod 0 Synchronizing Switch which was fully described in the April 1950 issue of the Naval Aviation News. Fixed guns will employ the switch which is assembled to the left side of the receiver, but will not be synchronized.

Standard Stock: Guns are carried in standard Navy stock under Stock No. J941-G-5599-225. Synchronizing Switches, Stock No. J941-S-23471, are assembled for mounting to the right side of the gun receiver. Switches, Stock No. J941-S-23471-5, are assembled for mounting to the left side of the gun. Guns, Stock No. J941-G-5599-226, are packaged without the switch.

Spare Guns: Spare guns, synchronizing switches, and maintenance equipment allowed to activities assigned P2V-4 aircraft will be incorporated in aircraft model lists, *Aviation Ordnance Allowances,* NavOrd List 20870, Rev. G. This list is being prepared.

Maintenance Spare Parts and Tools: NavOrd Lists 22954 and 22959 list spare parts and special tools issued to operating activities maintaining the gun. These lists are in the new catalog, *Line Maintenance and Tool Sets for Aviation Ordance Equipment,* published as NavOrd List 21416, Revision B, dated 1 November 1949.

Publications: Department of the Army Technical Manual 9-232 contains instructions for the identification, use and care of the 20 mm Automatic Gun M24. Copies of TM 9-232 are available for issue and may be requisitioned in accordance with the instructions contained in the Index of Ordnance Publications, OP-0.

Activities requiring additional information should address all inquiries to the Bureau of Ordnance.

Homing Gear Saves AF Men

NAF Chincoteague — A lost Air Force plane and a newly-installed VHF/DF homing device were combined for a dramatic night "save" here on the night of 22 February.

With only 15 minutes of fuel left, the B-25, on flight from Carswell AFB Texas to Langley AFB Virginia, reported it was lost somewhere near Richmond. An alert tower watch at Chincoteague heard the "Mayday" and directed the plane to the field in a matter of nine minutes, where a safe landing was made. Rain and low visibility conditions existed throughout the area.

Only a few days prior to this incident, tower personnel had completed a check-out in operation of the VHF/DF gear. On duty in the tower at the time of the emergency were Lt. William G. Horton and William L. Smith, AC3.

SUPPLY NEWS
FROM ASO AND SUPPLY DIVISION BUAER

Efficient Ordering Needed

Several years ago, a write-up covering the subject of efficient requisitioning was published in this column. Because of the turnover in military personnel and the modifications of supply procedures, these revised instructions are appropriate at this time.

Ordering aircraft spare parts and assemblies can be accomplished speedily and efficiently when the ordering activities know *what* is needed, the *correct* part or stock number, *whether* the part is supplied by ASO, and *how much* of the material is required.

- *Be sure of what you need.* Order the smallest component part of an assembly or installation that will fill your requirements. When the component part is not available, the supplying activity will fill your requisition with the next larger assembly containing the required part.
- *Be sure you have the correct stock or part number.* After determining the part or assembly required, consult the Aviation Supply Office Catalog, ASO Catalog Change Bulletin, Interchangeability Lists, Allowance Lists, or Illustrated Parts Catalogs. These publications will be an invaluable aid in identifying correct stock and part numbers. Study the forewords of these publications for clear-cut instructions in their proper use.
- *Check to ascertain if the part is procured and stocked.* Items listed in Allowance Lists, QSSR's, ASO Catalogs are procured and stocked in the aviation supply system. In the Illustrated Parts Catalog, items coded "P" and "PI" are procured items and stocked. Items coded "M," "M-1," "X" or "X-1" have not been purchased and consequently are not supplied by ASO and *should not* be requisitioned. (Order next higher assembly or make items.) All personnel concerned with the ordering of aircraft spare parts should thoroughly familiarize themselves with the contents of Aviation Circular Letter No. 128-44 which explains source code symbols.
- *Limit requisitions to fill actual needs or allowances.* Ordering excessive quantities of material often fouls up the aviation supply system by creating communication and shipment backlogs. For example, assume a squadron orders 600% replacement of an item. Such an issue could very possibly deplete stock at the supply point, thereby causing delay in filling requests for other activities having a legitimate need for the item. This would cause unnecessary emergency procurements with resultant dispatches and air shipment to meet the deadline delivery date. In the meantime, airplanes are grounded waiting for the part.

The supply point orders on the basis of its past issues, and similarly, the parent supply activity and the distribution point are re-stocked on this basis. This means additional procurement at all three supply points if the Aviation Supply Depot is asked to fill an artificial need. The result is excess stock which eventually must be reported and redistributed with a consequent increase in paper work, packing and shipping.

All this can be avoided if the squadron limits its request to actual immediate needs, plus the quantity required to fill their allowance. If quantities in excess of established allowances are required, they should be justified by an explanation of the need, and very probably an RUDM should be submitted. (In this connection, study the provisions of ASO C/L 155A.) This is very important, because through RUDM's, BuAer is able to take corrective action if a part has proved unsatisfactory.

Supply activities are responsible for proper handling of requests submitted by dependents. This includes screening of requests against allowance lists; questioning excessive requests which are not justified; determining whether or not the item is procured before passing to another supply activity; substituting interchangeable or replaceable items; supplying next larger assemblies where practicable; rationing items in short supply; and screening dependents' stocks for excesses before passing a request to another supply activity.

In certain categories of aviation material, specialized ordering instructions are published in the foreword of the respective ASO catalog sections. *Study the forewords.*

By constantly keeping the points outlined above in mind, activities will increase the efficiency of the aviation supply system.

Attention Supply Officers!

BuOrd is still receiving numerous requests for supply and disposition of *Bomb and Torpedo Handling Equipment, Smoke Screen Equipment, Tow Target Equipment,* and certain machine gun accessories. These requests should *not* be submitted to BuOrd.

BuOrd - BuAer joint circular letters (NavOrd OCL V1-46 – ACL 24-46 and OCL V3-46 – ACL 111-46) transferred cognizance of this equipment from BuOrd to BuAer. Requests should be directed to BuAer.

Aeronautical Letter Out

A joint BuOrd, BuAer, BuSandA and ONR circular letter concerning the disposition and handling of salvaged, exchanged, returned and over-age aeronautical material, including aviation ordnance equipment and aviation ordnance special devices, is being distributed to the fleet. The BuOrd designation is NavOrd OCL V1-50. This circular letter supersedes OCL V1-48.

New Supply Publications

A provisioning brochure which outlines the *why's* and *wherefore's* of spare parts provisioning is being prepared by ASO and will soon be distributed to all interested personnel.

A listing of spare parts for Class 93 training devices is currently being published in the Aviation Standard Materials Technical Supply Bulletins.

If additional copies of either of these publications are required, submit requests to the Aviation Supply Office, 700 Robbins Avenue, Philadelphia 11, Pa. Attention SC3-1.

'JET WAVEOFF' OR 'SLIGHTLY BURNED UP'

Wrench Solves F2H Problem

VMF-122, Cherry Point—This squadron has developed a time-saving idea which may help other squadrons in maintaining their jet engines.

When the new *Banshees* went into their first engine checks, a bottleneck developed. This delay was due to the inaccessibility of the tightening nuts on all outlet and inlet oil lines of the J-34 engine.

Mechanics found that all available wrenches did not have sufficient clearance to make loosening these nuts the small task it should be. The result was an extra 10 to 15 minutes to each engine check.

Finally, the plain "bicycle" wrench answered the problem. Mechanics found by filing the heads off these wrenches they obtained the clearance necessary to gain easy access to the oil line fittings. It was found that about ½" of the head of the wrench had to be filed off. The squadron presents this jury rig as a temporary solution, but still looks for an open end wrench the proper size and type that will keep these fittings from unnecessary wear caused by slipping tools. Others may find it useful.

LETTERS

SIRS:

I enjoyed your article titled Patrol Squadron Eleven and truly believe it was not only well written, but gave well deserved credit to a fine bunch of men!

Having been a member of VP-11 for over two years, and having gone through quite a fabulous series of experiences with this squadron, I was very much disappointed to see that whoever wrote the article completely by-passed all of this with a short mention of "a tradition of airborne warriors who had from Pearl Harbor through the Guadalcanal operations steadily taken part in patrol coverage and fought back in the early stages of the war."

The men mentioned in this sentence had been shot down, had made daylight and night torpedo and bombing attacks, played "Louie the Louse" over Japanese lines night and day, rescued numerous Army and Navy people (many from behind enemy lines).

I believe that the first real offensive use of the *Catalina* in all types of warfare was pioneered by the original VP-11 men under the most able command of Capt. C. C. Marcy, USN, and that in order that the whole record be kept, this story ought to be told.

CHARLES F. WILLIS, JR.
LT. CDR., USNR

JAMAICA, N.Y.

¶ In writing the story of VP-11, we regretted that we had to speak so briefly of its valiant predecessor. While we knew that the earlier squadron had made a fine record, we had no details. Many squadrons have failed to deposit a narrative of their tours with Aviation History, DCNO (Air), so we are at a loss to publish any accurate account of their accomplishment. This is true of the first tour of VP-11.

SIRS:

In reference to the article titled "Helicopter Drops Life Raft" in your March issue, I am enclosing a photo showing an almost identical quick release rig installed on a Bell helicopter.

It was stated in your article that the Marines at Quantico "developed" this quick release for the HO3S-1 helicopter. I think the correct term in this case should be "adapted" since the original development and test work on this quick release installation was conducted in 1947 by HU-2 as Lakehurst.

A copy of the enclosed picture hung in the HU-2 ready room since approximately August 1947 and could be one of the Marine students going through the course of instruction at HU-2 *"borrowed"* the idea.

I might mention that by carefully controlling the direction of the slipstream from the main rotor of the helicopter, it was possible to accurately direct the raft (with occupant) to any portion of the lake desired at a fair rate of speed.

W. G. SCHAUFLER, ADC(AP)
FASRON-2
NAS QUONSET POINT

SIRS:

I noticed your publication in the school library and am interested in obtaining subscription information. Being ex-Army, I would like an Army publication similar to yours, but I don't believe they print one. Thank you for your cooperation.

MAXWELL MEYERS

23 GRAPE ST.
MALDEN 48, MASS.

¶ Glad to have you aboard, Army. Incidentally, *Naval Aviation News* now is sent free to 1800 junior college and college libraries all over the United States to help NavCad procurement program, and incidentally tell collegians what is going on in naval aviation. Anyone can subscribe to it for $2 a year. Just use the coupon on the back cover.

SIRS:

In your March issue you have two pictures of F2H-2 *Banshees* with wingtip tanks attached. You state that these are fixed tanks. My understanding is that these are droppable. Am I right?

NAVAL AVIATOR

NAVY DEPT.

¶ Someone gave us the bum dope on those tanks. They are droppable, but since a pair of 'em cost the same as a new Chevrolet, BuAer's budget boys hope you won't drop 'em.

SIRS:

I have recently read your excellent article in the February 1950 issue of NAVAL AVIATION NEWS concerning the naval air station at Lincoln, Nebraska. I want to thank you for the kind statement you made in my behalf and I have been basking in the glory of shooting down six Jap planes long enough.

I was awarded three Air Medals and a Presidential Unit Citation, but I feel I cannot take credit for six planes when my total was the only one I ever shot at in aerial combat—just *one!*

JAMES A. SEYBERT, LCDR.

AMES, IOWA

● NAS WHIDBEY ISLAND—Planes and crews from here aided in the search for the missing Air Force B-36 lost near Princess Royal island off British Columbia. Eight P2V's and a PBY-6A participated.

NAVAL AVIATION NEWS

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● THE COVER

SNJ's and JRB's from NAS Miami-Reserve weekend warriors head out to sea to drop flowers on Memorial Day in honor of Navy and Marine Corps men killed in the wars and buried at sea.

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● The printing of this publication has been approved by the Director of the Bureau of the Budget, 10 June 1949

SQUADRON INSIGNIA

WHEN VP-51's squadron insignia contest bogged down, their wives were let in on it and one, a former Disney cartoonist, came up with a winner. A guppy-bellied Early Bird stands astride the world, holding signal flags five and one and plucking a juicy "worm" out of the Pacific. This might be a snorkeling submarine found by its PB-1W planes. Another fanciful insigne is that of VP-28 featuring a pirate with bombs and guns over a sub and ship in bright colors. One of naval aviation's newest insigne is VC-33's mailed fist crushing a sub, while NARTU Lakehurst features blimps.

NARTU Lakehurst

VC-33

VP-28

VP-51

WHAT'S IN THE NEWS

NAVAL AVIATION NEWS

What happened to our old squadron? Was the carrier mothballed? And what became of old Jerry? If these are the questions you are asking, look to the *Naval Aviation News* to keep you informed of what happened and what's happening now. Wherever you are, the News will come to your door. Just send $2 to the Superintendent of Documents, Washington 25, D.C.

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