NAVAL AVIATION

NEWS

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Aviation Medicine

Air Force Bombers

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APRIL 1950

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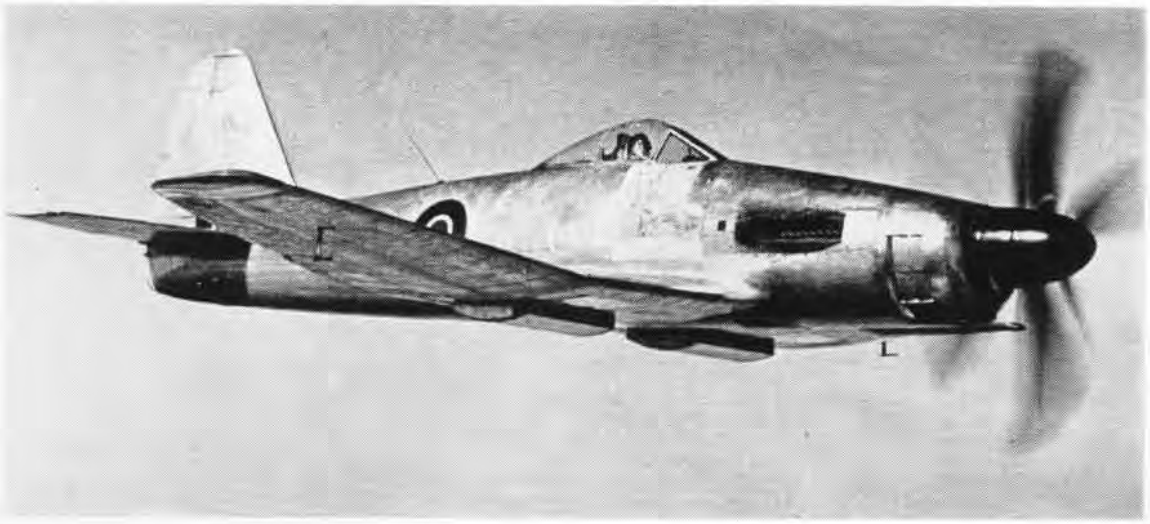
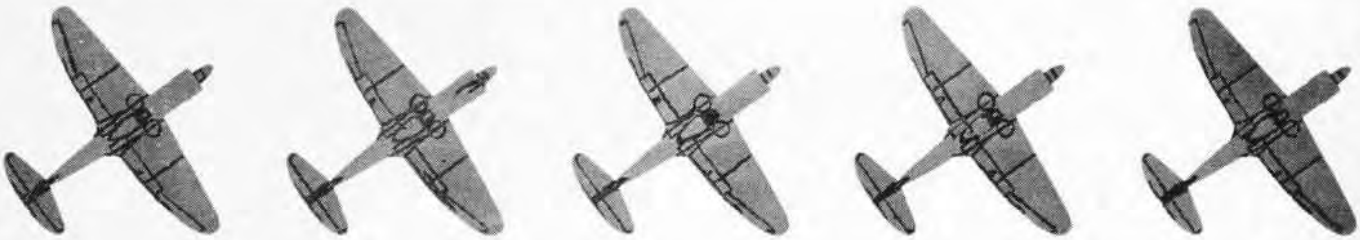
HIGH FLYERS

Two new fighters from the Royal Navy, but which ones are they? One looks like a bomber. Answers are on the last page.





AEROMEDICAL QUEST

EVERY time a plane goes higher, faster or farther, new hazards are created for the men who fly it. Each new step forward in aviation imposes a barrier of human problems which the science of aviation medicine has to surmount.

Not only must these problems associated with the expansion of flight into realms where man has never traveled before be solved as they appear, but the fact that they will occur must be predicted.

In aviation's infancy the barrier of anoxia resulting from high altitude flight was met by furnishing supplementary oxygen. Recently problems connected with decompression have been taken care of by cockpit pressurization. Now that the sonic barrier is falling to the onslaught of aeronautical science, a new challenge faces the men who devote their lives with zeal to the endless problems of aviation medicine.

Navy and Air Force research in this field covers a wide range. It breaks down naturally into several divisions, each with its specialists.

One phase is physiology. Studies are made of reactions of the body to unusual conditions. Psychological research plays an important part too.

Not as obvious but just as important is the field of basic research. Such work is done at the Naval Medical Research Institute, Bethesda, Md.

In the limited space available here, aviation medicine research can be given only a "once over lightly."

THIS IS THE WAY A PROPERLY DESIGNED LIFE JACKET SHOULD WORK

AN UNCONSCIOUS MAN WOULD NOT HAVE A CHANCE WITH THIS REJECT

TO THE average aviator, the role of the flight surgeon is limited to saying, "Say 'Ah'," and "Bend over."

As a scientist, however, his work isn't quite as obvious. With devotion common to all researchers, he delves into the unknown with unending curiosity and stamina.

Naval Aeronautical Medical research is scattered. Some of it can be found at the Naval School of Aviation Medicine at Pensacola. Basic work is done at the Naval Medical Research Institute at Bethesda, Md. Greatest activity is found in the Philadelphia area. The busiest place there is the Aeronautical Medical Equipment Laboratory which operates under the Naval Air Experimental Station at the Naval Base, Philadelphia. Also in the area is the almost complete human centrifuge at Johnsville. Some evaluation work is done at NATC PATUXENT RIVER, Md.

The Navy's research is part of an overall plan administered by the Secretary of Defense through the Committee on Medical Sciences of the Research and Development Board. Air Force aviation medicine work is done mainly by the Air Material Command, the Air University School of Aviation Medicine and the Arctic Aeronautical Laboratory. This article will deal with the Navy's part in aeromedical research.

Heading the program is RAdm. Bertram Groesbeck, assistant chief of the Bureau of Medicine and Surgery for Aviation and Operational Medicine. Liaison between BUAER, BUMED and DCNO (Air) is maintained by Capt. J. C. Early. Cdr. N. L. Barr is BUMED liaison officer.

It is only logical that basic work be done at Bethesda. Reactions to low temperatures, low pressures and high accelerations on the human body are studied in detail. These studies tie in with the general work of the Center whose activities encompass the entire range of military medicine.

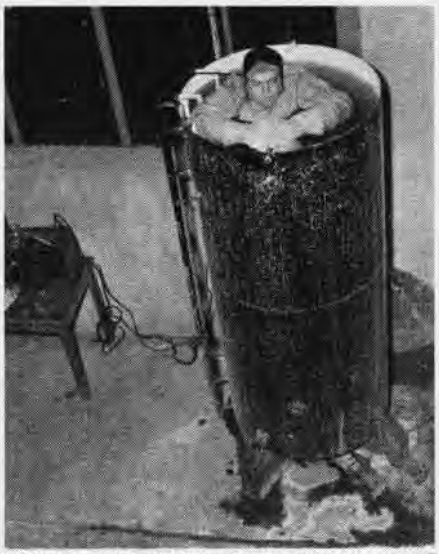
How much can a pilot drink and still fly efficiently? What effect does benzedrine have on him? Should he take antihistamines before flying?

Dr. S. W. Eyer at Bethesda with his team of researchers is continuing a quest for answers to these questions. By placing human "guinea pigs" in Link trainers and giving them measured amounts of drugs, attempts were made to gauge reactions. One answer obtained so far is that the trainer isn't the ideal way of measuring effects of drugs.

UNDER test conditions an individual who is given drugs tends to make a greater effort than normally. Inasmuch as accurate measurements are needed, it will be necessary to continue the testing by different methods. Benzedrine, alcohol and other drugs have their effects and aviators are warned against them, but for the answer on how much effect they have, there still remains much work to be done. In many projects blind alleys are found. Then another path has to be sought out.

The human body can withstand a certain amount of physical punishment. The answers to "how much?" are being found by testing human bones and replicas of the human body. The Bureau of Standards is working with

NOT HAIRLESS JOE, BUT COLD WEATHER GEAR



WHY SO GLUM, CHUM? TESTING EXPOSURE SUIT

SKIN TEMPERATURE UNDER SUIT IS RECORDED

Bethesda on testing the mechanical properties of bones and other structures. Thus the tolerance of the body to mechanical forces in crashes may be determined.

Along this line is the effect of the opening shock of a parachute. By using a dummy, a new chute with less shock is being developed.

A fancy term is " respiratory physiology." Simply, it is the efficiency with which the body absorbs and uses oxygen, and the way it handles other gases. With man flying higher and higher, his limits must be definitely known.

Some work on acclimatization of cells to high altitudes is in progress at Pensacola. The Navy, which has a small low speed, inertia type human centrifuge there, is conducting studies under the guidance of Lt. F. R. Stauffer.

IN FLIGHT testing of new aircraft, much data is sent to the ground via radio. This is called telemetering. Now a project is underway at Bethesda to telemeter physiological data from the pilot. It could be a life saver for a test pilot.

Anoxia is insidious. If the ground personnel noticed that the danger point was reached in oxygen lack, the pilot could be ordered to take remedial action. Likewise body temperature, skin temperature, blood pressure, pulse, respiration, electro cardiographs and electro encephalographs can be read on the ground. The Office of Naval Research is co-partner in this project.

An interesting sidelight on ability to absorb oxygen at high altitude was discovered at Bethesda. By transfusing red blood cells into a man, his degree of anoxia was diminished. This increased the oxygen capacity and content of the blood. An excess of red blood cells is called polycythemia. During polycythemia the pulse was slower. The condition lasts about six weeks.

For those of you who tend to gain in girth and weight here is what's been found, medically speaking. The medical ailments which grow out of obesity are one of the greatest medical problems between the ages of 30 to 60. A report states, "The small number of cases of obesity after the age of 60 is due to the fact that the obese do not live that long.

"Obesity as a menace to good health has been classified as enviable, laughable and pitiable. But in the light of recent studies it must be revised to unfortunate, more unfortunate and disastrous. No classification of obesity is possible on the basis of cause. It is all alimentary." Fat boys, take note.

Some investigations are in progress at a laboratory run in connection with the School of Aviation Medicine at Pensacola. Capt. Ashton Graybiel is head of the lab. Much of the work done there involves numbers of aviators and there are plenty of them available in the training command.

CDR. ALAN Grinsted, a psychologist, is trying to find out the speed at which persons arrive at decisions. By showing a pilot different kinds of pairs of pictures and recording the time to make a decision, he finds the variation from others tested. Individuals are influenced by different types of materials. When there is no emotional factor involved, it boils down to something similar to picking one piece of candy over another.

All students who leave the flight program, whatever the reason, are interviewed by Cdr. Grinsted. Results will be integrated into requirements for flight candidates.

Radium painted instruments have been analyzed by Dr. H. Schaeffer, who found that they emanate radon gas in unharmful quantities. Only circumstances where the condition might become dangerous would be in a pressurized cockpit where the air was not replaced, only oxygenated.

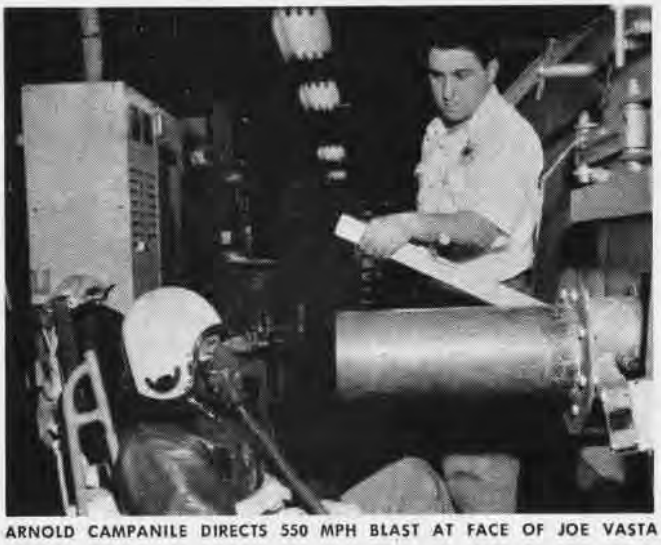
CAPT. A. GRAYBIEL, RESEARCH HEAD AT PENSACOLA, CDR. GRINSTED

LCDR. WELDON, CDR. VORIS, CDR. SCOTT, O-IN-C EXPERIMENTAL LAB

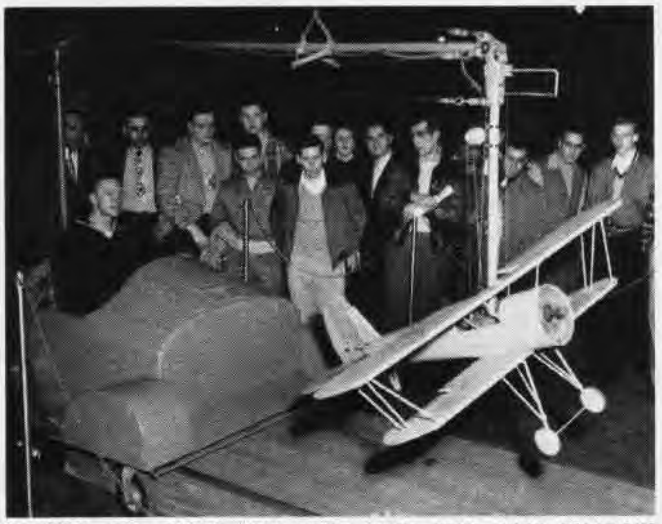
CAPT. POPPEN, RADMS SWANSON AND GROESBECK SEE SEAT TRAINER

OXYGEN BOTTLE EXAMINED FOR RESISTANCE TO GUNFIRE AFTER TEST

PENSACOLA SPECIAL TRAINER RECORDS SPIN REACTION OF LT. HILL



ARNOLD CAMPANILE DIRECTS 550 MPH BLAST AT FACE OF JOE VASTA



CLAUSSEN, ATI, SHOWS HOW LITTLE PLANE TESTS PILOT REACTIONS

DR. SCHAEFFER also determined, by theoretical studies, that, flying at 90,000 feet, a human would need the equivalent of a centimeter thickness of lead protection from harmful rays.

It has also been discovered that, above 72,000 feet, high speed atomic nuclei pierce live tissues about four inches, killing cells in their path four or five cells across. This is such an infinitesimal amount that they are replaced by some body tissues as fast as they are killed and no permanent damage results. Nerve and muscle tissue never regenerate however. Each nerve and muscle cell thus destroyed is lost forever. Destruction by nuclei is by mechanical collision, not electrical phenomena.

Speech intelligibility is a project which determines what words are more easily understood than others. This involves the use of acoustic rooms. This project is in part being pursued by Prof. John Black of Ohio State University. The school has a contract with ONR for the work.

Visual illusions play an important role in night sight. It has been discovered that looking at a lighted object set against uniform background causes the viewer to think the object is moving. This causes disorientation and vertigo. Also psychology comes into play when a person becomes fascinated with an object. This research is aimed at educating pilots as to what sensations they will encounter and to be prepared for them.

ABILITY to recognize stalls has been investigated at Pensacola. The SNJ gives more warnings than most planes on the approach of a stall, but it still isn't enough. This was proved through analyzing 6,000 stalls under the direction of 1st Lt. J. J. Hill, USMC. It is possible that future planes will incorporate stall warning devices.

All the research into the physiology and psychology of the airborne individual must be tied into practical applications somewhere. That is the job of the Aeronautical Medical Equipment Laboratory, skippered by Cdr. K. S. Scott. No pilot or aircrewman in the Navy can escape its influence. Every piece of gear which has anything to do with aircrew comfort and efficiency has the mark of AMEL on it. The laboratory's job is to prepare the high flying human to withstand a rugged environment. Thus in AMEL's building at the Philadelphia Navy Base, we see a variety of development from plebian socks to Buck Rogerish outfits.

Most of AMEL's work is started in its Human Engineering division. In general, it must consider the tolerance of personnel to low pressures and extremes in temperatures; try to overcome the harmful effects of high acceleration.

Vision comes in for close scrutiny. The psychological and physiological aspects of vision are considered in designing new lighting for the instrument panel, the cockpit and the exterior of the plane.

Oxygen equipment in great variety is designed. This is a never ending part of the work at AMEL and as long as humans fly high the project will have top priority.

AMEL'S DEVELOPMENT division improves design and tests oxygen breathing equipment, clothing, emergency rescue gear, acceleration and protective devices, cabin conditioning and high altitude suits.

Before we take a look at some of the more interesting projects, it must be explained that the lab could not function without highly-skilled scientists, a complete machine shop, expert tailors and specialists in many other lines. The low pressure chamber is one of the biggest in the Navy.

Bailout equipment for high altitudes is being designed. Pilot protection is the desired result. Insofar as possible all equipment will work automatically. A mask-helmet combination will reduce the effects of high speed air blasts. The ejection seat, now standard in most jet fighters, is still being improved. A new idea would have the drogue chute bring the seat and pilot to a lower safe altitude and then automatically release the bigger chute for the final descent. Also under development is an ejectable cockpit which will reduce the hazards of air blast. Still in the future is the pilot capsule. (NANews, March 1950.)

An ejection seat trainer at AMEL is used to indoctrinate fleet pilots. This tower fires a charge, lifting the seat about 40 feet up a tower. A portable trainer which can be folded up and transported on a truck is being constructed through the Special Devices Center on Long Island.

Another indoctrination job is in pressure breathing.

Crashes and what they do to humans are tested practically. That doesn't mean crashing planes. It's done by the HG-1 catapult. A car on a track is moved by a ram. By using dummies and plane parts a crash can be simulated. The car winds up in arresting gear after a run of 150 ft. Barriers, seats and cockpits are also tested. In each case there is complete instrumentation to secure information for use in future design.

In AMEL's dark room was developed red lighting for aircraft instrument panels. It is well known that ultraviolet light destroys visual purple, but that red light retains it. Now red lighting has been accepted as standard by both the Air Force and the Navy.

The "snooperscope" principle of the past war is being used in illuminating planes coming in for night carrier landings. For a bystander it would be a pitch black night, but the LSO, wearing a 'scope, would see the plane easily.

Improvement of exterior lighting of aircraft is under-

DR. THAUER TESTS CONCENTRATION OF CO_2 IN BLOOD OF O. R. KING

way too. Lucite is being tried and attitude indicator lights for carrier aircraft are being developed.

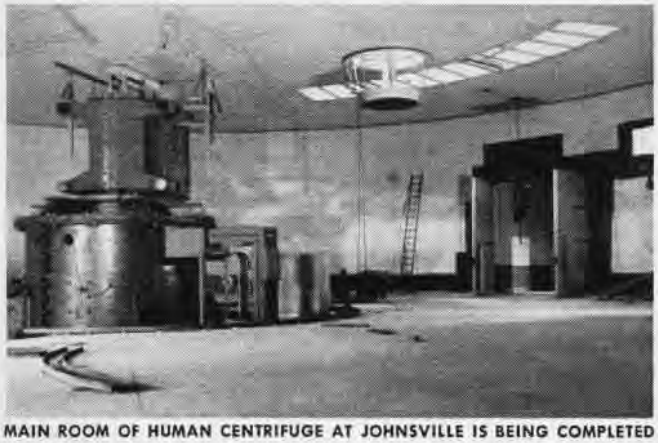
One of the bugaboos of jet engines has been the fear of personnel working around them that the high frequency noise is harmful. A sound room at AMEL tests hearing. Tests are continuing and protective devices and safety measures are being developed.

AN INTERESTING phenomenon came to light recently at Philadelphia when an F6U was being run on the ground. A deflector plate behind the exhaust sent sound upward. Weather conditions were such that day that reports were received from a circle four to five miles away.

A project is underway at the Naval Air Development Station, Johnsville, which is due to attract world wide attention. It is the Navy's new human centrifuge, constructed on a scale never before attempted. It is being built by Special Devices under the guidance of Capt. J. R. Poppen, (MC) and LCdr R. L. Christy. The centrifuge, driven by a 4,000 hp electric motor, weighing 160 tons and 110 ft. in diameter, is housed in a building containing some of the most modern laboratories in the world. A gondola which can be decompressed is mounted on gimbals at the end of the arm. It will be able to turn any direction. When this project is commissioned sometime early in the summer, NANEWS will carry a separate story on it.

In many places the Navy's flight surgeons continue their work. Their job is to keep you flying.

As Adm. Groesbeck says it, "We want to know what makes a good combat pilot, and when we have him we want to see that he is able to fulfill his mission with the best medical support possible."



MAIN ROOM OF HUMAN CENTRIFUGE AT JOHNSVILLE IS BEING COMPLETED

MUCH OF BASIC RESEARCH IS DONE AT BETHESDA NAVY MEDICAL CENTER

GRAMPAW PETTIBONE

He Had a Hard Time

Editor's Note: **After meeting monthly deadlines for seven years, the powers decided that *Grampaw* was entitled to 30 days leave all at once. Just before shoving off, the old boy warned the office force that he didn't want "any young squirts lousing up his page." He said he had been saving this pilot's statement for six years for just such an occasion. After reading this hair-raising account of an accident that didn't happen, we wonder if *Grampaw* has any more yarns like this in his files . . . if so we might let him go on leave again in 1957:**

"At 1100 on the morning of 10 Nov. 43, I took off from NAS GLENVIEW, Illinois, as pilot of a TBF-1, leading the second section of a division composed of one SNJ, three TBF's and one SBD-4. Our mission was to qualify in carrier landings aboard the USS *Wolverine*. (Note: This was one of two coal burning, side wheel, flat tops that operated in Lake Michigan during the war).

"We reached the carrier and shot six landings when we had to secure operations due to heavy snow fall. At 1415 we commenced landing operations again. On my second landing of the afternoon, I was told over the ship's speaker system that I was qualified and to circle the ship after taking off. A plane handler climbed on the wing and handed me a note stating that I had qualified and gave the bearing and distance to Point Option at 1430 at 297°, 25 miles. After taking off I made a wide circle around the carrier and fastened my chute straps, then joined up on the SBD, who was flying in the #3 position with the other two TBF's.

AT THIS time, about 1435, it started to snow again and the clouds were closing in all around the carrier. Visibility was about three miles and the ceiling less than 2000 feet. We circled the ship once, then the SBD, seeing me on his wing slid out and flew wing on me while I led the second section. We circled the ship a number of times always passing into the clouds ahead of the ship, then emerging comparatively free of them on the bow. Each time we circled the carrier a little tighter and as the weather continued to close in, the signal was given by the lead plane to lower wheels, and both planes in the first section lowered their wheels and turned on the downwind leg.

"In the meantime the carrier ordered us by radio to continue circling the ship and not to come aboard. The SBD was trailing way behind me so I decided to stay clear too and I left the formation as they turned upwind. I flew close aboard to starboard of the carrier at 500 feet altitude and noticed the SNJ which was to lead us home

parked on the bow as though to make room for us to come aboard. I turned at the bow of the carrier and again went into overcast, but came out on the port bow. The carrier was now sending blinker and the SNJ was being pushed toward the stern for take-off. Again she called and told us to keep circling. I tried to read the blinker but flew into the overcast at the stern of the ship.

I IMMEDIATELY turned 180° to port on instruments and then flew straight ahead for about half a minute then made a 30° bank, 180° turn to port and broke out into an open space, but could not see the carrier. I let down to 200 feet turned port 180° and proceeded to try to fly a square search to find the ship. I flew on instruments continually tightening the square search then I started expanding it but did not sight the carrier. At 1450 I heard the carrier call the SNJ and say that one plane bore 160° distance 7 miles. I was in a thin overcast then and could see the water from 200 feet, but no sign of the ship. I immediately turned to 340° and flew for four minutes on instruments and did not sight the carrier. I started a square search again, flying at 200 feet but after five minutes with no luck I flew two minutes toward the center of the area I had searched then headed 297° toward Point Option.

"I climbed to 500 feet since I was afraid of hitting some high building or water towers. After eight minutes I did not break out so I turned to 284°, which, had I been at Point Option, would have taken me to the air station, distance 7 miles. Again I did not break out so I decided the best thing to do, for the time, would be fly east and west and perhaps I would break out somewhere.

"I flew east 5 minutes, west 10 minutes, then I flew a square with six-minute legs starting on heading 030° and ending on 300°. Then I turned to 075° and flew diagonally across the square and then I turned to heading 090°. At 1600 180° was my course and I maintained it. My decision was that it would be best to try and fly out of the storm to the south since it seemed impossible to break out here in the north.

"I had been cruising at 150 knots with 1700 RPM and 25 inches of manifold pressure auto lean mixture and decided that was best to maintain since speed in getting out of the overcast was more important than maximum economy. My cylinder head temperature had been 100° for over an hour, but the engine was running smoothly so I had not worried. I now tried to bring it up by putting the prop in low pitch and opening throttle to 35 inches for three minutes, but it did not rise, so I returned to my former power and RPM setting and ceased to worry. Most of the time I flew 1000 feet, but occasionally would fly at 500 feet for ten minute periods, often descending to 200 feet in an attempt to break out. Twice I climbed to 10,000 feet trying to get above but with no luck.

"I switched to alternate air at about 1630 as the outside air temperature continued to drop. 1715 rolled around with still no luck and I decided I had better stay at 300 feet. I went down to 200 feet at 1730 and came out into a snow storm. I could see farmland, houses and barns through the snow. I began looking for a field solid enough to set her down in. I passed over a field which was brown and which looked like an ex-wheat field that had been pastured in clover. I turned to port to take another look and passed over a town of about 10,000 population. I went down to 150 feet and passed over the field again and saw two cows and several hogs on the north side, but the south side looked solid and free of obstructions.

"I DECIDED to see if I could find some smoke to tell where the wind was from so I flew back to town. I figured I had better put the carburetor air on direct ram to fly over town so I pushed the control lever in and started looking for chimneys and smoke stacks but could find none with smoke coming out. I circled the town twice then figured the falling snow should tell me the wind so I turned until it was falling thickest and I noted I was heading 270°. Then I turned to 180° and passed over town again and the snow seemed to come from my starboard hand so I headed east toward the field again and passed over at low altitude to the west. I was convinced the wind was from the west and, as I passed by the house, I noticed the farmer and his wife on the back porch pointing a flashlight toward the field I had chosen.

"I climbed to 200 feet at which altitude I could just distinguish the field and tried to change the throttle setting but she wouldn't move. I broke it part way loose and turned on the alternate air but the motor started sputtering as I came into the downwind leg. I put the wheels and flaps down, closed the throttle as much as I could and the engine quit. I immediately forgot all about the engine and made a 180° turn into the field from 200 feet and set her down tail wheel first, never touching the

brakes. She rolled to a stop about 20 yards from the fence headed directly into the wind, the prop just coasting to a stand-still.

"I shut all the switches and gas off, locked the elevator and ailerons with the safety belt, climbed out and shook hands with Mr. ————, the owner of the farm. He said I was two miles east of Greensburg, Indiana. We took the engine cover out of the radioman's compartment and covered the engine then made a lock on the rudder out of boards. I got my chute and we went into the house where I called NAS GLENVIEW, Illinois.

"The Indiana State Police guarded the plane that night while I got up five times to see if she was OK. Next morning a TBF, piloted by Lt. ————, landed at Howell Field, Rushville, Indiana, with two mechanics and 60 gallons of gasoline for my plane. The State Police brought them to Greensburg. They succeeded in starting the engine at 1645. 1700 I made a three point attitude take off out of the field, circled it three times and headed north following state road #3 to Rushville as I had been instructed to do. At the time of take off I had 160 gallons of gasoline and we figured that if I ran low we could refuel at La-Fayette, Indiana, on the way to Glenview.

"I FOLLOWED Road #3 and evidently passed over Rushville and proceeded on to Newcastle before I realized that I was too far north. I had inspected every town along my track for a field with a TBF in it but saw none. I now turned south and circled each town with all my lights turned on but could find no airfield. Back at the town which must have been Rushville, as I could see what looked like an unlighted airfield to the right of the road leading into the south part of town, I could see no airplanes. I circled the town for 15 minutes, called Lt. ———— on the *Wolverine* frequency and Navy Glenview frequency, but got no answer.

"Darkness had set in now and I decided that I could not find Mr. ———— here nor could he find me. I headed 340° hoping to make Stout Field, Indianapolis, and find Mr. ———— waiting there. At 1810 I had not sighted Indianapolis so I figured I must be too far east and probably somewhat north by now. I drew a rough map of Indiana on my flight overalls and plotted in Fort Wayne and LaFayette and my presumed position. Roughly I guessed the heading to Ft. Wayne as 010°, allowing for a 15 knot wind from 270°. I headed 010° and reduced RPM from 1600 to 1450 and manifold pressure to 23 inches and cruised at 130 knots, altitude 2500 feet. The moon had risen and the night was clear, cold and beautiful. I could easily distinguish the outlines of the snow-covered fields below. I circled several larger towns looking for airports and often flew off my course for 10 or 15 miles to inspect flashing beacons and larger towns but found no airfields. By 1845 the fuel pressure had dropped to zero on my left wing tank and my center main and I was on my last 20 gallons in the right wing.

"I tried to lean her out some more but with no success so I looked and prayed twice as hard. At 1855 I picked up the flashing course lights of Baer Field, Fort Wayne, about 30° on my starboard bow, distance 15 miles. I headed for them but could see no obstruction or runway lights, just those two flashing dits. In three minutes I could see one lighted runway, with the fuel needle bouncing below the 10 gallon mark I circled the field, blinked "I'm coming in," with my turtleback light, got a green light from the tower and made a Navy approach and set her down using the runway lights.

"At three minutes past 1900 she was parked in maze of DC-3's eight gallons of fuel aboard, but safe and unscratched and looking very proud and defiant.

"ONCE AGAIN I called Navy Glenview and next day, November 12, they sent an SNB piloted by ———— with Lt. ———— to Baer Field. I had her fueled and checked and the Army put an engine heater on her and once again she was ready to go.

"This time Lt. ———— climbed into the cockpit while I climbed into the passenger's seat in the SBD. By 1630 we were all back at Navy Glenview.

"Looking back on the past two days I can only wish, as I did then, that I had had proper maps, a Mark III plotting board and a computer, just these and a Dalton computer. Perhaps I did wrong, made the wrong decisions, and miscalculated the time from Greensburg to Rushville, but certainly I did the best I knew under the conditions and at all times I kept the safety of the ship foremost in mind.

"I regret the delay I have caused the Navy in regard to using the ship and the time it cost the officers and men who so ably came to my rescue. I am happy that I was able to bring her through three hours of instrument flight to a safe landing, got her off again and safely into another field with no help other than my compass. Certainly God was with me all the way.

"I wish to request that, whatever action is taken in regard to my conduct during the past few days, no change be made in my present orders from operational training to the fleet.

Respectfully,
ENS. ————, USNR

P.S. A check of the records shows that this student's wish was granted. He completed operational training and was assigned to a carrier squadron. However, just a year later, he lost his life in a mid-air collision north of New Guinea.

Protective Helmet Pays Off

The pilot of this F8F received an early wave-off in FCLP, applied throttle, but got no response from his engine. The *Bearcat* hit 500 feet short of the LSO with the left wing down. The wing tip broke off on impact, and the plane was righted and rolled 300 feet angling across the runway. When it hit a soft area the F8F flipped over and skidded about 35 feet on its back.

The pilot's shoulder harness and safety belt were tight and he was wearing a protective helmet—result—NO INJURIES!

Ride 'em Cowboy!

The pilot of this F6F had some trouble with his landing gear when he returned to the field after a flight of one and a half hours. He lowered his gear, but noticed that his right landing gear indicator did not register full down although he had 1450 lbs. of hydraulic pressure. The pilot raised and lowered his gear for a period of 15 minutes.

The CO-2 emergency system was used. Another aircraft flew alongside, but the pilot couldn't say for sure that the wheels were fully down and locked. The F6F pilot then flew past the tower twice and the gear appeared to be fully down and locked, so he was instructed to land. He was also cautioned not to attempt a turn off the runway until the gear had been visually checked after the landing roll-out.

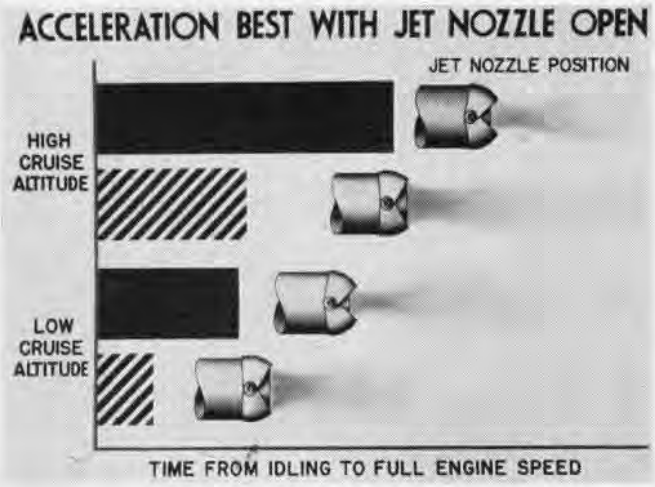
The pilot made his approach directly into the setting sun, and was partially blinded by the glare. He attempted to keep the plane's weight off the right gear and hesitated to apply right brake when the plane swerved to the left of the runway. He did not see that he was heading directly for the GCA truck until he was within about 60 yards of it. The starboard wing of the F6F hit the front of the GCA truck which was parked 150 feet from the edge of the landing runway. The aircraft then swerved

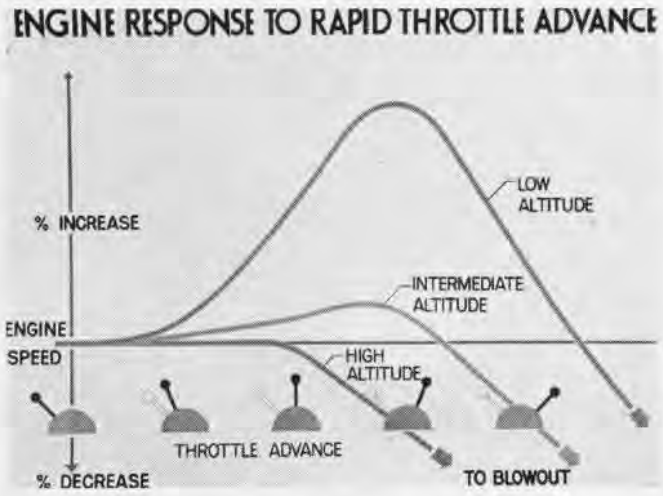
sharply to the right and nosed up. The fuselage broke aft of the cockpit.

Grampaw Pettibone says:

Say, that F6F looks like a bucking bronco! I think it's understandable that this fellow tried to keep the weight of the plane off the right gear, but it would have been worthwhile to wait a minute or two rather than land with the sun setting so close to his line of vision that he was unable to see where he was going.

HIGH ALTITUDE STARTING





If there is one place the Navy does not need "throttle jockeys"—the eager men who "shove the throttle up to the fire wall"—it is flying jet aircraft at high altitudes.

It is one thing to start a jet engine at sea level, give it a boost of gas and speed up the turbine blades. Then again, it is something else to fly at 50,000 feet and try to give the jet plane more power. Fighter pilots of the future have some new things to think about besides the enemy plane's maneuvers when they try to dog-fight at high altitudes.

For one thing, he cannot *ram* his throttle ahead. The extra squirt of gas will quench the fire in his jet engine and there he will be, a glider. Restarting his engine may take 100 times as much spark as it took when he fired off on the ground. It may not start at all.

The problems of high altitude starting and acceleration have been studied by the National Advisory Committee for Aeronautics at its Cleveland flight propulsion lab. They have some interesting things to report which all jet pilots should know. This article may not be as exciting to read as a Desperate Dan comic book, but it contains some pretty vital "word," as passed on by NACA's scientists, as to what they're doing to help Navy jet pilots to live longer.

The problem of starting turbojets at very high altitudes is much more difficult than starting on the ground, or at intermediate altitudes, because the very low pressures and temperatures at high altitude affect fuel ignition, combustion and engine acceleration.

In starting an engine at altitude, the pilot first opens the throttle and then turns on the ignition. The location and intensity of the spark in the combustion chamber must be right if the gas-and-air mixture around it is to burst into flames. Turbojet engines have sparkplugs in only two of their many combustion chambers. After those chambers have "fired off," the rest have to be ignited through "flame propagating tubes" connecting the chambers.

Once they all are burning, the pilot's problem is to accelerate without blowing out the flame or getting excessive turbine temperatures. As well as flying the airplane, he must carefully manipulate the throttle so as not to do either of those things. That's where the heavy hand is bad medicine. Acceleration at very high altitudes may require several minutes. How can you dogfight with that handicap? A good question.

Getting a combustion chamber to light off is a problem. One of NACA's demonstrations showed the gasoline igniting in a tube simulating a jet engine at 30,000 feet altitude. The flame catches quickly, but when the air pressure in the tube is reduced to that found at 45,000 feet the gasoline will not ignite. The energy of the spark plug must be increased three times to get the gas to flame and ignition commenced.

Some of the results found in the test are shown in the chart at the bottom of the next page, left. The curves show the air flow velocities past the spark plugs at 0, 25 and 54 feet a second. At 0 velocity, the energy required to ignite at 50,000 feet is 35 times as great as that required to ignite at sea level. As the air flow speeds up the energy required increases.

The next chart shows that the air-fuel mixture also affects the difficulty in getting a jet engine to ignite. It shows that energy required for ignition is much less if the mixture is neither fuel rich nor fuel lean. Increasing the flow velocity from 5 to 54 feet a second doubled the energy required.

These data show the importance of so locating a spark plug within the engine that the electrodes would be in a region where the flow velocity is low and the mixture composition at an optimum value.

Starting at Altitude

One of the problems of getting a jet engine to light up at altitude, once it has stopped, is to get the gasoline spray

LOW FUEL FLOW RATE GIVES POOR ATOMIZATION

FASTER FUEL RATE GIVES BETTER GAS SPRAY

fine enough for ignition to take place. At altitude, when cold thickens the fuel, it likes to come out in a dribble and that won't do. The problem is to develop a spray nozzle *(see photo)* which throws out a cone of spray near the sparkplug under all conditions of temperature and pressure.

At altitude starting conditions, however, the fuel flow required by an engine is 1/30 of that at maximum power at sea level and fuel pressure 1/900th. This low pressure will not give a good spray with present nozzles, and ignition is very difficult.

At 40° F, the spray from a nozzle comes out in dribbles and will not ignite with the spark plug in normal position, whereas a nozzle that would give a satisfactory spray under low pressures would enable ignition. Such nozzles are under development.

NACA research found, however, that by moving the fixed nozzle closer to the spark electrodes and using a more intense spark, ignition could be secured. By these changes, altitude starting limits were raised 50%.

Another problem of high altitude starting is the difficulty in getting the flame to spread from the two combustion chambers with the spark plugs. Cross-firing was obtained by using larger tubes between the chambers.

High Altitude Acceleration

The high altitude jet pilot has the problem of accelerating his engine without encountering combustion blowout or overheating the turbine. That is where the light touch pays off. Consider these questions:

The weight of rotating parts in a jet engine is the same at altitude as at sea level, and the power required to turn them over remains the same. However, the air flow through the engine and hence the power available to the turbine drop rapidly as altitude is increased. For example, at 50,000 feet, the turbine power is only 1/6 of that at sea level. With the high inertia of the rotating parts, this results in a lag in engine acceleration.

In addition, we have also the problem of avoiding excessive turbine temperatures and blow-out. Squirt too much gas into the combustion chambers and the temperature goes up. Open the throttle too rapidly and you blow out the flame and the engine is dead. *The pilot has to manipulate his throttle carefully to avoid these troubles.*

Take a look at the chart at the top of the previous page (right). Note the hump-backed curve showing engine response as the pilot advances the throttle rapidly at low altitude. Take a look at the increase he gets when he shoves it ahead at high altitude—none. It falls off and the flame goes out. How is a jet pilot going to dog-fight when he has those handcuffs on him?

This effect of altitude on permissible throttle advance is very critical for the pilot. At high altitude he must slowly manipulate it to accelerate and at the same time fly his plane in combat. One method of relieving the pilot of these duties is to use automatic controls; but this cannot increase the rate of acceleration of the engine even though they will avoid excessive turbine temperatures and combustion blow-out.

NACA is looking into another idea to increase turbojet engine power at high altitudes. Power drops rapidly as altitude is increased. But this power can be boosted by increasing the pressure drop across the turbine. This can be done by lowering the pressure downstream of the turbine by enlarging the exhaust-nozzle area. This requires use of a variable-area exhaust nozzle. (See photo top of preceding page, left.)

After acceleration has been obtained, the nozzle area can be reduced to that for best performance under normal operating conditions. The chart, lower right, shows how a variable-area nozzle can help. The solid bars show the time required to accelerate the engine to full speed with the variable-area nozzle in closed position. This corresponds to operation with a standard fixed area exhaust nozzle.

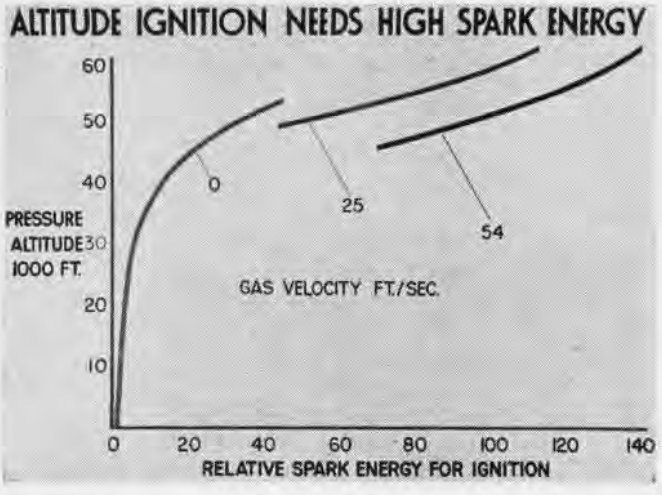
At the higher altitude there is an appreciable increase in the time required to accelerate the engine to full speed. When an acceleration is made with the variable-area exhaust nozzle in the open position, as shown by the cross-hatched bars, the time required to accelerate to full speed at both high and low altitudes was cut in half.

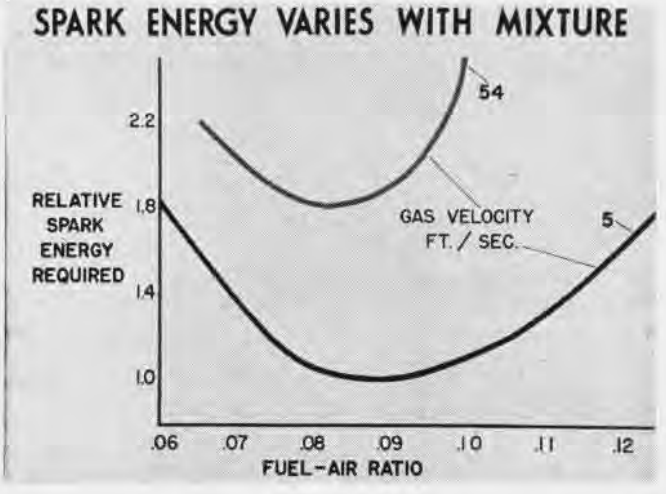
If this is considered to be the maximum time allowed to accelerate the engine at altitude, then it can be seen that with the variable-area exhaust nozzle it is possible to accelerate at a higher altitude in about the same time interval. This improvement amounts to a 30% increase in altitude.

Another method of improving altitude acceleration is to decrease the weight and therefore the inertia of the rotating parts. NACA is working on this problem also.

SUMMARY—We have seen that inserting the spark plug further into the combustor and using a larger spark gap and higher spark energy, doubling the cross-section of the cross-firing tubes, and installing a variable-area exhaust nozzle have raised the maximum altitude at which the pilot can ignite the fuel, expect all the burners to be quickly ignited and accelerate the engine.

This altitude at which starts can be made is nearly as high as that limiting operation of the engine at constant engine speed. These altitude operational limits of starting and constant-speed operation are adequate for current turbojet aircraft. Research is pushing these upward to meet the requirements of tomorrow's planes.





Budget Slashes Hit Air Shows

AERIAL PARADES LIKE THESE C-82'S AT IDLEWILD IN NEW YORK CRAMPED TODAY BY LOW BUDGETS

THE ECONOMY campaign in the Department of Defense has hit the air show business in the head.

With less money for gasoline and oil and fewer airplanes to do necessary training in, the Navy and Air Force have been forced to declare a "new deal" in lending military support to community air shows.

Since 1 January, a new policy has been in effect which will do much to restrict military aircraft to military purposes. People not close to the Air Force and Navy public information office will be startled at the flood of requests which have been received in the past from all corners of the United States for planes to feature some local celebration.

For example, in the three months June to August, 1949, the Special Events section of the Department received requests from 127 different places. Of this total, 85 events received varying degrees of participation and 42 were disapproved. In 75 percent of the cases, the state's Congressmen or Senators requested the Navy, Marines or Air Force or all three to participate.

The new policy, contained in *Navy Department Bulletin* 15 December 1949, which went into effect this year, puts down in black and white what the services can and will do to help out local celebrations. Air participation and public demonstration of military planes are limited to patriotic national holidays and events of national importance, like the Cleveland Air Races. Only three types of participation are authorized—the flyover, major shows where military planes will land and perhaps put on an aerial demonstration, and third, the open house where planes are displayed and demonstrated at government installations.

The whole business of furnishing aerial demonstrations has proved to be a headache for commanding officers of air stations, those in higher echelons and even members of Congress. Every crossroads town planning a tomato festival or dedicating a new bridge wrote its Congressman to get the Navy and Air Force to send over a couple of air groups plus the *Blue Angels* to entertain the populace. Before a coordinated policy was adopted by the services, it frequently did. Knowing the rivalry between the services, some sponsors played one against the other to get the biggest participation.

Requests came in for air demonstrations at dam dedications, veterans conventions, park dedications, business expositions, junior chamber charity shows, knife and fork club socials, centennial celebrations, flag day parades, cherry festivals, state conventions, funds raising drives, model aircraft meets, tree jubilees, peanut festivals, and parades commemorating early explorers.

These requests not only came from Cleveland Air Races and Miami Air Shows but also from such places as Yoakum, Texas; Napa, Calif.; Hay Spring, Nebr.; Brantford, Ontario; Vernal, Utah; Bellows, Oahu; Lubec, Maine; Gadsden, Alabama; Portales, New Mexico, Deer Park, Washington; Donaldson, Georgia, and Moncton, New Brunswick, Canada. Those are a few that put in bids for military planes last summer. Many were granted; most of them had congressional backing.

The services were snowed under by the requests. Congressmen were on the spot with their constituents to demand participation in events which they often knew were "small potatoes." The steadily-increasing demands cut heavily into training the Fleet and Reserve squadrons could do. Every week-end they had to fly over somebody's celebration instead of getting in their gunnery or instrument flying. Funds for gasoline began running out.

The Chief of Naval Air Training cited that in three and a half months last fall pilots had to make 113 flyovers which ate up $59,000 worth of their gasoline supposed to be used for training. Local sponsors pay for gasoline and oil used at demonstrations but that does not cover fuel used to fly 200 or 300 miles to the town and back to their station. They could call it "training," but the actual benefit to the pilots was exceedingly small.

The *Blue Angels*, Navy's crack exhibition fliers, for example, burn up 2,400 gallons of gasoline and 75 gallons of oil at each demonstration. The Marines' exhibition team, now dissolved, also appeared at many events, at a similar cost. Giant air demonstrations such as the Navy and Air Force put on at the Idlewild airport dedication in New York two years ago for nine days cost large sums that were not covered by the sponsors' payments. The Navy put 400 airplanes in the air in one day and installed costly catapult and arresting gear on the field to demonstrate techniques.

That dedication and others not only burned gasoline, they took the time of thousands of men, put time on airplanes and cost the services large amounts which they now no longer can afford to divert from training because of budget cuts. The Navy alone will take better than 20% cut in number of operating airplanes and flying hours in 1951 fiscal year starting this coming July. That means fewer aerial demonstrations and closer watching of the purse strings all along the line.

FOR MONTHS the fleet commands, training commands and individual air stations have been requesting the Department of Defense that they be relieved of some of the burden of flying for local celebrations so their limited funds will be available for uses for which appropriated. Under the new

over-all policy adopted 1 January, this will be more nearly possible, although the Air Force and Navy still participate in major events to some extent.

The Special Events section now requires all organizations requesting military aerial demonstrations to submit satisfactory proof that they have adequate insurance to protect the services in case of accidents involving spectators and property. They must have fire fighting equipment and ambulances available and must furnish financial details of the event. Sponsors pay for gas and oil of military planes, guards for the planes, hotel accommodations and transportation for service personnel before and during the event. In general, they must have a well organized plan of operations. They must be civic-sponsored, not for private gain.

When they had the time, funds and men to do the job, the two services were willing to go all-out to cooperate with local celebrations. In these days of slashing budgets, reducing flying time, laying off of thousands of pilots, folding up air stations, deactivating carriers and decommissioning scores of squadrons, the picture has changed. Their primary job is to defend the nation, and training for this job must necessarily come first. The Services are not abandoning their public relations activities, but are taking a closer look at events in which they can afford to participate.

Coordinating the requests for Navy and Marine participation in the Special Events section is LCDR J. C. Micheel, while Air Force matters are handled by 1st Lt. H. Thomas Tausig.

NAS Dallas Plans for Meet

To Play Host to Model Plane Makers

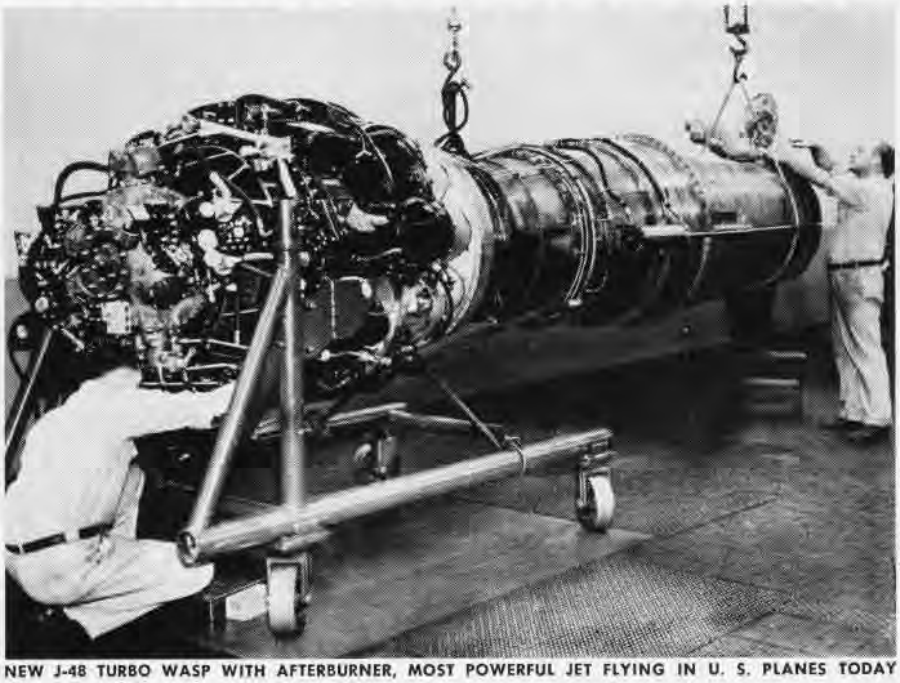
NAS DALLAS is buckling on its spurs, planning a real Texas welcome for the more than 1,000 contestants expected to attend the 19th National Model Airplane Meet from 25 to 30 July.

Although the Navy has served as host for the last two years, this is the first time that the meet will be held at NAS DALLAS. Following the pattern set last year at NAS OLATHE, the station will provide quarters and meals for the contestants at cost and will make available all its recreational facilities.

In addition, the Navy will sponsor two of the meet events. In one, Navy-sponsored contest model planes will be catapulted and landed aboard a simulated carrier flight deck. In the other, radio-controlled planes will drop bombs at tiny targets.

The meet, which last year attracted some 80,000 spectators, is sponsored by the National Exchange Clubs. Prizes to winners of the various events are offered.

New J-48 Jet Drives F9F-5 Panther



NEW J-48 TURBO WASP WITH AFTERBURNER, MOST POWERFUL JET FLYING IN U. S. PLANES TODAY

A NEW Navy jet engine, the J-48, capable of shooting a new version of the Grumman *Panther* through the air at well over 600 mph, has been announced by Bureau of Aeronautics and Pratt & Whitney Aircraft.

To be placed in the F9F-5, the new centrifugal flow will deliver 6,250 pounds thrust compared to 5,000 for the J-42 *Nene* already installed in the F9F-2. An Air Force fighter, the F-93A, a larger version of the F-86 *Sabre*, also has the J-48 engine.

The J-48 is equipped with water injection and an afterburner, both of which provide substantial power increases over the basic rating for short periods. At the high operating speeds of the two fighters with the new engine, the planes will have about 11,000 horsepower at their disposal, more than that used to drive a four-engined bomber of World War II vintage. At about 670 mph, one pound thrust equals about two horsepower from a conventional piston engine.

In addition to more than 20 successful flights in the F9F and F-93A, the J-48 has completed 1,800 hours of ground development testing. During those tests the engine actually delivered considerably more than its guaranteed ratings both with and without afterburner.

Initial production contract has been let by the Navy for 264 J-48 *Turbo Wasps* to power the Grumman F9F-5. Besides its ground tests and flight use, the engine was installed in the bomb bay of a B-29, complete with its long afterburner and operated in the air.

Development of the engine was done jointly by Pratt & Whitney and Rolls-Royce Ltd., of England. The British version is known as the *Tay* and does not have the afterburner. The two firms collaborated in building the J-42 *Nene* for use in American fighters, P&W using the basic Rolls-Royce design.

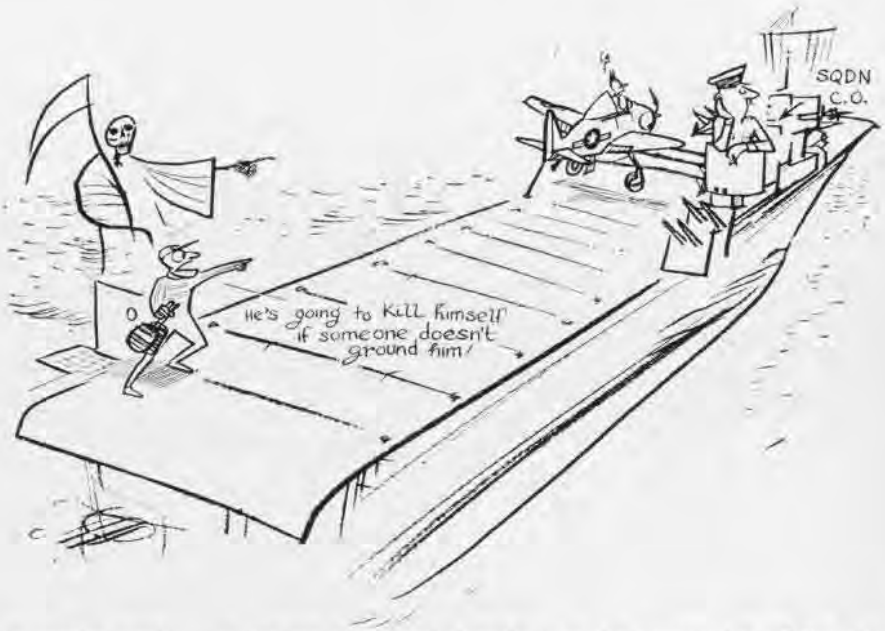
Although it develops considerably more power, the J-48 is almost identical in size with the J-42. Both are centrifugal flow. The J-48 is 50 inches in diameter and 8′ 10″ in length without afterburner. It has a single stage compressor with double-faced impeller and double air entries. It has a single-stage turbine and nine combustion chambers. Fuel is injected into these chambers at higher pressure than in any other American jet engine. It will burn kerosene, gasoline or JP-3 jet fuel.

An idea of the complexity of modern jet engines can be found in a statement by W. P. Gwinn, head of P&W, who reported it took 5,300 special tools, 9,000 operation sheets for shop guidance, 1,088 different kinds of parts—7,022 pieces in all—to make a J-42.

● NAS NEW YORK—The Supply group in WS-83 is off to a flying start on its new agenda for training, which includes lectures and seminars on supply and disbursing subjects with Professor Glover of NYU slated as the first speaker.

NAS CORPUS CHRISTI—The biggest single package ever received by the local port arrived recently from Pearl Harbor, a PBM operational flight trainer. The box was 35′x 19′x14½′ and weighed 35,000 pounds.

Sqdn. C.O. Is YOUR Back Turned?



SOME TIME ago a young Ensign engaged in carrier qualification landings flew into the barrier because of his failure to answer the LSO's signals. A couple of days before he had been involved in a similar accident. The LSO submitted a statement after the second accident which ended with these words: "If this pilot isn't grounded, he will kill himself."

In spite of this recommendation, the pilot was not grounded. Three days later, on his next attempt to qualify, his fighter plunged over the side of the carrier. The pilot's body was not recovered.

The fact that this young officer was dead and three planes were wrecked before even the first of the three accident reports reached the Flight Safety Section of the Navy Department, indicates the necessity for on the spot action to prevent tragedies of this sort. Evidently the landing signal officer was convinced after the second crash that this pilot lacked the high degree of coordination required of a carrier pilot, or that he needed additional FCLP. The Squadron Commanding Officer had signed each accident report and presumably had discussed the accident with the LSO, but he took no action to ground the pilot.

As for the pilot, he was undoubtedly strongly motivated to complete his landing qualification. No doubt he argued that he wasn't worried over the first two accidents, and was sure that he could meet the requirements if he were just given another chance. But that third chance cost him his life.

Responsibility for safety of flight must be assumed by those in command at all levels if there is to be an appreciable reduction in the number of aircraft accidents. The individual squadron skipper is charged with the responsibility for safe operation within his command. In fact, he himself may be recommended for replacement as commanding officer if the safety record of his squadron indicates a laxness of command responsibility as regards aviation safety. (ACL 25-47)

Careful investigation and accurate reporting of each accident will aid in the prevention of similar accidents in other squadrons. The attitude of the investigating officers is extremely important. An aircraft accident is a startling and shocking occurrence. There is intense interest for a brief time, but this interest soon fades. Little remains except the written report of the accident. Too often investigators experience a let-down when they have explained the accident to their own satisfaction. They fail to put sufficient effort and thought into the preparation of the aircraft accident report—the only lasting record of their investigation. This is a serious mistake because these reports form the basis for future action to prevent similar accidents. There is little point in uncovering facts if they are to remain buried in the minds of the investigating board.

The following questions have been prepared as a sort of personal check-off list for Commanding Officers who are anxious to improve the flight safety record of their squadrons:

1. Which pilots in my command can be counted on to take the correct action in the event of an in-flight emergency?
2. Do the pilots in my command plan their flights intelligently?
3. What action can I take to improve the level of flight discipline and overall proficiency among the pilots in my command?
4. How many pilots in my command can actually complete a cross country flight under IFR conditions without violating one or more Civil Air Regulations? What can I do to improve the general level of knowledge of the pilots in my command in regard to these regulations?
5. Do the pilots in my command realize the serious consequences of willful violations of flight discipline?
6. What additional supervision can I give to maintenance officers and maintenance men to prevent defective or improperly serviced planes from getting into the air?
7. What can I do to impress upon each pilot the necessity for reporting minor material defects immediately after each flight?
8. Does my operations officer realize that safety of flight is the paramount consideration in peacetime training? Is he sufficiently familiar with the limitations of the planes and individual pilots that he can exercise sound judgement in clearing flights?
9. Is my squadron flight safety really doing a good job. If not, is there someone else to whom I should assign these duties?
10. How many planes were damaged, how many pilots killed or injured, in my command in the past 12 months? Was there any action that I could have taken to reduce this toll?

Pilot Ejection Seats In News

C. E. STORM, ADC, RIDES EJECTION SEAT OUT OF JD-1 IN TESTS CONDUCTED AT EL CENTRO, CAL.

PILOT ejection seats, the current method of saving aviators' lives in high speed jets until such time as they are supplanted by ejection "capsules," continue to make news on several fronts.

Out at El Centro, Calif., live jumps were made the fore part of March in three types of manufacturers' seats. The Chance Vought, McDonnell and Douglas seats were tried out with jumpers from the Parachute Experimental Unit riding the seats out of a JD-1 (*see photo*). The Grumman-type seat already had been checked out with dummies and personnel.

As a result of a recent failure of an F6U seat to function, the Navy issued conversion kits for all Chance Vought seats in that airplane. Changes were made in the firing lanyard, the face curtain connection, the curtain itself; and the amount of force required to fire the cartridge in the ejection seat was considerably reduced.

When Lt. J. L. Holbrook, test pilot from Patuxent, attempted to take off from Mustin field at Philadelphia on 26 January, his F6U plane failed to clear obstructions at the end of the runway. A wheel struck, knocking it off. The *Pirate* had been at NAMC for ground blast deflector tests and during that time safety wires had been put on the face curtain handles and pre-ejection lever of the seat to prevent accidental firing.

When Holbrook took off, the safety wires were still in place. He continued to climb the plane to 13,000 feet and attempted to bail out off Atlantic City. He removed the safety wires and pulled the face curtain, but still it did not fire the seat out of the airplane. After three futile attempts, he turned the plane over on its back and bailed out.

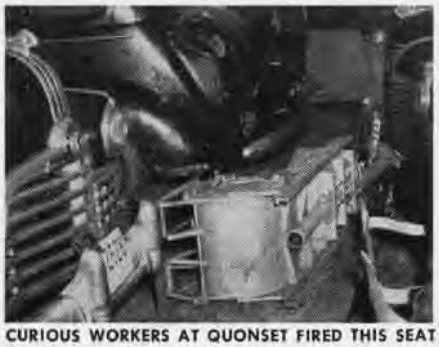
Extensive tests were made later by BuAer, Chance Vought and NAMC and it was found the lanyard and face curtain firing connections were marginal and did not always fire the seat cartridge. The change kit was issued, and all activities having F6U's were directed to modify the seats to prevent recurrence of the difficulty. The type curtain to be installed in the F7U was included in the kit to replace the F6U installation.

A third news event involving ejection seats occurred at NAS Quonset Point in January. Two O&R employes were looking at a wrecked F9F that had been ditched in the water. Out of curiosity, they attached a line to the firing mechanism of the ejection seat and pulled, to see if it worked. It did.

The seat soared out of the plane, flew high into the air and landed with a crash among parked cars some 30 feet away. Luckily the men had been at some distance from the cockpit; had they been leaning over looking in, their heads would have gone with the seat.

The motivating force behind a pilot ejection seat is an explosive cartridge. Plenty of safety provisions are built into these seats, but curious meddlers can always find a way to fire the charge, just as they can an "unloaded gun."

So far, nobody has been hurt by this charge, but personnel should treat it with the same loving care they bestow on loaded 20mm cannon or rockets with their pigtails plugged in. Adequate safety measures are provided if only individuals will observe them by following proper procedures.



CURIOUS WORKERS AT QUONSET FIRED THIS SEAT

Marine Makes It On Fifth

Wheel Almost Causes Accident

VMF-312, El Toro—1st Lt. Sidney Fisher accepted delivery on his civilian life insurance policy when he walked into his squadron headquarters on 17 January.

He went out and got into his F4U-4B and soared off into the wild blue yonder —and almost didn't get back.

Checking his landing gear later, he found he could not get the right wheel to lock down. He tried all the tricks without avail. Four times he descended on the field, bouncing his good left wheel in efforts to jolt the locking device into operation. No luck.

His fuel began running out. He got orders to set it down anyway. A throng of persons gathered to see the landing; emergency crash crews, fire engines, doctors and ambulances stood by.

Instead of the expected disaster of a ground-loop crash, onlookers saw a near miracle. The mechanism locking the wheel was jolted into proper place by the jar of contact.

Safety Board Made Colorful

Bait For VF-152 Pilots Is Cheesecake

VF-152, Pacific—Lt. (jg) R. M. Buller of this squadron has formed the "Society for the Prevention of Aircraft Accident Reports."

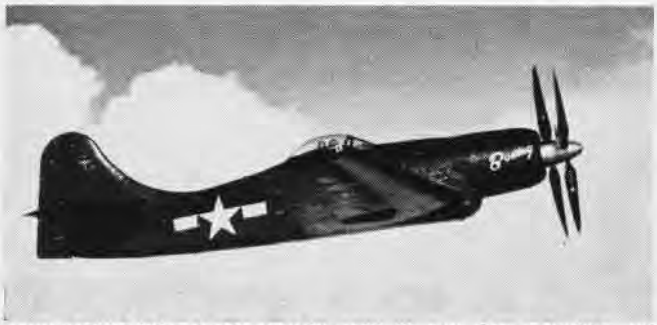
Buller is the squadron safety officer.

LT. (JG) BULLER SHOWS CDR. BOYD SAFETY ART

He doesn't claim to be original but his safety board is one of the brightest. Constructed of 1/4" plexiglas, the board is lettered and edged in red insignia paint and hangs in the ready room.

On it hangs the All Pilots board, SPAAR—the initials of the above mentioned society—and other attention getters in color. A bit of cheesecake is used as bait. Grease pencil can be used on the plexiglas and can be erased easily.

COUNTER - ROTATING PROPS



COUNTER-ROTATING PROPS PLAINLY SEEN IN THIS XF8B-1 BOEING JOB

DOUGLAS XTB2D-1 WAS ONE-MAN ATTACK PLANE WITH GULL-LIKE WINGS

USE OF two counter-rotating 15-foot Aeroproducts propellers on the *Convair* XP5Y-1 high-speed seaplane marks the sixth time since 1940 that the Navy has tried out the counter-rotating theory on combat aircraft.

In all other cases, the double props were used on reciprocating engines of fighters or dive-bombers, and for various reasons, none progressed to the operational stage. In the case of the big Consolidated-Vultee seaplane, however, the props are being hitched to turboprop engines, which, it is expected, will give less vibration trouble.

British fighters and torpedo planes have used counter-rotating propellers for some time with success. The idea has its advantages and disadvantages. The 1000-pound gearbox which must be attached in front of the reciprocating engine does not help the plane's balance or fuel-carrying capacity. In the past the gears have had difficulty in standing up under the vibrations set up during operation, probably the biggest reason the Navy has no counter-rotating prop planes today.

On the favorable side of the ledger, the counter-rotating propeller can deliver more power with shorter blades because it has six or eight "paddles." This holds down tip speed of the blades and gives more efficient propellers. It increases the water clearance of the blade tips in the case of seaplanes and lessens propeller damage from spray. In the case of single-engine planes, counter-rotating props do away with torque, a mighty handy thing in case of carrier wave-offs. Torque is the force that twists a fighter when power is applied suddenly and pulls the plane to the left so it falls off on one wing. Plenty of pilots are dead today because of torque.

In case the six-bladed counter-rotating propellers on the XP5Y-1 do not work out, the Navy has an eight-bladed one under development which may be tried out.

The first use of a counter-rotating propeller on a plane dates back to a German named Helmut Hirth back in 1912. The Navy did not try the principle out until 1940 when it let a contract with Engineering Products Co., of Dayton, Ohio, for two 13-foot, three-bladed propellers to be tried out on an R-2800 engine on an F4U-4. In 1943 another contract was signed with Aeroproducts Co., successor to the former company.

Hamilton Standard was signed up to develop two 14-foot, four-bladed counter-rotating props for the R-4360 engine on the XTB2D. Curtiss Wright contracted to put two three-bladed, 14-foot propellers on the XBTC-2 plane. Neither that nor the Douglas worked well.

Aeroproducts later in the war received a contract to put two three-bladed props, 13′ 6″ in diameter, on the XF8B-1, the only plane Boeing has made for the Navy since the famous F4B. Last Navy plane which tried to use the counter-rotating prop was the Curtiss XF14C-1. Two three-bladed, 14-foot props were hitched onto the R-2800 engine. As in the case of all the other four planes, it did not work out.

CURTISS XBTC-2 WAS DESIGNED TO FOLLOW SB2C

NOW THE Navy is trying out the counter-rotating principle on a turboprop engine instead of the piston engine. The T-40 General Motors turboprop engine is in reality two small turbojets which are hitched by long drive shafts to a common gear box close to the propellers. After some delay in perfection of the engine, the four have been installed in the XP5Y-1, and the seaplane is ready to fly.

The Air Force has tried out counter-rotating props and, like the Navy, has not had too good luck with them. One fighter, the P-75 *Eagle* built by Fisher Body Co., used them. Two bombers had them: the *Flying Wing* XB-35 had four engines, each with counter-rotating

SIX PADDLES POWERED CURTISS XF14C AIRCRAFT

SMALL NACELLES ON XP5Y-1 TURBOPROP ENGINE

EVER SEE THIS PLANE? DUAL-ROTATION F4U

fans, and the XB-42 Douglas *Mixmaster* with its propellers in its tail. A fourth was the XF-11 reconnaissance plane in which Howard Hughes was almost killed.

The British have the *Seafire* 47 on which the counter-rotating principle worked out efficiently, the Westland *Wyvern* I, the Avro *Shackleton*, the Fairey GR-17 ASW plane and on the giant *Brabazon* transport.

The Navy *does not often decorate the Air Force but in this case Cdr. H. D. Hilton of VP-4 pins an Air Medal on Capt. Russell G. Anderson, USAF. On duty now for a year with VP-4, Capt. Anderson won the medal on the Berlin Airlift, having 100 missions on it. He is asst. operations officer now for VP-4.*

WELL-PLASTERED BANNER TRIBUTE TO SHARPSHOOTING BY VF-51 EAGLE-EYES FLYING F9F PANTHER

Jet Pilots Riddle Banner

F9F Proves Good For Aerial Gunnery

VF-51—To disprove the theory that jets are just high speed racers, four pilots of VF-51 offer a view of a slightly-better-than-average target sleeve after a small encounter with four of their F9F-3's.

A total of 575 rounds of 20 mm. ammunition was fired on the 6'x30' banner, and an over-all grade of "outstanding" was attained by the four pilots. The over-all average was six percent above that required for an "outstanding" grade.

The flight was accomplished according to AirPac training and competition manual, except that the banner was not on the required 45° cant. The members of this squadron and VF-52 have made an enviable record in aerial gunnery through intensified training and practice calculated to take full advantage of the capabilities of the F9F.

Men in the accompanying photo were, left to right: A. L. Vaura, A02; V. R. McDonnell, A03; Lt. (jg) R. E. Oechslin, Lt. (jg) C. Pierozzi, LCdr. A. D. Pollock, CO; Maj. T. Conner, USAF; G. A. Russeau, AOAN; W. R. Petachow, A03 and E. Dominguy, A03.

Sportsmen See Navy Display

Naval Air Reserve Sponsors Exhibit

More than a quarter-million outdoor enthusiasts got a glimpse of their Navy at the ten-day, National Outdoors (Boat) Show on Chicago's Navy Pier. The show included an 8,600 square foot all-Navy display sponsored by the Naval Air Reserve Training Command.

Rear Admiral A. K. Doyle, Chief of Naval Air Reserve Training, with Chicago's Mayor Martin Kennelly and Col. Robert R. McCormick, publisher of the *Chicago Tribune*, cut the tape for the show's official opening.

The Navy's huge display was made possible through the cooperation of many commands. One of the biggest attractions was the builder's 22' scale model of the *Midway* in plexiglas, which enabled visitors to see the compartmentation and shipboard fixtures.

The Special Devices Center furnished an engineer's flight panel from a PBM, a student pilot trainer and several training aids. The Naval Aviation Material Center provided an aviation medical exhibit. NAS WILLOW GROVE sent a cutaway jet engine and NAS GLENVIEW a seven-man life raft. BUDOCKS furnished drydock models. Also included were models of practically every plane in naval service today.

Continuous movies, including the new *Weekend Warriors* film, were shown.

First Jap Target Is Closed

Kaneohe Air Station to Fold June 30

The air station where the first American casualties of World War II occurred at the Japs' hands is being closed.

On 30 June, NAS KANEOHE BAY, Hawaii, will be inactivated. The largest naval air installation in Hawaii during the war, it has been on a reduced maintenance status since June 1949. After it is closed, the station may be leased in whole or in part.

Jap planes flying in to hit Pearl Harbar on 7 December 1941 killed their first Americans at Kaneohe.

Winter Snow Hits Whidbey

Weather Worse Than at Kodiak

NAS WHIDBEY ISLAND—The worst winter in many years hit Puget Sound area in January and February, making flying from this island base difficult or near-impossible.

Just as a comparison, Kodiak, Alaska, had three days with snow and rain in January; Whidbey had 21. Kodiak's average temperature was 34.4 and this station's 24. Coldest day was 21 in Alaska and —1 at Whidbey. Average wind was 11.3 knots at Kodiak and 10 at Whidbey. To prove it was an unusual winter, the average temperature here was 14 degrees below normal for the previous six years of record.

Storm after storm swept over the station in January to blanket it with a sparkling snow mantle and bring also the severe cold of Canadian air. While the snow was appreciated by ski enthusiasts and nature lovers, the cold presented multifold problems to keep the planes flying.

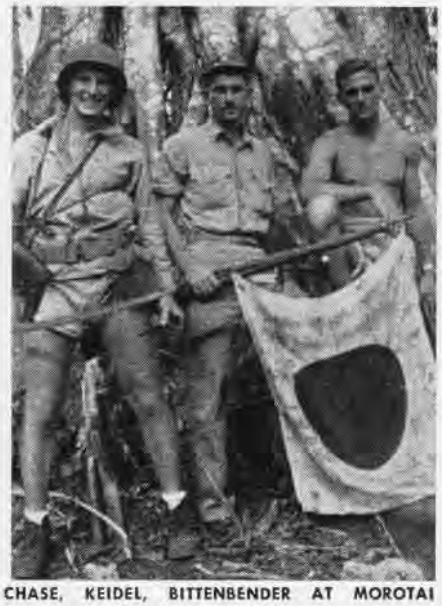
Public Works department used snowplows on the runways around the clock when necessary. Squadrons tackled the task of keeping aircraft free of snow and engines warm for starting. Not the least of the problems were heating, plumbing and proper readiness of fire and crash equipment.

Personal inconveniences mounted as the weather increased its wintry tempo, but over-leave among Navy men and absenteeism among civilians was low.

For winning *a footrace on the flight deck of the CV Valley Forge, Bob Wright, Los Angeles newsboy, wins a model Banshee. He receives the prize from Capt. H. B. Temple of the carrier. The ship was host to 135 carriers who saw naval aviation in action.*

PATROL BOMBING 104

WRIGHT'S CREW WENT THROUGH THICK AND THIN WITH THE SKIPPER WHO WON THE NAVY CROSS



CHASE, KEIDEL, BITTENBENDER AT MOROTAI

WHEN THE NAVY put Bombing Squadron ONE HUNDRED FOUR into commission 10 April 1943 at Kaneohe Bay, Hawaii, it fashioned a hard-hitting team from VP-71, a *Catalina* squadron which contributed half of its personnel to the new heavy bomber squadron. Cdr. Harry E. Sears, USN, headed the *Buccaneers*.

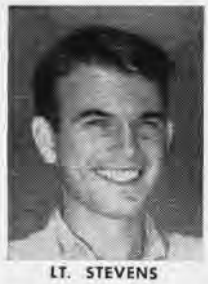
But commissioning did not mean that the veterans went into action at once. There were personnel to be assigned and trained, new PB4Y-1's to be ferried from San Diego, lectures to be heard and women to be married, although the last was, of course, a voluntary act beyond the call of duty.

These matters having been attended to, the squadron landed on the Marston matting at Carney Field. Although Guadalcanal was behind the lines by August 1943, it wasn't far from the front by air. Long patrols took the *Liberators* where enemy bombers were occasionally engaged in similar reconnaissance; and then there was a fight from which a PB4Y-1 had no need to run.

Lt. C. J. Alley and his crew had no trouble in identifying a four-engine *Mavis*, intercepted at 8,000 feet, 700 miles out. Seven seconds after the opening bursts, both starboard engines of the *Mavis* caught fire, flames trailing a plane length behind. The enemy nosed over and spiralled in smoke until it crashed into the water. An extra dividend of victory was one of the most dramatic series of combat photographs.

Lt. Anderson polished off a twin-engine bomber with equal facility. Andy sighted the *Betty* and chased it for 30 minutes, employing his altitude advantage to counteract the *Betty's* superior speed. In the first shot, he was almost upon her; in the second, he was literally flying formation at 50 yards. The *Betty* fell off, her port wing smoking and was shot to shreds.

CDR. SEARS



LT. STEVENS

The "flying skipper" set the pace! On an early mission, Cdr. Sears flew formation on a twin-engine *Nell* which his bow to top gunners expertly drilled, ducking fragments from the explosion which followed. Two weeks later, the skipper and his men made repeated masthead attacks on a freighter oiler which went up in flames.

BUT CREW ONE really hit pay dirt 4 November. Stretching the outgoing leg of an 800-mile night search, dawn found the *Liberator* over a convoy of two 10,000-ton tankers escorted by two DD's. Jinking, masthead runs through the ack-ack left both oilers dead in the water, one burning briskly and the other badly damaged. Less oil for the lamps of Rabaul!

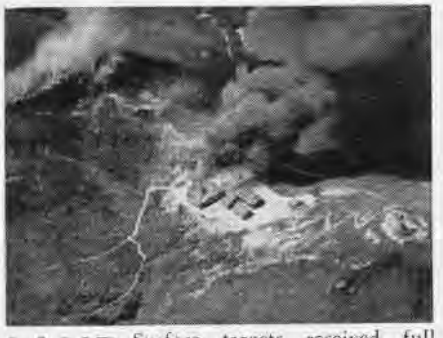
Two weeks later on a dismal December day, Cdr. Sears spotted six nondescript vessels trying to sneak from Truk to Kavieng. Treatment Able was proceeding smoothly until a shot-out engine sent the *Liberator* home with a confirmed four sunk, one probable and the sixth badly damaged, to be greeted with a welcome accolade: "For this one plane blitz, well done—HALSEY."

Lt. Whitney Wright was Operations Officer in the true sense of the word—he loved to operate on Japs. Some of his patrols were fabulous; for instance, the time he joined the landing circle at Nauru and shot down a fat *Betty* with its wheels down. Thirty minutes later he was still swatting *Zekes* while making for home. On another occasion near that same spot, a ship full of ammunition blew up as he was over its mast. Though 700 miles from home, he miraculously got back and landed his wounded crew at Carney without benefit of brakes or flaps and with no further damage to his plane. Missions like these won for Wright the Navy Cross, the first of 104 to be so honored!

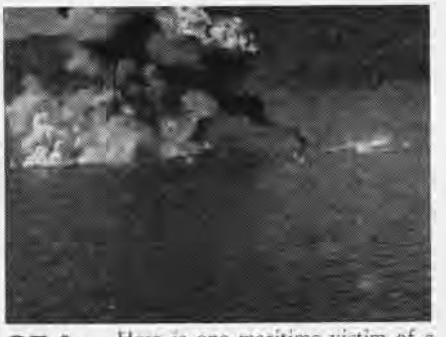
Lt. Bob Van Benschoten was one Liberator pilot who pulled off the astounding stunt of singlehandedly scaring an enemy task force into hiding. Long before Truk was more than a mystery wrapped up in armor, Van Ben chanced upon a Japanese force which included several heavy cruisers. At once he began sending word to our forces. Whatever attack the Japs planned was cancelled. Aware that they were spotted, they made a run for Truk.

ON 6 FEBRUARY 1944, VB-104 moved to Munda Field, New Georgia, to continue operations. By the end of its tour 29 March, the squadron had piled up an outstanding record of accomplishment in their 7½ months of ac-

★ THIS IS the twenty-five of a series of sketches of squadrons in World War II. It is based on reports filed with Aviation History and Research in DCNO (Air).



LAND Surface targets received full measure of 104's bomb power



SEA Here is one maritime victim of a successful sweep against shipping

AIR Many a Jap bomber met its doom as screaming 104's hit their target

tion. They had made 1,252 sorties while flying nearly 12,000 hours. They had destroyed or damaged 30 enemy aircraft, sunk or seriously damaged 51 ships and completed many an effective bombing raid on enemy installations in the South Pacific..

What really distinguished VB-104 is best stated in its Presidential Unit Citation, the first in the war to a patrol squadron: "Rendering pioneer service in changing the passive, defensive search into a daring and powerful offensive, BOMBING SQUADRON ONE HUNDRED FOUR has utilized to the full the potentialities of the PB4Y and its equipment, striking at enemy task force units and initiating the hazardous masthead bombing attack to insure direct hits on the target." To analyze this success is to recognize the elements which made it possible. The courage, devotion to duty and the self-sacrifice of those who did not come back will always be an inspiration to their teammates who did.

Re-formed and re-named 15 May 1944 at NAS, Kearney Mesa, California, VPB-104 after five and a half months of training returned to the Pacific Theater, arriving at Morotai in the Dutch East Indies 3 November for duty with FAW-17. The primary mission of the squadron was search and offensive reconnaissance with emphasis on shipping.

In the first month, there were 46 enemy air raids on Morotai, but despite the fatigue and interruptions caused by these regular atacks, VPB-104 rolled up an excellent score. Lt. Cdr. Whitney Wright, the new skipper, opened the action for Screaming 104 on 6 November when his *Liberator* got three direct hits on a 90-foot lugger and sank it. The crew encored this successful attack with another on a lugger loaded with oil drums. Set fire by 1500 rounds of .50 caliber ammunition, the lugger burned until it sank.

On 12 November, Lt. Paul F. Stevens sighted three enemy freighters convoyed by three destroyers. An attack under intense AA fire was made against the column of ships. The *Liberator* subjected the ships to heavy strafing and one FTB was sunk by three direct hits. Just before the release point on the FTB, the bow turret was knocked out by a hit, seriously injuring the gunner and wounding the bombardier.

Nearly two weeks later, Lt. George Waldeck and his crew were the victors in an air battle over Balikpapan, Borneo. They had gone into the harbor where they found one CL, two FTA's, and three *Sugar Charlies*. Just before the *Liberator* reached the harbor, it was attacked by two *Oscars* and three *Zekes*.

The fight was on as the *Oscars* dropped seven phosphorus bombs, two exploding dangerously near the Liberator. One *Zeke* orbited above while the other four planes came in for high side runs. One *Oscar* was hit at 300 yards, broke away and left the scene. One *Zeke* was smoked at 200 yards. The other *Zeke* and *Oscar* pulled away fast.

In December, VPB-104 started operating from Tacloban.

On the first, Lt. John H. Burton bombed a 1500-ton Fox Tare Charlie. One 500-lb. bomb landed at the bow, skipped to the stern and blew off the mast. One 100-pounder hit the stern and set the ship on fire. As Burton left the area, some 100 men abandoned ship. Four hours later, coming over the area, Burton saw the ship break up and sink.

Lt. Henry S. Noon will long remember 10 December 1944. On that day, he and his crew carried on a running fight for an hour. The Liberator was attacked by eight *Zekes* and two *Tonys* six miles out of Balikpapan Harbor. The enemy fighters made runs from nearly every position on the clock. Some head-on runs were made while the *Liberator* was at 65 feet altitude, the fighters passing underneath and forcing the PB4Y-1 to pull up to avoid collision. One *Zeke* burst into flames and hit the water; two others disappeared after being hit in the engines and wing roots. They probably never flew again.

During a successful attack on shore installations 12 December by Lt. Joseph D. Shea, ack-ack from the ship and shore batteries holed a gas line from the main wing cell and filled the plane with gas fumes. Five aircrewmen were overcome. Abbott was lost when he became unconscious and fell through the bomb bay door as he heroically transferred enough gas for the long trip home. All the others recovered.

In January 1945, special emphasis was placed on search and reconnaissance during the Luzon operations, and no bombs were carried during this month. In consequence, the shipping tonnage sunk or damaged decreased. But the next month, bomb loads were resumed, and the squadron sank 51 vessels for a total of 14,880 tons. Eight enemy airplanes dived earthward for the last time, flaming targets of 104.

On 6 February, Lt. (jg) Earl Bittenbender exploded a 200-ton Sugar Dog off Ishigaki Shima after missing with three 100-pounders. On his second run, the ship blew up just as Bittenbender was at the release point at an altitude of 75 feet. Debris thrown up into the plane damaged wings, ailerons and rudders. The #4 engine cowling was bashed in, and the #2 engine was put out of commission. Heading for the nearest landing field, Lingayen, 550 miles away, Bittenbender managed to get the plane back. But it was the *Liberator's* last flight.

On 2 March 1945, the squadron was transferred to Clark Field from where the China Coast was covered to within 30 miles of Shanghai. The northern search included the entire coastline of Amami O Shima as well as Okinawa and Daito Jima. To the end of May, VPB-104 made its steady drive against the enemy.

On its second combat round, from 6 November 1944 through 31 May 1945, VPB-104 had flown approximately 12,500 hours, destroyed 49 aircraft, of which 38 were airborne, and scored 12 probables. It had sunk 254 vessels and damaged 262. Its raids on installations had been costly to the Japanese.

The effectiveness of the Screaming 104's did not go unnoted. A Presidential Unit Citation for its second round, made 104 the only squadron to be thus honored twice and heralded its tremendous contribution to our victory.

'FLYING STOVEPIPE' SOME CALL IT, BUT FEW MISTAKE THE SIX PUSHER PROPELLERS AND BARREL-LIKE FUSELAGE OF THE TOUTED B-36 BOMBER

AIR FORCE BOMBERS

THE U. S. Signal Corps bought its first Wright brothers biplane back in 1908, a 25-hp biplane with a top speed of 40 mph. It weighed 1360 pounds.

Forty-one years later, military aircraft as exemplified by the Air Force's B-36 weigh up to 326,000 pounds. Its six engines turn out 21,000 horsepower. Fighters like the F-86 have passed the 700 mph mark and research planes like the X-1 flown far past the speed of sound.

Nowhere in the Air Force's stable of planes is there more heterogeneity than in bombers. No two planes closely resemble the other in shape or size. Ease of recognition has improved, but with the vast increase in speeds of jet bombers the time to recognize has dropped. The jets fly higher, too, and will be no recognition problem to ground watchers who won't be able to see them anyway.

Nobody is going to mix up the B-36 with its six pusher propellers and stovepipe fuselage with the Boeing B-47 with six jets in underslung pods and narrow wings swept back 35°. The Air Force mixes propellered planes and jets in the bomber field, whereas today's fighter stable is all jet with the exception of the P-82 *Twin Mustang*. Of the eight AF bombers currently in the ring today, the B-26, B-36, B-29 and B-50 are propellered jobs, and the rest are jets. The B-49 *Flying Wing* has been fitted with both props and jets.

This article will deal briefly with those eight types of bombers, from a recognition standpoint, giving a few facts on size and performance. They fall in three classes, the light, medium and heavy bombers. World War II's heavy bomber, the B-29 *Superfortress*, is today's medium, along with its big sister, the B-50 One X model, the XB-51 by Martin, is included although it has not yet become operational like the rest.

B-26 *Invader*

The only World War II bomber active today in the Air Force besides the ubiquitous B-29 is the B-26 *Invader*. During the war it was known as the A-26. A number were procured by the Navy, called the JD-1 and used for target towing and other utility purposes.

Classed as a light bomber along with the speedy B-47, this propellered plane is considerably smaller, weighing only 26,000 pounds. Two long, slim nacelles extend far forward of the thin wing's leading edge and aft of the trailing edge.

Two P&W R-2800 engines give the plane 2,185 hp each on takeoff. An excellent close-support plane, the B-26 can cover 2,000 miles and carry a maximum load of 5,000 pounds. The Air Force has received 2,500 of the planes.

Besides using it for a standard light bomber, the B-26 also serves as a reconnaissance plane and for towing targets. The attack version has a solid nose and packs various combinations of guns from .50 to 75 mm cannon. If strafing is wanted, the plane has been loaded with as many as 18 .50 cal machine guns, all under central fire control.

The B-26 is pretty familiar to most recognition spotters. Its high, square tail, thin fuselage, underslung nacelles and long narrow wing make it an easy one to spot. The Air Force has a lot of B-25's flying around today, but they are used mostly for utility hops and flight time.

B-36

Probably the most-discussed plane in the world and certainly the biggest military plane flying operationally today is the six-engined Consolidated Vultee B-36. Recognitionally-speaking, the plane can be seen a long way off because of its extreme size and recognized just as far. The only military plane with pusher propellers, it is powered by six

P&W R-4360 engines with water injection.

Each engine develops 3,500 hp and drives 19-foot Curtiss propellers. The long, cigar-like fuselage, high tail resembling the Boeing design, swept-back wing located in the middle of the fuselage and pusher props make it easy to spot.

A number of B-36's are being delivered as long-range, high-altitude reconnaissance airplanes, designated RB-36's. The Air Force plans to put jet pods on the underside of each wing, with two General Electric J-47 5,200-pound thrust jet engines in each pod for added speed over the target. This version is known as the B-36D. All B-36's will be so modified.

The B-36 has a wingspan of 230 feet, a length of 162 feet and a height of nearly 47 feet. Maximum gross weight is 358,000 pounds. The AF claims it will fly 10,000 miles with 10,000 pounds. They put a big fat fuselage on it to carry cargo and designated it the XC-99. The B-36 has flown 10,000 miles nonstop with a 10,000-pound bombload, which was dropped at the end of 5,000 miles and at a reduced range it has carried a maximum bomb load of 84,000 pounds.

A 15-man crew flies the "flying drainpipe." Eight remote-controlled tail, belly and top turrets with 20 mm cannons comprise the armament. All but the nose and tail turrets retract in flight.

BOEING B-50D SUPERFORTRESS PACKS TWO 700 GALLON EXTERNAL FUEL TANKS FOR MORE RANGE

B-45 *Tornado*

Most jet aircraft have little resemblance in shape to conventional planes, what with their sweptback wings, thin wings, no props and most power plants buried out of sight in the fuselage or wing roots.

An exception to this is the North American B-45 four-jet light bomber. It looks like a conventional B-26 in many ways. Its two long nacelles extend fore and aft of the wing and each houses two J-47 jet engines, giving it 20,800 pounds of thrust for take-off.

Like many jets, the elevators are mounted fairly high on the rudder, with dihedral to get them out of the jet exhaust blast. The landing gear is the conventional tricycle type instead of the tandem or other arrangements found in jets like the XB-51 and B-47. Recognitionally speaking, the B-45 has the typical squared-off North American horizontal stabilizer and rudder like the F-51. Its evenly-tapered wing is well back and high. The long projection of the jet nacelles ahead of the wing is probably the best way to spot the plane.

The two JATO units of the B-45 have been mounted on the underside of the nacelles to give it an extra 8,000 pounds of thrust for take-off. Its wingspan is 89 feet, compared to 116 for the Boeing B-47 whose wings are actually much longer because they are swept back 35°. The *Tornado* weighs 110,000 pounds,. Pressurized cabin and refrigeration are standard features of the plane, as they are with all jets designed for high altitude and fast flying. The first jet bomber to enter squadron service, it carries four crewmen to the B-47's three and can pack 10-ton bomb loads.

B-47 *Stratojet*

One of the deadliest planes in the air today is this Boeing medium bomber with its slim, swept-back wings and thin fuselage. For all the world like a flying arrow, the B-47 will be easy on recognition experts—pilots will know what it is but they probably won't be able to catch it. The Air Force puts the bomber in the 500-mph class, but on a routine hop across the country from Moses Lake, Wash., the B-47 with some tail-wind help *averaged* 607 mph. for the 2,289 miles to Washington, D. C. in 3 hours and 46 minutes.

Because of its extreme speed for a bomber, the B-47 has practically no defensive armament, only a tail turret with 20 mm cannon for rash fighters who try to intercept it. Any other kind of attack would be impossible on a jet.

The B-47's 116-foot wing span is slightly deceptive since the wings are swept backward at a 35° angle. The span would be much greater if the wings were at right angles to the fuselage. No other airplane flying has its power plants located in the position the B-47 carries its six jets—on nacelles located several feet below the wing. Six J-47 jets give the plane 31,200 pounds of thrust. To get the bomber in the air faster, 18 JATO units are installed inside the fuselage on both sides forward of the elevators.

To slow the plane down for landings,

SIX-JET BOEING B-47 WITH SWEPT WINGS CAN OUTRACE FIGHTERS; CROSSED U.S. AT 600 MPH

WAR-TRIED B-26 (FORMERLY A-26) BOMBER STILL FLIES FOR THE AF

MARTIN XB-51 GROUND SUPPORT PLANE HAS THREE JETS, HIGH ELEVATOR

if required, the pilot can pop a ribbon parachute located in the fuselage below the tail. Three men comprise the crew, the pilot and co-pilot sitting in tandem fashion in the small cockpit and the bombardier-navigator-radar operator inside the fuselage.

The plane is 108 feet long and stands 28 feet high at the tip of its swept-back rudder. Maximum pay load is more than 20,000 pounds of bombs and gross weight loaded 195,000 pounds. Ceiling, thanks to pressurized cabin, is 35,000 feet and combat range 800 miles. Refrigeration is provided when the speed gets up so high the airstream heats up the fuselage.

An unusual feature of the B-47 is its tandem landing gear with stabilizing wheels on outriggers near the wingtips.

B-49 *Flying Wing*

Classed with the two Boeing *Superfortresses*, the B-29 and B-50, as a medium bomber, this strange flying machine will never be mistaken for anything flying on this side of the ocean at least. The British have had flying wings but small versions; this one is an eight-jet 213,000 pound version that looks like a B-36 wing they forgot to attach a fuselage to.

Without a rudder and elevator to help in controlling it, the B-49 relies on elevons and jaw-like flaps for a rudder effect. Four vertical air separators help give it longitudinal stability and hold down yaw. The photograph shows the flaps open at either end of the long wing.

Because of its strange design, little need be said about its recognitional features. One look at a photograph of it tells all. Besides the eight jet exhaust pipes and four elevons, the trailing end of the plane has a bullet-shaped projection almost like a giant .50 cal bullet facing aft. Atop this is a bubble canopy where the flight engineer operates. A 13-man crew is required to fly the big wing.

Air scoops for the eight jet engines are in the leading edge of the wing, much as they are on the B-36 propellered bomber. In fact, Northop has tried using conventional engines and props on another version, the XB-35. Various combinations of jets and turbo-prop engines were tried out on the XB-35. The Air Force at one time contemplated buying 30 RB-49A-CO's from Convair but that order was shelved. The second YB-49 crashed at Muroc during testing. Currently there is only one B-49 in existence, and the Air Force has no plans for additional purchases at this time.

A few statistics will help give a clearer picture of this oddity. Its wing span is 172 feet, 60 feet less than the B-36. Overall length is only 53 feet, owing to the lack of a tail. It weighs, loaded, 213,000 pounds, is listed in the 500-mph class and has a combat radius of 1,500 miles, greatest of any jet bomber by almost twice. It can pack more than 15 tons of bombs. The B-49 once flew 3,600 miles in 9½ hours, longest jet flight on record.

NORTHROP B-49 FLYING WING IS WEIRDEST PLANE IN AIR TODAY: SIX JETS POWER THIS ONE

B-50 *Superfortress*

Recognition of the B-50 medium bomber of the USAF is especially important today since the Air Force also is flying B-29's and the Russian Air Force is known to have a number B-29's built by the Soviet aircraft industry.

Sometimes called the "non-identical twins", the B-50 is the big sister to the war-proven B-29. Its main difference, from a recognition standpoint, is its much larger rudder and horizontal stabilizer and its different nacelles. The B-50 tail sweeps sharply up to make it look as if it were in a "standing up" position; the B-29 slopes gently up to reach and suggests a "sitting" position. Thus, from the side, there should be little trouble differentiating between the two. From other directions, not so good.

The B-29 is powered by four Wright *Cyclones* with 2200 hp apiece. To give the later version more speed and range, the B-50 came out with four *Wasp Majors* with 3500 hp. To accommodate the larger engines, bigger nacelles of different design were put on the newer plane. Chief visual difference from the front or below is the big chin scoop halfway back on the nacelle. The B-29 had its scoop directly on the cowling leading edge.

From underneath, the B-50's nacelles are all about the same length and extend to or past the trailing edge of the wing. The B-29's two inboard nacelles reach the trailing edge but the outboard nacelles end at the front of the flap.

In the photo on page 19, the B-50D looks like a six-engine bomber with its two 700-gallon external fuel tanks under the wings. The same fittings can

carry 4,000-pound bombs if required.

The big bomber has a speed of more than 400 mph, compared to 350 for the B-29. Its total bomb capacity is 28,000 pounds, as compared to the 20,000-pound load the B-29 can carry. The B-50D has a combat radius of more than 2,300 miles. Gross weight is 170,000 pounds, compared to 278,000 pounds for the giant Convair bomber.

New radar and radio equipment, an all-plexiglas nose section, a new top forward gun turret and a single-point refueling system are other features of the B-50D. The planes can be refueled in flight, as can some of the B-29's (see photo, below).

JATO UNITS ON NACELLES HELP NORTH AMERICAN B-45 FOUR JET BOMBER GET INTO HIGH SPEED

FOUR JET ENGINES IN PODS SOUP UP B-36

The B-29 and B-50, rated as medium bombers, form the backbone of the strategic air force. Outside of the bigger tail and bigger engines and nacelles, there is little apparent difference between the two planes. The B-50 has three inches more wing span and both are the same length. Five feet more height in the tail is the 50's main side view difference.

XB-51

Newest of the Air Force's light bombers is the Martin XB-51, a three-jet high-speed ground-support aircraft which will give few persons trouble in recognition.

The fuselage of the new plane looks like a giant cigar. Midway along it are two wings with the conventional 35 degrees of sweep back. A smallish rudder and vertical stabilizer perch atop the aft end and on the exact top of this come the elevators. It is the only plane in the U.S. today with that arrangement and lifts the control surfaces high above any jet exhaust.

One of the big recognition features, also, is the arrangement of two of the J-47 jet engines. In separate nacelles, they are slung under the belly of the plane like a fighter carrying a pair of *Tiny Tims*. The third jet is within the fuselage. Its air intake is a trap door located in the fairing ahead of the vertical stabilizer.

The Air Force's first three-jet airplane, the XP-51 has a span of only 55 feet and a fuselage 80 feet long. Lateral control is aided by spoiler-type ailerons on the upper surfaces of the wings to those on the Navy P4M. Landing gear is of the tandem or bicycle type originally developed by Martin for the XB-48. Only two men are required to fly the new plane, a pilot and bombardier-radar operator-navigator. The XB-48 was a six-jet 100,000-lb. plane.

The XB-51 has made its first flights but it will still have considerable testing to go through before it drops the "X".

Like the B-47, the 51's swept wings droop downward when not in flight, carrying a slight cathedral angle (negative dihedral, for beginners). Like the B-47, it also has a ribbon-type parachute in the tail for deceleration during landings on short fields.

The Air Force has had a number of bombers which flew but never got out of the experimental class. One was a pencil-like four-jet XB-46 built by Convair. It has its quartet of J-35 GE's in two nacelles much as the B-45 but it was a considerably larger plane.

Another "almost" bomber was the XB-48 by Martin with six jets engines in square-nosed nacelles. It had tandem-type landing gear first used in Martin's XB-26H in 1945. The Martin plane had a 108-foot wingspan and weighed 51 tons, slightly larger than the Convair jet.

A third bomber which was tried out was the XB-35, the *Flying Wing* with four pusher propellers or six to eight turbojet engines. This plane was the forerunner of the B-49 and was purely an experimental attempt.

There are some more "numbers" of Air Force bombers about which not much is known, such as the XB-52, a turboprop aircraft by Boeing; the XB-53 by Convair, the B-54 and XB-55 by Boeing. The B-54 is a revised B-50 with 4360-VDT engines. They may always be only letters.

OLD FAITHFUL B-29 NOW CAN BE REFUELED IN MIDAIR; RUDDEVATORS ON BOOM ENABLE TANKER PLANE TO 'FLY' INTO CONTACT WITH LOWER

A Salty Tale From Alaska

Ice Bothers Migrating VP-1 Men

VP-1, ALASKA—This squadron lays claim to the title of "The Saltiest Land Planes in the Navy."

During its recent deployment to Kodiak, eight P2V-3's were flying underneath at 500 feet into the teeth of a full gale, when a coating of the most tenacious form of rime ice ever encountered began to form on the aircraft.

The less experienced pilots immediately turned on the wing heaters, but to no avail. Alcohol couldn't remove it from the windshield. This teetotaler ice just wouldn't melt.

Its presence became a matter of concern when the aircraft were ordered to the alternate at Anchorage. Night landings were made by all planes with a bare minimum of forward visibility and an extra five knots thrown in for the ice.

After the landings, an immediate inspection revealed that the persistent ice which shunned heat and wouldn't imbibe was nothing more than a thick deposit of powdery white sea-dust. Fire hoses were broken out and soon the salt was on its way back to the sea.

Bees Swarm In Marine F9F

Puerto Rican Queen, Cohorts Routed

MAG-15, PUERTO RICO—To bee or not to bee was the main topic on the MAG-15 flight line recently when hordes of the little "stingers" invaded a *Panther* jet to set up housekeeping.

The group of several thousand bees had been roaming the local territory for several days when VMF-115 landed F9F's at Roosevelt Roads to take part in *Portrex*. They rendezvoused inside the plane's cowling.

BEE-HERDER MORTON SWEEPS SWARM FROM F9F

S/Sgt. M. P. Morton, a crew chief on one of the *Panthers*, reported he could handle bees so he was elected to rid the plane of them.

Prior to any maneuvering, Morton retired to a shower stall. This was explained as wise as well as welcome because bees get "riled up" when confronted with a person not absolutely spotless.

Donning a head net, long gloves and with trouser-tops stuck in shoes, the Marine bee-herder opened the cowling and proceeded to gather quite a following in a short time. With the aid of a brush, Morton swept the place clean after locating the center of activity surrounding the queen. Marine photographer, Pfc. L. M. Gargiglio, braved the buzzing insects to snap the accompanying photo.

Aside from a few die-hards who persisted in remaining, the *Panther* was free of the invaders and ready to fly within an hour after the routing.

Library Wants War Tales

Official Records Needed to Fill Gaps

A collection of the "Now It Can Be Told" records published by fighting units of the Army, Navy and Air Force has been recently established by the New York Public Library. Such a collection is bound to increase in value with the coming years.

Every effort is being made to have the collection complete, and Mr. C. E. Dornbusch, the Government Documents Division, will appreciate notification by any group as to the availability of its tour book.

Anyone interested in having the record of his fighting unit a part of the permanent collection should write Mr. Dornbusch, New York Public Library, Fifth Avenue and 42nd Street, New York 18, N. Y.

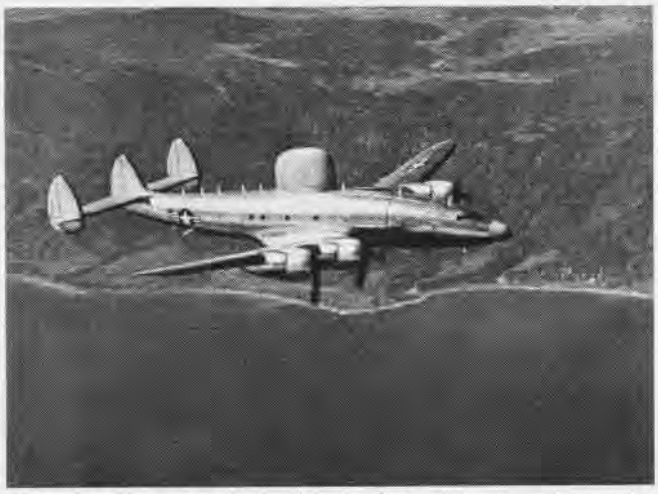
Corry PBY Saves Fishermen

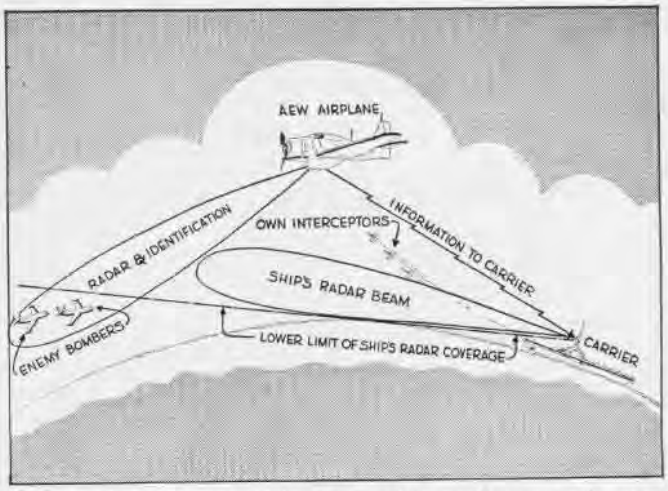
Craft in Gulf Sighted by O'Bryan

NAAS CORRY FIELD—Six fishermen lost in the Gulf overnight were sighted and rescued the next morning, thanks to the search and rescue unit's PBY piloted by Lt. George R. O'Bryan.

The overdue boat was last heard from six miles off the coast. The Coast Guard asked Corry to help the search. While on the second leg of the search, O'Bryan spotted the craft flying distress signals.

O'Bryan passed the word to radio Pensacola which notified the Coast Guard picket boat in the area. The PBY then circle the disabled craft until the boat took it in tow. The disabled craft had drifted to a position 32 miles southeast of Santa Rosa Island.





Once in *the extremely hush-hush class, airborne early warning can now be talked about. A new Navy flying radar laboratory, the PO-1W—a remodeled Lockheed Constellation—is making tests of AEW equipment and procedures. Because radar cannot bend around the earth's surface, putting radar in a high-flying plane will increase the range at which enemy ships or planes can be spotted. The modified Constellation has two large radome bumps midway along the top and bottom of the fuselage, plus a lot of antennas along its back, a bulbous nose to house more radar and a few extra antennas sticking out of its once-sleek fuselage.*

AND THERE I WAS ....

Fence-y Doings

SOMETIMES a man wonders if these new aviators and their fancy airplanes are going to have any fun at all.

Away back in 1944 a torpedo outfit was doing its rocket training at NAS SALTON SEA. One day one of the planes experienced engine trouble and landed at Thermal AFB, a dandy field if you like walking on live coals. The pilot discovered that the engine would idle only in spite of throttle position.

After a couple of Army mechs had ripped the cowling off and stopped and started the engine numerous times with no visible results, the pilot got curious. Poking around in the accessory section, he discovered that the throttle extension rod had dropped off the carburetor arm. This he remedied with a nut and a cotter key, but after he got his cowling back on he discovered that the plane wouldn't start. Primer had quit.

The Army said sorry, no primers. So the pilot took the top section of cowling off, took the air scoop off the carburetor, drained some gas from the bombbay into a bucket, and poured it into the open carburetor.

Smugly he leaped nimbly back into the cockpit and threw the starter to "energize." It groaned. Battery was dead. Army shrugged; sorry, no portable starters.

The pilot asked them to taxi their sole plane alongside. He disappeared out across the mesquite, reappearing shortly with two lengths of freshly-clipped barbed wire fence. These he connected up to the voltage regulators of the two planes. Repeating his unique priming operation, the pilot signalled

for the Army plane to wind up. It did. The barbed wires turned the color of a flank-speed Toastmaster, and the TBF starter suddenly came to life.

With the engine rolling sweetly, the pilot helped take off the wire before it turned into a puddle, said a prayer while he teetered up on the windy nose, putting his scoop and cowling back into place, slipped back into the cockpit, and soared back to Salton.

Nothing was really lost except some time and a farmer's fence—and that was squared. The pilot told the old boy he could skip next donation to the local Blood Bank.

BOB REILLY, Lt(jg)

SUN VALLEY, IDAHO

You Never Know

UP AT Kodiak, a lieutenant finally booked space for his wife aboard one of the VR-5 dependents' flights from Seattle.

Complications arose at Seattle, when the lady proposed to take a large Persian cat with her. After many patient explanations, she agreed to ship the feline by commercial

air and proceeded on the VR-5 flight without the cat.

Normal rough weather was encountered enroute to Kodiak. The lieutenant's wife, along with many other passengers, was more than a little airsick and was glad when the trip was over.

Days passed sans cat. Finally the reunited couple sought out the commercial airline agents to inquire about the missing animal.

Sadly the airline explained that the cat, too, had become airsick, and, without further ado, had been chucked over the side abeam the Queen Charlotte Islands. "Gosh," numbed the bewildered lieutenant, "what if my wife had been on that plane?"

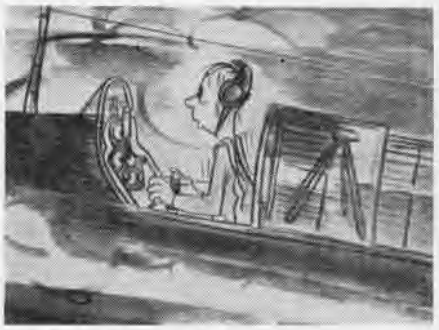
Where But Alaska?

CALL OUT the band for Lt. (jg) Leland, who claims to be the first pilot ever to back up to a perfect radio cone. And where could it happen but on VR-5's Aleutian run?

After once flying over the Adak range station, the plane proceeded outbound to shuttle to 5,000 feet. Upon slowing up, with flaps down, the pilots were startled to see the ADF needles swing from aft to ahead, with marker blinking and all audio manifestations of a cone.

The pilots retraced flaps, applied power and once again crossed the station normally. Nine minutes later the airstrip was seen directly below, indicating less than 20 mph groundspeed from the range to the field.

Adak aerology lends credence to the tale by reporting winds aloft of 127 knots and above at the time.



China Sea Comment

IT WAS A stinking day early in '45 in the China Sea. Several air groups were airborne for a strike against Hong Kong. A voice came over the air:

"Only a damn fool would fly in weather like this!"

Back came a prompt reply, "From one damn fool to another—Roger!"

Cdr. J. D. LAMADE

CAG-7

Officer, Arrest That Man!

A PLANE flown by a Naval Reserve pilot from NAS LINCOLN narrowly missed an automobile that had mistakenly turned onto one of the runways of the Municipal Airport just as the plane was landing.

Angry officials dashed to the car, but were silenced by an indignant lady driver. "Something is the matter with that plane," she told them, "it just landed in the middle of the highway!"

Moom Pitchers

FOUR AD-4's from VA-55 made a routine intercept on a B-36 bomber. Out of this exercise came an interesting sea story.

Several Navy pilots were attending the Arctic indoctrination school at Marks AFB, Nome, Alaska, and consequently had close contact with Air Force pilots.

As all loyal men should do, they constantly bragged of their B-36, until one day on of VA-55's pilots stopped them cold. Their conversation went something like this:

Air Force: Have you ever seen a real B-36?

Navy: Sure, we have pictures of it.

Air Force: What kind of pictures?

Navy: Gun camera.

Air Force: (thinking quick) Sure, jets can shoot it down.

Navy: We're flying dive bombers.

Air Force: Oh!

Needless to say, for the remainder of their stay, the B-36 was not mentioned.

● NAS CORPUS CHRISTI—A new way to start a football game—use a helicopter. At this station's fall homecoming game, instead of one team kicking off, a helicopter dropped the ball in the middle of the field. The team captains scuffled for it and the winner got the first chance at offensive play.

Marines Win Reserve Awards

LT. COL. SMITH, VMF-142 CO, RECEIVES TROPHY FROM GENERAL CATES

MARINE AWARD IS MADE AT NAS MIAMI AMIDST COLORFUL CEREMONIES

JUDGED the best *Flying Leatherneck* Reserve squadrons in the nation for all-around performance in 1949, VMF-142, NAS MIAMI, and MGCIS-19, NAS GROSSE ILE, have been awarded possession of the Marine Air Reserve Trophy for the coming year.

General Clifton B. Cates, Commandant of the Marine Corps, presented the trophy to Lt. Col. Roland F. Smith, CO of the fighter squadron, in a ceremony at Miami, while Major General Merwin H. Silverthorn, Director of the Marine Corps Reserve, made the award to Capt. Kenneth J. Mudie, CO of the intercept squadron, at Grosse Ile.

Runners-up in the competition were VMF-251, also based at Grosse Ile, and MGCIS-22, NAS GLENVIEW.

The 21-inch, solid silver trophy, mounted on a mahogany base, was given to the Marine Corps in 1949 by Herman H. Ridder, publisher of the *Dispatch and Pioneer Press*, St. Paul, Minnesota, and a major in the Marine Corps Reserve who saw action in the Pacific during the last war. It is awarded annually to the most efficient fighter and intercept squadrons on a rotation basis, with each squadron receiving miniature trophies for permanent retention.

In winning top honors in 1949, the champion squadrons had to overcome the spirited bids of 29 other fighter squadrons and 10 other ground control intercept squadrons under the Marine Air Reserve Training Command. Combat readiness, combat proficiency, availability of equipment, drill attendance, esprit, and administrative and engineering excellence all counted in the final scoring.

During their three years of post-war organization, the Marine Air Reserve fighter squadrons have clearly demonstrated that they are combat-ready units. On two-weeks summer maneuvers, conducted under simulated combat conditions, they have flown 4,112,240 miles in single-engine fighter craft without a single fatal accident.

In its ground control intercept squadrons, the Marine Air Reserve Training Command maintains the only organized training activity of its type among the nation's air reserves.

These units form a unique air combat organization, comprising mobile elements of electronic spotting, tracking and plotting devices, to locate approaching enemy aircraft and to direct interception by Marine fighter planes.

Unlike permanent electronic installations, Marine Reserve "radar" squadrons, are strictly front-line functional. Their equipment is specifically designed and packaged for quick transport by air, road, rail and/or water to advanced bases to work in liaison with Marine and Navy fighter planes operating from carriers or from newly-established land strips.

These squadrons are also constantly ready for service as mobile components of the defensive "radar screen" around the nation.

GROSSE ILE'S LT. COL. MAY AND CAPT. MUDIE

The present strength of the Marine Air Reserve Training Command is approximately 7,080 officers and men in 30 fighter squadrons and 11 ground control intercept squadrons based at 25 naval air stations in the country.

COC Training for Reserves

Combat operation center training is now being made available to Organized Reservists at 13 stations and NARTU's within the Naval Air Reserve Training Command. Electronic allowances for this purpose have been authorized under a recent CNO directive and the installations are now being made.

Naval air stations at Atlanta, Columbus, Dallas, Grosse Ile, Los Alamitos, Minneapolis, St. Louis and Willow Grove, as well as NARTU MEMPHIS, have each been assigned a major advanced COC. The installations at these commands will permit training with air targets (actual and/or synthetic) and surface.

An MGCI-COC allowance has been set up for Denver, Glenview, Olathe and Squantum naval air stations. This type installation will permit training with actual air targets only. However, special devices such as the 15-J-1B will make training with air synthetic targets possible.

The combat operation center unit at NAS WILLOW GROVE already has made successful tracking runs on its FH-1 aircraft with the SP-1M gear. The operation proved successful up to 20,000 feet and as far in as 30° elevation. Coordination work has also been completed and an operation plan adapted between the COC unit and the GCA unit.

CDR. CARL OLSON SIGNS UP E. F. MURRAY AS A NAVAL AVIATION CADET

RADM. A. K. DOYLE REVIEWS NAVAL AIR RESERVISTS AT NAS ATLANTA

Reserves Push NavCad Recruiting

With the recent transfer of Naval Aviation Cadet procurement program in the field to the Chief of Naval Air Reserve Training, naval air stations and NARTU's in the Reserve chain are exerting full effort to sign up eligible young men as future naval aviators.

NARTU NORFOLK is planning a refresher tour among colleges in the vicinity to supply dorms, fraternities and libraries with the latest NavCad literature and posters. NavCad spot announcements are slated to be used in an intensive campaign by radio stations in the area.

NAS BIRMINGHAM reports that the special edition of the NAVAL AVIATION NEWS, recently forwarded for use in connection with NavCad recruiting, has been distributed to local colleges and airports and that a follow-up campaign to sign up NavCads is now underway.

During January, NAS SQUANTUM swore in four NavCads and processed 12 more. Present plans call for a tour of local junior colleges, where the students have already become acquainted with the Naval Air Reserve via the copies of NAVAL AVIATION NEWS which are sent regularly to their school libraries.

Five NavCads were processed by NAS DENVER during January, while NAS MIAMI and NARTU MEMPHIS recruited two each. These, of course, are only a few of the results turned in by Reserve stations, but they indicate that Reservists are already on the ball pushing the new procurement program.

Reserves Get AM-1's

The *Able Mable,* formerly featured only on the Fleet circuit, is now joining the line of Reserve aircraft at six naval air stations in the Reserve chain.

Reserve pilots at NAS ATLANTA, NAS COLUMBUS, NAS DALLAS, NAS

RESERVES NOW FLY THESE POWERFUL MAULERS

GLENVIEW, NAS GROSSE ILE and NAS ST. LOUIS will now have a chance to fly this advanced type of operational plane during their regular drill periods. Already the first of the 82 AM-1's, slated for these six air stations, are in the process of being delivered.

Two enlisted men from each station have completed a short course of indoctrination in AM line operations at NAS PATUXENT RIVER, while two more from each station are in the process of taking training in maintenance of the AM's R-4360 engines at the Pratt and Whitney plant in Hartford. In addition, 12 men are slated to attend a short course in overhaul procedure given at NAS NORFOLK.

According to present plans, Glenn L. Martin company field representatives will work at each of the six stations getting the *Maulers* to help the Reserves learn to fly and service their newly-acquired planes.

The AM-1's hold the world's record for weight carried by single-engine airplanes. During tests off New York late in 1948, they qualified for daylight carrier landings and later made their night qualifications during maneuvers in the Caribbean Sea.

Station Round-Up

● NAS LOS ALAMITOS—United Airlines pilots are now being checked out on GCA procedures and landings. Reports from the first 40 to complete their check-outs indicate that they liked GCA even though it required a different type of orientation in flying from ILA.

● NAS OAKLAND—AVUA-6 has been commissioned at Sacramento with Lt. Jack W. Sellers as CO and Lt. Stanley A. Stark as executive officer.

● NAS MINNEAPOLIS—A snappy drill team of 40 men participated in the Grand Parade and the Torchlight Parade at the St. Paul Winter Carnival. Capt. Fickling, station CO, was honored as grand marshal of the Torchlight Parade. The station's portable field-lighting equipment led the evening parade, illuminating the massed colors. The truck sported a banner which read *The Naval Air Reserve Packs Peace Power.*

● NAS GROSSE ILE—All equipment used for training the AVUA at Grand Rapids has been moved from the quarters at the airport to the Naval Reserve Surface Training Center, where surface and air components are now working in close harmony. AVUA training gets a lift since the equipment of the surface division is now made available to the air reservists.

FASRON-735, with LCdr. Baden as CO, walked off with the John Womack Richey Trophy which is awarded each year to the most proficient squadron aboard the station.

● NAS DALLAS—Death has claimed one of naval aviation's pioneers. Chief Aviation machinist's mate Sol Siegel, well-known veteran of 30 years in the Navy and the Naval Reserve, who once served aboard the *Langley,* died in January.

● NAS ATLANTA—On 15 February, Rear Admiral A. K. Doyle, Chief of Naval Air Reserve Training, made his annual inspection of NAS ATLANTA—first station in the Reserve chain to be visited this year. Approximately 2400 Atlanta Reservists were present for the inspection. After the ceremonies were over, all hands attended a dance which featured Tony Pastor's band.

● NARTU ANACOSTIA—Twenty-five students from local high schools, winners and runners-up in the recent Naval Air Reserve essay contest, visited the U. S. Naval Academy at Annapolis as part of their award.

Headlights Save Pilot, SNJ

Port Townsend Lights Golf Links

NAS SEATTLE—It isn't every forced landing that is turned into a civic event, but that was the experience of Lt. (jg) Wayne A. Baumgartner who landed an SNJ at Port Townsend on 4 December.

He was on a routine flight from Whidbey Island to Seattle and was caught in a heavy snowstorm. The people of Port Townsend answered his call for help by illuminating an emergency landing strip by massing the lights from their cars on the golf course.

In appreciation of this life-saving act, Baumgartner flew an SNJ to Port Townsend later and RAdm. John Perry,

PILOT CALLS TO THANK PT. TOWNSEND HELPERS

Commander of Fleet Air, Seattle, presented to the Mayor, Harry E. Anderson a certificate in appreciation of the citizens' aid. In the photo above, Lt. (jg) Baumgartner chats with Richard Dale, seaman recruit, who guarded his SNJ on the return trip. Dale is a member of the Volunteer Naval Reserve Composite Unit 13-23 of Port Townsend, commanded by LCdr. E. C. Sherman.

ACI Reserves Visit Norfolk

Get Special 2-Day Refresher Course

Two hundred and thirty Volunteer and Organized Naval Air Reserve officers residing in the east attended a two-day ACI symposium at Norfolk, sponsored by ComAirLant.

Officers were billeted aboard the *Roosevelt*. Highlight of the conference, which featured lectures by CNO personnel, was a one day operational cruise aboard the *FDR*.

VAU 4-1 was one of the units represented at the symposium. Fifteen officers from this group attended. They reaped a further dividend, when transportation back to Willow Grove was provided for them on the *Constitution*.

Typical of the Reservists who were present was Lt. Luke Greene, member of WS-67, NAS ATLANTA, and city editor of the *Atlanta Constitution*.

● NAS NIAGARA FALLS—The assignment of several WAVE officers has helped squadrons take over their own administrative workload.

Figure this *one out? It is not a boy being sucked into an old Victrola horn or a whirlpool. Kenneth L. Newman, AD1 plane captain of an FJ-1 at NAS Los Alamitos, is checking the air intake as part of his job.*

NROTC To Learn Aviation

Midshipmen Spend Month in South

A long-range summer aviation training program for NROTC midshipmen, contingent on budget limitations, has been approved by Bureau of Naval Personnel.

During the coming summer, 1,894 junior midshipmen, divided into two groups, will participate in this year's cruise. In addition to two weeks of amphibious training at Little Creek, Va., each group will get four weeks of aviation indoctrination at Pensacola. This includes two weeks of academic aviation instruction, a week of practical aircraft maintenance training and a week of flight indoctrination. The first group will come aboard on 26 June, and the second 24 July.

NAS OAKLAND—The FJ-1 can fly fairly fast. One made it from here to Burbank in 35 minutes, averaging 638 mph.

The first *Regular Navy Wave to attend the parachute rigger's school at Lakehurst was Mary Redfern. During the war Waves there did not have to make parachute jumps, but Miss Redfern made one when she graduated from the school. She now is with the parachute issue room at NAAS Corry Field, Fla.*

Panther Sets Mark in West

Flies from SF to LA in Half an Hour

VF-112—LCdr. John L. Butts, Jr., executive officer of this squadron, set a new speed record between San Francisco and Los Angeles in an F9F-2, zipping south in 34 minutes and 54 seconds. His average was 585 miles an hour.

When he passed the Los Angeles municipal airport control tower, he was clocking 610. A tail wind of five knots prevailed throughout most of the run.

The previous record for the course was 36 minutes and 9 seconds, set by Maj. Robert DeHaven of the National Guard, flying an F-80C. CO of VF-112 is Cdr. Joseph T. Lawler.

From Clark *AFB, Manila, comes this picture of ADC Frank C. Dietchman being congratulated by LCdr. Herbert M. Young, CO of the Navy Detachment. He won two bowling prizes in the base league and the next day received orders to go back to U.S. on rotation.*

Gremlins Haunt Alameda

Strange Discs, Plots Stir Up Station

VR-2, ALAMEDA — Strange things have been happening around here.

On 6 February an object shaped like an ice cream cone was reported over the station by several observers. This renewed the flying saucer stories, and many and weird were the tales told.

On 9 February the PIO office received phone inquiries, asking "How come a *Mars* plane is doing loops over the Bay area?" Pausing a moment for reflection, the inquirer was asked, "Was it an outside or inside loop?" But no answer was forthcoming, other than it definitely was a *Mars*. A quick check on squadron planes revealed none with upswept wings.

Things were back to normal when at 0200 on 13 February a call was received from the station OOD that the Oakland fire department had overheard a whispered warning over an emergency phone circuit stating that the naval air station would be blown up at 0400.

Guards were doubled in the face of the unhappy prospect of crewless *Mars* planes becoming airborne, but come 0400 and no "boom" could be heard.

N.A. NEWS VISITS

NAS Akron

RESERVE PLANES FILL THE SKIES OVER AKRON

Captain E. L. B. Weimer, former CO of NAS Akron, and his party pass before officers during personnel inspection at commissioning of an Organized Reserve squadron

IT IS FITTING that the birthplace of the Navy's famed FG-1, a sprawling factory building near Akron's Municipal Airport, should continue to play an important role in the development of the Navy's air arm.

This building is now the home of NAS AKRON. Today, instead of manufacturing *Corsairs,* it is turning out a streamlined program for training Organized Reservists.

With all of its facilities concentrated in one plant, NAS AKRON is the largest naval air station under one roof. Remodeled and refurbished, it is a worthy addition to the nationwide chain of Reserve stations.

But when the first naval officers rolled into "Rubber Town" in the summer of 1947, the bleak factory building scarcely looked like a suitable location for the 24th station in the Naval Air Reserve Training Command.

In the advance guard were Captain E. L. B. Weimer, Pacific Navy Air veteran, and Commander Waldo C. Grover, his executive officer. As commanding officer, Captain Weimer's first job was to make the community Navy-minded, preparatory to the big campaign for enlisted stationkeepers and Organized Reservists.

His job was made easier by the fact that the northeastern Ohio industrial community took the Navy to its heart from the start. In fact, the response was so great that the stationkeeper billets were rapidly filled and the station was assigned a CVBG instead of the intended CVEG. Today the station supports an air wing and 11 squadrons for Organized Naval Air Reservists as well as a Marine Air Reserve fighter squadron.

On that bitter cold day in January 1948, however, when Rear Admiral I. M. McQuiston placed the station in commission before the original 100 plank owners, it looked like a long pull ahead.

Then LCdr. E. L. "Rip" Rowan, public works officer and Ohio University football player of the 1920's, and his men got down to the work of transforming the empty building into a live naval air station.

Classrooms were built; shops were constructed; and the gasoline tank farm was installed. Stationkeepers pitched in on hundreds of other jobs to bring the station through its gawky adolescence.

But it was not until 5 June 1948 that the community awoke to the tremendous change taking place on the southwest corner of its municipal airport.

On that date the station got its wings with the commissioning of its air group under the command of LCdr. Cook Cleland, ace fighter pilot who

Akron weather officer, LCdr. Frank Melewicz, shows operations officer, LCdr. W. K. Williamson, the new machines which receive nationwide weather maps by facsimile

Reservists Roberts AM2, McBride TD1 and Lt. West, tech training officer, appear on TV show telecast over television station WEWS

At Cherry Point, Brig. Gen. Gates briefs Lt. Gaberial, Capt. Handchey, Maj. Culp, Lt. Col. Tyler MAD CO, and 1st Lt. Wine

had served aboard the *Lexington*.

Ohioans knew Cook Cleland well both as a race pilot and as the Thompson Trophy winner in the National Air Races in Cleveland. Now they were to see him in action as CO of Akron's first weekend warriors.

THINGS REALLY began rolling then. Scores of wartime Navy and Marine pilots, anxious to keep up-to-date on the latest tactics, descended on the station from all parts of northeastern Ohio and joined the squadrons.

Navy Reserve planes soon filled the skies over Akron. The Marine's *Ace of Spades* squadron became a going concern under the direction of Lt. Col. Marshall A. Tyler, a member and later CO of the original *Ace of Spades* squadron.

Organized Reserve on-board figures soared and finally hit the 100% mark—and stayed there. This up-to-complement record put Akron out in front as one of the pacemakers among the 27 stations now in the Reserve chain.

In addition the station built up a big backlog of Volunteer Reservists, as well as a waiting list of men who wanted jobs as stationkeepers.

Community organizations, newspapers and radio stations all helped keep interest at a high pitch.

But the station didn't stand back and let the community carry the ball alone in regard to recruiting. Exhibitions of Reserve training equipment were held at colleges and universities, the most notable being the demonstration given for aviation school directors at Kent State University. The Reserve display of jet and reciprocating engines, radar and gunnery devices at the Centennial Wayne County Fair was called "the Fair's most outstanding exhibit."

Actual classroom sessions were telecast over the two Cleveland television stations to show the type of instruction the Naval Air Reserve was giving. In fact, Akron was one of the first naval air stations to utilize television for recruiting.

When Rear Admiral Richard F. Whitehead, then Chief of Naval Air Reserve Training, conducted the first military inspection of NAS AKRON in May 1949, he found operations on all fronts in high gear. He commended the station on the tremendous strides it had made since its commissioning.

By that time, Cdr. Grover had been moved up to CO of NAS SPOKANE, and Cdr. William L. Cleveland had replaced him. Upon Cdr. Cleveland's retirement, Cdr. Granville C. Briant, a graduate of the Naval Academy with the class of '29 and former exec at NAS LOS ALAMITOS, took over as exec.

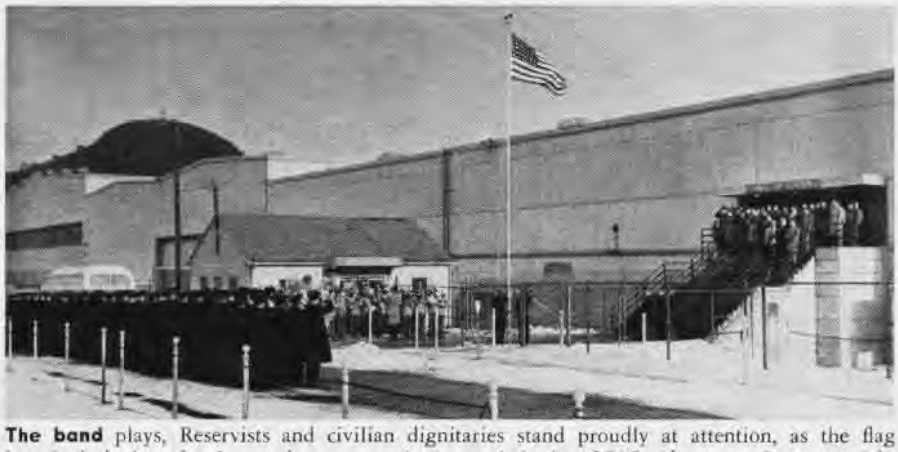
Meanwhile, Captain Weimer was chosen as Chief of Staff for the Naval Air Reserve Training Command at Glenview.

His replacement was Captain David W. Shafer, Naval Academy graduate with the class of '27, who had been associated with the naval air arm since 1930 when he took LTA training at Lakehurst. He came to Akron from NAS SAUFLEY FIELD, where he had also been commanding officer.

Captain Shafer, like his predecessor, has constantly encouraged the Reservists to take part in community affairs. So both officers and men play important roles in local fund-raising campaigns for the Community Chest, the Red Cross, the March of Dimes and other community projects.

Biggest effort came during the Christmas holidays of this year when more than 200 Reservists donned uniforms to help in the all-night drive to raise money for needy families. They collected approximately $15,000 from residents in the area and won plaudits from the Council of Social Agencies, whose member groups benefited from the proceeds.

Other cooperative activities have included a demonstration of Navy fire-fighting techniques, which the station fire fighters put on for some 1,000 volunteer firemen from nearby communities, and an eight-lesson course in aviation fundamentals given to 60 Air Scouts by the aviation technical training department. Both proved very beneficial.



The band plays, Reservists and civilian dignitaries stand proudly at attention, as the flag is raised during the impressive ceremonies commissioning NAS Akron in January 1948

Reservists McVicker, Orr, Bowers (below) work on engine of one of Akron's aircraft

All this has done much to cement the fine relationship that exists between the community of Akron and the NAS —"its newest and fastest growing industry" according to the local news commentators.

On the inter-service front, the station has become the official military host at the Cleveland Air Races and as such is the central arrival point for all visiting military planes.

During the three-day period last year, "The World's Smallest Airlift" ran continuously between Akron and the Cleveland Airport, with transports and additional personnel supplied by NAS GROSSE ILE and NAS COLUMBUS. Some 100 shuttle flights carrying more than 5000 military passengers were made each day.

Akron shared the pride of the whole Naval Air Reserve when three Reserve pilots were the first to cross the finish line in the 1949 Thompson Trophy Race. LCdr. Cleland was the winner for the second time and Ray McKellen, a Volunteer pilot at the NAS, placed third.

Keeping Organized Reservists in a constant state of readiness, of course, is the main business at NAS AKRON. With 75 planes and the latest types of training devices, the station is well set up to accomplish its mission.

Highlighting the training picture were last summer's cruises. Akron's carrier squadrons took part of their cruises at NAS GROSSE ILE, where they got in plenty of bombing, rocket-firing, strafing and gunnery. Backed by excellent support from the enlisted ground crews, pilots logged an average of 40 hours apiece during these cruises.

VMF-231 flew to MCAS CHERRY POINT for two-weeks of coordinated maneuvers with other Marine Air Reserve squadrons from the eastern half of the country. Akron pilots chalked up more than 700 hours. Two VMF-231 pilots checked out in FH-1 jets and two others qualified for standard instrument ratings during the cruise.

Like all Reserve stations, Akron has developed a special course for its seaman recruits. A feature of this training was the dockside indoctrination in shipboard nomenclature given 27 recruits through the cooperation of Cdr. Livingstone, inspector-instructor, Naval Training Center, Cleveland.

With the conversion of the air group into an air wing and component squadrons, which was completed in January, training at Akron is going more smoothly than ever.

More than 400 new billets were gained in the reorganization, and, in the usual Akron fashion, the enlisted complement is already filled. Today, 1,103 enlisted and 231 officer Naval Organized Reservists as well as 144 enlisted and 44 officer Marine Organized Reservists, come out regularly for weekend drill.

In addition, the station supports an associated volunteer unit at Pittsburgh, Pennsylvania, which has more than 200 members. It is also busy setting up a lighter-than-air Organized Reserve Squadron, which will provide training for some 150 officers and men.

But the clearest picture of the Reserve training program at NAS AKRON can be gained from looking at the flight hour figures. In the last six months of 1948, the year the station got its wings, Organized Reserve fliers were in the air 5,034 hours.

In the same period of 1949, the weekend warriors racked up a total of 7,879 hours. This sharp increase in the number of hours flown is not only a sign of the tremendous growth of the program but also a tribute to the fine teamwork that exists all along the line at NAS AKRON.

LCdr. Cook Cleland receives colors from Pat Allen as Meissner and McDaniel stand by

NAS Akron Air Reserve Squadrons

WS-65—Cdr. E. J. Sabol, WS Commander; Cdr. Clyde Schetter, Asst. WS Commander

VF-651—LCdr. W. L. Poland, CO; Lt. C. F. Mayer, Exec.

VF-652—LCdr. N. W. Dunzweiler, CO; Lt. K. P. Pearson, Exec.

VF-653—LCdr. Cook Cleland, CO; Lt. Raymond S. Edinger, Exec.

VF-654—Lt. J. D. Dragovich, CO; Lt. C. R. Mester, Exec.

VA-651—LCdr. V. J. Coletti, CO; Lt. J. A. Mavroudis, Exec.

VA-659—Lt. H. B. Davis, CO; Lt. C. W. Roth, Exec.

VC-651—Lt. F. B. Underman, CO; Lt. J. J. Hanley, Exec.

VP-651—LCdr. C. F. Jones, CO; LCdr. M. J. Conley, Exec.

VR-651—Lt. R. D. Whitmore, CO; Lt. T. H. Clemmitt, Exec.

FASRon-651—LCdr. P. J. Foley, CO; LCdr. H. B. Allen, Exec.

FASRon-655—LCdr. W. V. Gough, CO; LCdr. C. Chengelis, Exec.

VMF-231—Maj. Frank S. Hoffecker Jr., CO; Capt. Charles F. Hughes, Exec.

Some of the training planes used at NAS Akron are lined up before the air dock, former home of dirigibles Akron and Macon; Reserves use building that made famed FG-1's during the war

STREAM OF 'MIGHTY MOUSE' ROCKETS POUR OUT OF EX-GAS TANK, CONVERTED TO FIRE MISSILES

'Mighty Mouse' Takes Air

Rocket Has Folding Fins Attached

A new-type air-to-air rocket with folding fins, nicknamed *Mighty Mouse*, has been developed by Bureau of Ordnance. The new missile, slightly larger than the 2.25" SCAR practice rocket now used on aircraft, was built specifically for use with high speed aircraft, especially jets.

It was tested on an AD *Skyraider* at NOTS INYOKERN. Special rocket launchers are being developed by BUAER for use with *Mighty Mouse*, but in the California tests, it was fired out of an ingenious "package gun" consisting of open lengths of pipe mounted in a droppable gas tank.

The folding fin idea was tried out during the war to reduce air resistance on the plane and increase the carrying capacity of the launcher. Spin-stabilized rockets without fins also have been tried out on aircraft. The fins fold together while in the launcher and extend outward to their normal flight position when the rocket is fired.

HIGH MORALE SETS ARCTIC MARK

VP-1, ALASKA—It takes high morale on the part of pilots and maintenance crews alike to break flight records, as VP-1 did during January with 711 hours of operations in the Aleutian area. This is believed a record for P2V squadrons for one month's flying.

The squadron picked up its first 100 hours moving up from Whidbey Island. VP-1 had scheduled commitments for an additional 500 hours. This goal called for a combined effort by all hands. The existing record for the area was 550 hours.

Training, operation and maintenance schedules were prepared and carried out. A night check crew worked until 0200 each morning. The planes flew ice patrols of the Bering sea and covered the Navy-Marine Corps task element which landed on the sub-polar Alaskan peninsula.

Toward the end of the month, with the 600-hour goal in sight, word was received that a P2V squadron on the east coast flew 627 hours in one month. Flight crews and maintenance men strongly requested that this squadron beat the mark. A vigorous and renewed effort was made by maintenance personnel, who were imbued with the spirit and drive by an airman apprentice who wrote the following lines, and kept singing them on the hangar deck to the tune of "Tah! Rah! Rah Boom!! Tee AAA":

"In the land of ice and snow
VP-1 is hot to go
We don't need the sun and flowers
to fly seven hundred hours."

On 0800 on January 31, the maintenance department reported 100% availability. All nine aircraft took off and circled Kodiak in formation for an hour to salute the people most responsible for the attainment of the goal—the maintenance crews of VP-1.

Puerto Ricans With Marines

Annual Exercises See Services Mixed

Puerto Rican National Guard for Air flying F-47 fighters participated with the Navy, Marines, Army and Air Force in *Operation Portrex* in the Caribbean winter maneuvers.

The Puerto Ricans were attached to Marine Air Group 15 along with VMF-115(N)-533, the first flying F9F *Panthers* and the latter F7F night fighters. It was natural that the Puerto Ricans combine operations with the Leathernecks, who have been holding annual maneuvers in that area since the early 20's.

One of the VF-115's pilots is an Air Force pilot, Lt. Jesse Hearin, who is with the squadron as an "exchange pilot." A number of Marine fliers piloted F-84 *Thunderjets* in the maneuvers while attached to the Air Force under the same deal.

Marines Get New Transports

R4Q-1 Packets Supply Ground Men

Marine aviation has taken delivery on its first Fairchild R4Q-1 transports, the first use of the big *Packet* which has been in operational use by the Air Force for some time.

At Cherry Point, the *Packets* will be used by VMR-252, commanded by Col. Henry C. Lane. Two of the planes already have been delivered to the Navy at NATC PATUXENT. Marines will use the *Flying Boxcars* for normal air logistical support of their aviation and ground units, including supply by parachute. Marines no longer have paratroops.

The new-type Fairchild transports have two R-4360 P&W engines and can make 250 mph. Huge rear clamshell doors open on a truck bed level cargo compartment. It will carry 42 fully-equipped paratroops plus 20 500-lb. bundles of supplies or 35 litter patients. Maximum seating capacity is 64 men.

Could the *photograph above show a new type of cross-wing landing gear for Corsairs? It might be, but it isn't. When VMF-214 at El Toro recently inspected its F4U-4B's for torque scissors inspection, it found 32 out of 96 were cracked or showed signs of fatigue or both. The picture merely shows the wheels swiveled after the scissors had been removed.*

GCA Landing Wins Big Cake

El Toro Honors Pilot and His Talkers

MCAS EL TORO — Taking a page from the book of aircraft carrier squadrons, Marines here gave a 13-pound cake to 1st Lt. Marvin L. Berg, the 8,000th pilot to make a GCA landing here.

Sharing his cake with him were TSgt. Eldon E. Grebey and Corp. James R. Becker, who "talked him in." Grebey is the only enlisted final controller in the naval service at present, the job usually being handled by a flying officer. He got his special training at NATTC OLATHE, Kansas.

'Umpire' Rides Helicopter

Observes Fleet Exercise in Pinwheel

VP-34, NORFOLK — Every day the Navy is finding new ways to use helicopters. One of the newest is to fly observers who can plot all mine and bomb drops during fleet competitions.

This squadron operated off the AVP *Greenwich Bay* at Guantanamo Bay during January. It laid a full closure pattern at the entrance of the bay entirely by radar. The squadron got 34 direct hits out of 36 runs on the low altitude bombing exercises. One of the two misses was caused by a malfunctioning bomb release mechanism on the plane.

Official observer on the exercises was Capt. R. R. Briner, CO of the *Greenwich Bay*. He observed the maneuvers while hovering above the fine field and the bombing targets in a helicopter. This method proved effective as he was able to plot all drops with pinpoint accuracy and also was free to note over-all efficiency of the operations from this vantage point.

Corpus Bird on Instruments

Beechcraft Crashes Into It In Clouds

NAS CORPUS CHRISTI — An All Weather Flight School Beechcraft reports instrument flying has now extended to the bird world.

While climbing in a solid overcast at 1100 feet, the pilots felt a sharp impact. At the same instant they caught a fleeting glimpse of many large birds, perhaps geese going south for the winter, taking evasive action.

Flight characteristics of the plane appeared normal, and check of the controls indicated it apparently was not damaged seriously and flight was continued. On return to base, it was found the impact ruptured a rib in the leading edge of the starboard wing main panel, necessitating a wing change.

Birds often have been sighted above overcast, but this was the first time they have been encountered on instruments.

BEWARE OF JET HOTFOOT

23-FOOT BURNED-OFF AREA ON QUONSET RUNWAY SHOWS HOW JET HOTFOOT CAN MELT ASPHALT

THE NAVY has its "hot" jet pilots, it has its "hot" planes which make "hot" landings. It also has its jets that can make "hot" takeoffs, too, which burn the asphalt covering off the runways.

The accompanying photograph shows what happened to runway 10 at NAS QUONSET POINT when one F9F pilot made a prolonged full power run-up prior to releasing his brakes for takeoff. MCAS CHERRY POINT and NAS SAN DIEGO report they have had similar occurrences.

Everyone knows how soft the asphalt paving gets downtown on a hot summer day. Some Navy jets shoot their exhaust straight out the back, but the F9F has a slight downward tilt to its fuselage which shoots hot gases against the asphalt, blowing it off the runway if the run-up is too long. Similar troubles with jets are also being studied aboard aircraft carriers where the hot blast melts the pitch and asphalt in the deck caulking.

Similar but less extensive damage to that shown in the photograph has been done to other runways at Quonset by a few F9F pilots. No damage has been inflicted in the warm-up areas and none has been observed following normal takeoffs. Unlike propellered planes, jet engines require no warm--up period but may be delayed at the take-off spot by heavy traffic.

Since the majority of F9F pilots use a take-off technique that does not damage the runways, it appears that this damage can be avoided. Bureau of Yards and Docks and BUAER both are studying the problem.

The problem of hot jet exhaust on carrier decks, especially at the catapult spot, is being studied by the Ship's Installations division of BUAER.

It was found that the 500-degree heat coming out of the tailpipe for several minutes while the plane is being positioned was deleterious to the deck. This is especially true of the F9F. The FJ, FH-1 and F2H sit with their jet exhausts more nearly parallel to the deck. However, to get a better launching angle from the catapult, studies are being made to raise the nose of jets, which would direct the blast at a sharper angle downward.

A project has been launched at the Naval Air Material Center, Philadelphia, to develop an automatic deflector plate for installation on carrier decks behind the catapult. Rather than throwing the jet exhaust only upward, it also would turn it outboard. It was felt a deflector which throws the exhaust upward would not protect the deck sufficiently because of wind over the deck.

This deflector plate would have to be designed to retract into or against the deck when not in use. It would have to be constructed so that it would not overheat and burn tires of planes taxiing over it. The F6U and F2H jets have been tested at NAMC in connection with this deflector plate project. The F7U twin-jet *Cutlass*, which squats on the deck at a much greater angle than any other Navy jet, might introduce new problems of possible deck damage, as well as on asphalt runways on land.

NAS NIAGARA FALLS — VF-852 played weekend hosts to Royal Canadian Air Force Squadron 400 which arrived in 12 planes. The RCAF was made to return the goodwill visit which VF-852 made to the (Toronto) Airdrome.

FIRST RAFT RIDER SAT 5 DAYS

WHO WAS the first naval aviator to make extended use of his life raft when forced to ditch in the ocean?

Possible claimant to that honor, a man who spent five days floating around the Pacific off Panama, is Chief Aviation Pilot Verne W. Harshman. Records of his feat came to light in BUAER airborne equipment division recently.

On March 17, 1931, while flying cover for battleship spotters, Harshman got lost in his fighter when clouds closed in. He made a water landing, inflating flotation gear on the two wings and breaking out his Mk 1 life raft. BUAER had just developed the raft a few years before.

A few hours later one of the flotation bags sprung a leak and the plane partially sank. Harshman fired four Very stars with no results. Biggest bother was the sharks. He managed to keep them from spinning his life raft around too much by using his oar as a spear and hitting them in the head. Numerous spotted dolphins rubbed on the raft.

Since he had only one canteen of water, to conserve it he caught rain water in his silk scarf, fashioned as a crude funnel. On his fourth day at sea the sun was so hot it started to melt the rubber in the raft. One leak was started, but he patched it and kept the spot wet and covered it with a flag.

That night Harshman sighted a ship's masthead lights. He fired his last two Very stars but they were unnoticed. He met the captain of this ship the next week ashore and shook hands with him. The captain said, "Jesus Christ put me off my course 30 miles to pick you up and I had to be asleep when the time came!" A colored native seaman who was on watch that night reported he saw "two falling stars" and thought it queer they were red.

On the fifth day he sighted a ship, the USS *Cerigo* of the Hamburg-American line. He waved his red flag at it. The captain later said he thought it was a cormorant sitting on a log flapping his wings. However, the ship finally picked him up and hauled him aboard. They gave him a drink of schnapps "which nearly blew the top off my head," he reported.

Harshman was ravenous but his stomach had shrunk so he could hold only a small amount of food. He had to leave the table hungry although he felt full up to his neck. A number of Harshman's recommendations, including placing of cement and tools for raft repair, plus a cord to tie the oars to the raft, were put into effect later by BUAER after studying his report.

One of the *Navy's top submarine-killer squadrons, with five U-boats to its credit, was among the 35 decommissioned recently VP-40's service ranged from Iceland to Panama, plus time in the Pacific. One of the subs sunk was captained by Kapitan Leutnant Guggenberger, who had been decorated by Hitler for sinking the British aircraft carrier Ark Royal. Members of the squadron at the decommissioning were, left to right, front row: Lt. H. T. Hitchcock; Lt. (jg) J. N. Price, W. G. Hatfield, ADC(AP); Ens. J. D. Fuller, Lt. E. C. Tipton, Ens. D. B. Riley, Lt. (jg) J. E. Langille, Lt. (jg) R. L. Carlson, Lt. (jg) J. C. Masters, Lt. A. T. McKinney, Lt. T. C. Beavers, Lt. R. D. Gless. Back row: Lt. M. G. McKinney, Lt. (jg) J. Henson, Ens. W. W. McCue, Lt. W. J. Everett, Lt. (jg) W. P. Page, LCdr. H. L. Grant, LCdr. J. P. Lynch, exec; LCdr. W. D. Harrington, CO, LCdr. R. R. Sparks, LCdr. C. H. Talbert, Ens. W. C. Sharpe, Ens. G. Brown, Ens. J. H. Pressley, Lt. D. S. Good. "Duffy" Riley, squadron mascot, is in front, tongue out.*

LATEST P2V FOR ASW WORK HAS RADOME, TANKS

ASW Neptune is Revealed

P2V-4 Carries Radar for Search

A new version of the Lockheed *Neptune* has been announced—the P2V-4—specially equipped for sub-killer missions, one of the primary missions of naval aviation.

Holder of the world's long distance flight record, the P2V combines long range with the ability to carry a heavy load of armament plus antisubmarine warfare gear. Just what this latter gear is cannot be told, but external views show the *Neptune* with a large radar guppy on the belly and wingtip tanks which may contain additional gear or fuel.

To assist in locating submerged submarines, the P2V-4 will carry radio sonobuoys. The bomb-like buoys are dropped in the area where a sub is suspected to be. A microphone in the buoy picks up sounds from the submarine's propellers and rebroadcasts this information to the P2V, which they can get a plot on the sub. The plane can carry torpedoes, depth charges, bombs, rockets and cannon to attack any submarine it can locate. It is powered by the Wright "compound" engine which uses exhaust gases.

Quonset to Launch Carrier

Model Patterned after 'North Island'

NAS QUONSET POINT—The Navy will launch an *Essex*-class aircraft carrier here on Armed Forces Day, May 20, complete with air group, guns that fire and bullhorns that work.

Of course, it is only a model of an *Essex* carrier, a 56-foot long one weighing 12,000 pounds. Built along the lines of the USS *North Island* (NANEWS, Feb. 1950) which has been appearing at civic functions around San Diego the past two years, the USS *Quonset Point* was built entirely by military personnel from surplus and salvage material.

Launching ceremonies are planned when the little carrier is ready to take to the water. It will have actual water flowing past her bows, a continuous-flow water pump supplying it with a miniature bow wave, Her tiny guns will fire talcum-powder puffs and a synchronized phonograph record will provide the saluting battery in action.

Patuxent's Snazzy Tower

FOUR MEN MAN POSITION IN NAS, PATUXENT'S NEW TOWER WHICH WILL INCLUDE GCA AND ILS

PERCHED atop the operations building at the Naval Air Station, Patuxent River, Md., is a control tower that any air activity would be proud to own.

Completed and placed in operation last October, the tower has four positions and will eventually include fixed GCA and fixed ILS installations. The control console is designed especially to meet the requirements of over all traffic control. It contains new and improved features so designed that it can be adapted to and become standard equipment for all Navy control towers. Basic facilities are incorporated also to allow for future installation of electronic traffic control.

Origin of the project dates back to November of 1948 when, at the request the CO at Patuxent, BuShips undertook to modernize the tower. It was soon recognized that this was an opportunity to initiate a long range program to develop and install a complete electronic control system.

The job of designing the control console was assigned the Electronics Branch of the Naval Gun Factory in Washington. Objective kept in mind was that it would have to be an over-all control setup combined with GCA and ILS.

Personnel of the Patuxent tower helped with the design by recommending certain features which would aid in the efficient and safe control of air traffic. The whole installation was expedited through work conducted by the Communications department of the station, the Public Works department, Airport Lighting Section of Electronics Test and the Operations department.

The console is divided into four main positions, stands A, B, C, and D. This breakdown permits control of a variety of traffic with little clutter and interference within the tower. Volume of traffic determines how many personnel man the installation at one time. Four controllers are on the job in rush periods, two during slack periods.

OPERATOR "A" monitors the normal tower frequencies and controls all contact traffic within the landing pattern of the field. The "B" stand operator monitors all the normal CAA and instrument traffic control frequencies for relay, information, etc. to civil and military aircraft flying the airways.

Controller "C" stands by operations frequencies and controls target assignments, radio range practice, GCA assignments, lost plane procedure, etc.

ON DECK BELOW TOWER ARE PANEL RECEIVERS

Operator "D" mans the intercommunication and landline facilities connected to Military Flight Service and the CAA's Air Route Traffic Control. A supervisor, qualified in any position, sees that the whole team does its work smoothly.

For variety of traffic, including test aircraft of all sizes and description and MATS planes, Patuxent is hard to equal. This new tower adapts itself readily to any conceivable situation.

When installations are completed the tower will be the best equipped in the U. S. and perhaps the world. Equipment includes a medium range surveillance radar, improved type VHF direction finder, MHF direction finder, two radar height finders and emergency radio equipment. To avoid local electrical interference two duplicate remote receivers are located several miles away on Cedar Point.

Rather than have receivers and transmitters on the tower level the racks are on the level below where they can be worked on without interfering with operations.

Through the elimination of much noise and radiation interference and providing a clear cut division of responsibilities and duties of the operators, Patuxent's tower is a dream of efficiency and a pleasant place to work.

DECK ALSO HAS RECORDERS & RANGE CONTROLS

- NAS Minneapolis—Waves have been contributing their talents for office and maintenance work on regular squadron cruises. Eight enlisted Waves and two officers accompanied Air Group 65 to Pensacola and six enlisted Waves cruised with Air Group 93 at Bemidji.
- NAS Jacksonville—The former executive officer of the Japanese cruiser *Sakawa* is with VF-133 here now. No, he isn't a Jap, he's LCdr. Jesse Miller. After the war he volunteered to be exec of the ship when it went to Bikini for the atom bomb tests.

Neptune Has A New Sight

P2V-4 aircraft now being delivered from Lockheed Aircraft Corporation are equipped with *optical illuminated sights Mk 8 Mod 8* which have an *adjustable reflector Mk 7 Mod 0.*

The reflector on these new sights replaces the adjustable reflector Mk 4 Mod 0 used on earlier versions of the *Neptune* series aircraft. It furnishes a direct reading of the adjustment scale and perfits a greater downward movement of the reflector plate than was possible with the adjustable reflector Mk 4 Mod 0.

Installation. It is not planned to install this newer sight retroactively in P2V-2 or

PILOT INSPECTS OPTICAL ILLUMINATED SIGHT

P2V-3 aircraft. BuOrd, however, will not object to field activities installing the adjustable reflector Mk 7 Mod 0 *when replacement is required.*

Illuminated sights equipped with the adjustable reflector Mk 7 Mod 0 are available in the aviation ordnance supply system under Stock No. J942-S-3114-140.

Safety Lock for F8F Tail

NAS Alameda—A safety lock for the F8F tail gear, fabricated to fit the hydraulic oleo, has been developed by K. C. Black, aircraft mechanic general, under the Navy Employees' Beneficial Suggestion Program.

The lock is a mild steel jacket ⅜"x6" equipped with a locking pin, secured around the oleo piston shaft. Thus, the oleo is secured in an extended position regardless of whether the hydraulic system is functioning or not.

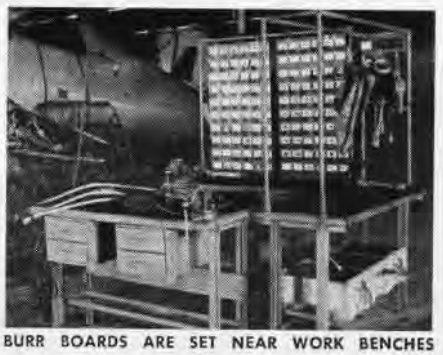
It also eliminates necessity of blocking up the rear of the plane each time it is moved, and eliminates the danger of the plane being jarred off the blocks with possible injury to personnel working under it.

Photography Aids Overhaul

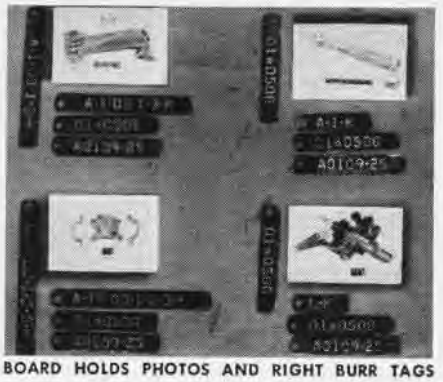
Photography is playing an important part in the overhaul program. As part of an efficient procedure that simplifies overhaul and repair, it is paying off real dividends.

About three years ago, the use of embossed metal burr tags for routing and processing aircraft parts undergoing overhaul was adopted in the Overhaul and Repair Department at NAS San Diego. These burr tags identify the parts with basic subassembly, specify routing and processing information, designate the shop or shops responsible for processing the part, and give other information necessary to carry the part through the overhaul cycle.

The use of these burrs effected definite



BURR BOARDS ARE SET NEAR WORK BENCHES



BOARD HOLDS PHOTOS AND RIGHT BURR TAGS

economies through eliminating the use of written directives; standardizing routing and processing; designating and defining responsibilities.

But there were problems to be solved before the project could be completely effective. One of these problems was to provide a means of easily and accurately identifying the parts of the subassemblies as they were removed from the aircraft and attaching the proper set of burrs. To burr these parts properly by first checking against written descriptions or blueprints would entail duplication of effort, considerable loss of time, and require the services of highly trained personnel for the job. After discussing the matter fully, directors agreed that pictures of these parts with the correct set of processing burrs would solve the problem. Photography was the answer.

Inexpensive photographs of parts and subassemblies were prepared and burr boards were set up in the various subassembly shops. Since the burr tags are pre-punched by the thousands, it became a simple matter for personnel to attach the proper burrs to the subassembly by making a visual check of the burr board.

With the aid of photographs, accurate burring of parts is no longer a problem.

Night Lights for Pinwheels

Helicopter Operation in Dark Tricky

HU-1, Hawaii—This helicopter squadron's Hawaiian detachment has developed landing and instrument panel lights so it can operate its egg-beaters at night.

A detachable R4D landing light was mounted on the step brace of an HO3S-1, with the direction of the light adjustable as desired by the pilot. Standard instrument lights were installed on both sides of the instrument panel.

Considerable training is required before a pilot is capable of hoisting a man out of the water while hovering at sea during darkness. Contact condition with lights for a reference are required for all night hovering at sea. Lights from ships, a shoreline, light houses and the like can be used. LCdr. E. A. Arnold, Jr., Lt. (jg) S. K. Schmucker and Lt. (jg) W. J. Cox of the detachment made the first night training flights. After becoming capable of hovering at low altitude over objects at sea, during darkness, they considered themselves qualified for night rescue.

PILOT CAN USE SEARCHLIGHT ON NIGHT FLIGHTS

During the past year, numerous night flights have been made by four different pilots for search and rescue. On 14 November, the helicopter was used on an all-night search for an F7F reported ditched near shore. The maximum distance flown off shore by the helicopter is 14 miles. The helicopter proved valuable for identifying objects on the surface seen from conventional aircraft, thus preventing a waste of time in otherwise identifying these objects at night.

Quonset Hut Flown North

Transport Squadron lifts Heavy Gear

VR-5, Seattle—You get some funny cargoes when you fly Logistic Air Wing planes, and a couple of recent shipments to Alaska were no exception.

The Navy's Petroleum Project Four at Point Barrow, northernmost point in Alaska, wanted a specially-designed cold weather Quonset hut. The hut was at Point Mugu, Calif., so two R5D's picked up the 17,053-pound cargo. The bulky Quonset filled the cabins entirely and it took extensive planning to get it all aboard two planes. On the return trip they brought 68 passengers from Anchorage to Seattle.

The second unusual shipment was 18,716 pounds of seismographic instrument gear from Los Alamitos to Point Barrow. On the way back, the two planes provided lift for 66 passengers at Anchorage.

● NAS Columbus—During December, 26 men successfully completed the high school level GED tests and 3 the college level tests.

13 Blind Boys Tour Alameda

Show an Aptitude for 'Flying' Links

NAS ALAMEDA—In the public information office is a letter of appreciation written in Braille. It was sent by 13 blind boys, students at the California School for the Blind, to thank personnel who had helped make their recent all-day guided tour of the station an outstanding experience.

During their tour, the boys, some of them blind from birth, visited the control tower. They examined a JRB-4 from wingtips to cockpit. They swarmed over the *Mars*, which was "like a flying house" to them. At the aviation ground school, they operated Link trainers and "saw" machine guns and model ships with their finger tips.

Most noteworthy to their guides was the way the boys "flew" the Links after brief instruction. Most of them achieved near perfection in banks, turns and beam flying. They had picked up by sound and touch the things normally gained through sight.

Questioned regarding aviation, the boys surprised everyone by disclosing a concept of flying almost identical with that held by technicians to whom planes are a visible reality.

After the visit their school instructor made the following comment: "When you're without sight, the world can be very narrow unless you're able to come in physical contact with the concrete objects you hear about. These kids went over your gear with a fine-tooth comb, and have a broader world because of it."

Needless to say, the world is also broader for many station personnel, who, perhaps for the first time, realize it's not so much what you see as how you see it.

BLIND STUDENTS EXAMINE AIRCRAFT MODELS

Fighting *Squadron 193 was commissioned on 29 August 1948. Recently the squadron initiated Plank Owner certificates for all hands present on the day of commissioning, as an event to be long remembered and propagated when old hands spin sea stories.*

Letters Reward Good Shots

ComAirPac Planes Show Records

VP-4, PACIFIC—ComAirPac has a new system of marking aircraft whose pilots and aircrewmen have made good marks in gunnery.

If they receive an "outstanding" mark in scheduled primary or secondary weapons competitive exercises they can display a white "E" on the fuselage below and forward of the pilot's window. The "E" will be followed by a smaller letter (B, G, or R) about one-third the size of the "E" to designate whether the mark was attained in bombing, gunnery or rockets. The "E" will be followed by more than one letter when the pilot or aircrew has won the award in more than one weapon during the fiscal year. A hash mark will be displayed under the "E" to indicate the number of years the plane wins the letter.

PAINTED LETTERS ON FUSELAGE DENOTE WINNER

VP-4 has nine P2V-2's which have won eight "E's". Five are displaying the letter followed by a B and R. One plane has a hash mark below B and R.

Heat Control on AD Planes

Several complaints have been received by BUAER from operating squadrons regarding inadequate temperature selectivity in the cockpit of AD-2 and AD-3 aircraft.

Recent information from Douglas Aircraft Co., reveals that intermediate positions are provided for the heating and ventilating controls in these planes through use of a friction adjustment. This adjustment is located below the upper surface of the right-hand control panel.

Any desired tightness of the control levers can be obtained by removing the cotter pin from the outboard end of the control lever shaft assembly and tightening the shaft against the leaf-type spring of the control assembly.

A 10 to 15-pound force applied near the top of the control handle in a fore and aft direction to initiate movement of either control, is recommended as a satisfactory adjustment to provide intermediate positions for partial output.

The next issue of the *Erection and Maintenance Manual* will be revised to include detail instructions for adjusting the friction control. In the meantime, the information presented herewith should be sufficient to enable maintenance personnel of operating squadrons to make adjustments as required.

All-weather *flying is all the rage in the Navy today and one of the leading exponents of that art is VMF(N)-533, late of Edenton and now at Cherry Point. A frequent contributor of time and money-saving ideas for the News to spread to other squadrons, VMF(N)-533's pilot roster above is, left, front row: Capt. R. R. St. John, Capt. H. M. Turner, Maj. S. G. Gier, exec; Maj. B. C. McElhany, Jr., CO; Maj. E. P. Dunn, Capt. D. D. Hunter, Capt. L. T. Frey. Back row: Lt. L. B. Matthews, Jr.; Lt. G. L. Davis, Jr.; Lt. J. H. White, Capt. L. A. Miller, Capt. G. O. Ross, Lt. A. J. Ward, Capt. H. N. Mehaffey, WO J. A. Corvi, Lt. D. W. Grayheal. Missing were Capt. G. A. Krumm, M/Sgts, W. W. Wamel, E. L. Baumwart.*

SERVICE Test INTERIM REPORT DIGEST

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

F2H-1 (318 Hours)

Carbon Deposit. Large cakes of carbon were found in the engine combustion liners after AN-F-58, JP3 "referee" fuel was used for 25 hours. AN-F-58, JP3 (Z-1) fuel, which is now in use, also leaves considerable carbon deposited in the combustion liners.

Turbine Housing and Spacer Ring. During a routine "B" maintenance inspection of engine WE 20234, the first and second stage turbine blade tip clearances were found to be below the specified minimum (.060") in a number of positions.

After replacement of the turbine housing and the turbine spacer ring, the turbine blade tip clearances were satisfactory.

The cracked blade in the first stage turbine on engine NO. WE 20234 after 226 hours of operation is being investigated.

F9F-2 (360 Hours)

A thrust stand test made with J42-P-4 engine after 301 hours, revealed that the static thrust had dropped to approximately 4300 lbs., a loss of 400 lbs. The engine was removed from the airplane for inspection, and another J42-P-4 engine was installed.

The following discrepancies were reported to the Board of Inspection and Survey:

Combustion Chamber Liners. Failure of the combustion chamber liners after 123 hours were reported. The liners were replaced. A major inspection of the engine after 180 hours revealed that each combustion chamber liner had buckled at the window piece and on the inboard side of the upper cylindrical section and that cracks had developed in number 3, 6, and 7 liners. Since the installation of these liners, this engine had been operated 60 hours on AN-F-58 fuel. It is noted that all failures of the liners have occurred in approximately the same position, on the inboard side between the interconnector tubes. *Recommendation:* Investigate and correct the cause for the failures of the combustion chamber liners.

Cabin Pressurizing and Cooling Hose. The cabin pressurizing and cooling hose failed on two occasions. The first failure occurred after 105 hours, and the second failure, after 195 hours. Both hoses failed near the end which is attached to the engine. *Recommendation:* Provide a satisfactory cabin pressurizing and cooling hose.

Voltage Regulator. During flight, at 25,000 pilot noticed smoke in the cockpit, and he immediately returned to the field. When the landing gear was lowered, the indicator did not show that the gear was down because the indicator circuit breaker was open. When the circuit breaker was pushed in, the indicator showed that the gear was down.

Post-flight inspection revealed that several other circuit breakers were open. Photographs, taken prior to failure of the camera, of a photo panel installed in the nose section showed that 30 minutes after take-off, at an altitude of 25,000 feet, the voltmeter reading went up to 30+ volts and stayed there. The voltage regulator test pin jack was badly burned. It is believed that a short circuit in the test pin jack caused the voltage regulator to malfunction and allow the generator to deliver excessive voltage to the circuits. The voltage regulator operated satisfactorily on a subsequent bench check.

All damaged parts were replaced and the voltage regulator test pin jack was turned over to the Grumman service representative for investigation.

Exhaust Assembly. During an engine check of 242 hours, the after flange of the exhaust assembly was found cracked.

P4M (26 Hours)

Acceptance Check. During this check, competed on 25 January, changes specified in J-33 BULLETINS NO. 30 and NO. 35 were incorporated in the jet engines by the Allison representatives. The high pressure fuel system was converted to low pressure, and modified exhaust unit assemblies were installed.

G. L. Martin personnel also completed the following "open" items during this period: The P-1 autopilot was modified; damper linkage connecting bolts and bushings for the nose wheel, modified to include lubrication fittings, were installed; and the main gear uplock mechanisms were reworked in accordance with Martin Factory Change Record 425. The propeller governors were removed, and modified governors installed by the Aero Products representatives.

The following discrepancies were reported to the Board of Inspection and Survey:

Ammeter. The ammeter in the main battery bus circuit failed. Total operating time 5.7 hours.

Battery Filler Caps. The top covers of 17 of the 24 battery filler caps installed on the two batteries were found to have come loose and were lying on top of the batteries. Total operating time 5.7 hours. *Recommendation:* Provide satisfactory battery filler caps.

Voltmeter. The voltmeter in the circuit from the number 1 alternator failed. Discrepancies under investigation:

1. Broken transparent plastic shield inboard of the valve assemblies for the emergency operation of the bomb bay, landing gear and flaps.
2. Broken exhaust clamp and bolt.
3. Failure of the cabin heater vibrator and fuel valve solenoid.
4. Failure of the drive shafts on both alternators on number one engine.
5. Failure of the drive shaft on the hydraulic pump on number two engine.
6. Oil leak in the hydraulic pump gear box adaptor on the number one engine.

AD-4 (205 Hours)

Correction. Engine temperature control diagram, fig. 8-16, page 529, of E&M Handbook for AD-4 is incorrect. Information listed under the heading *Actuator* "Y" should read: A—Extend-close; B—Ground; C—Retract-open; E—Transfer switch; Motor Rotation "X" and "Y": A—Counterclockwise; C—Clockwise.

WAC Test. When the engine rear section was checked by the Wright Aeronautical Corporation, two PR58U1 carburetors were also checked. The first carburetor was installed but the engine would not operate properly. The carburetor was flow-checked locally and settings were found to be below the specified minimums, although the Wright Aeronautical Corporation flow sheet showed that the carburetor had been set at the minimum, or just above. Another carburetor was installed, and the engine operated satisfactorily, except at certain cruiser powers where roughness was encountered. This carburetor has been removed and sent to the Aeronautical Engineering Laboratory to be flow-checked.

The following discrepancies were reported to the Board of Inspection and survey:

Gasket on Oil Sump Drain Plugs. After 168 hours of operation, oil was leaking from the sump magnetic drain plug and from the sump drain plug. The plugs were removed and the following discrepancies were noted:

1. A metallic gasket was installed on both the magnetic drain plug and the sump drain plug, but the group assembly list for the rear oil pump and sump shows that a gasket is required on only the magnetic drain plug.
2. The gaskets and "O" rings on both drain plugs were deformed.

It is questionable whether the gaskets are necessary to prevent oil leakage from the drain plugs. The gaskets can be easily deformed when the drain plugs are tightened.

Remedial Action: Removed the gaskets from both the sump drain plugs and used only "O" ring seals. *Recommendation:* Investigate the necessity for the use of gaskets on the oil sump drain plugs.

Engine Temperature Control. After 128 hours, the filament of the voltage regulator tube failed. There have also been previous reports of failures of the voltage regulator tube. A satisfactory voltage regulator tube for the temperature control unit is needed.

Rear Cowl Flap Actuator. After 77 hours, the rear cowl flap actuator failed. Investigation revealed the following discrepancies:

1. One of the leads to the motor was ruptured where it had chafed against the motor frame, and the motor was burned out. The anti-chafing strip on the lead was too short to prevent chafing. The leads of a new actuator obtained from the Douglas Aircraft Company had no anti-chafing strips installed. The serial number on the new actuator was lower than that on the actuator that failed.

2. The output shaft drive gear binds on the castellated nut on the end of the worm wheel cross shaft.

As remedial action, anti-chafing strips were placed on the leads of the new cowl flap actuator prior to installation.

Recommendations:

1. Provide adequate anti-chafing strips for the actuator terminal leads.

2. Install the nut on the worm wheel cross shaft so that it will not contact the output shaft drive gear.

Under Investigation. The malfunctioning of both brake power boost cylinders is being investigated.

F2H-2 (15.9 Hours)

F2H-2, Bu. No. 123223, was received on 23 January 1950. An acceptance check was conducted, and the flight phase of the test has begun. No discrepancies have occurred in flight.

Brake Assembly. When the main landing gear wheels were removed to repack the bearings, eight brake linings in each brake assembly fell out of the housings. The time required for two men to reassemble the brake assemblies was approximately three hours.

It is necessary for a mechanic to depress the brake pedals in the cockpit from the time the wheels are removed until they are replaced in order to hold the brake linings in position. *Recommendation:* Provide a satisfactory brake assembly.

AM-1 (179 Hours)

The flight phase of this test has been delayed owing to maintenance time trials which were held during this period to coincide with an AM-1 maintenance training program for Naval Reserve personnel conducted by this activity. The following discrepancies were reported to the Board of Inspection and Survey:

Manifold. The ignition lead to the rear spark plug on cylinder number 4D chafed against a stringer of the lower cowling. The contractor had apparently made a small cutout in the stringer in an effort to prevent interference with the ignition lead. *Recommendation:* Provide adequate clearance between the cowling and the ignition leads.

Elevator Assemblies. BIS 21125 ITEM NO. 8-10 reported the replacement of loose cherry rivets with brazier head rivets on the trailing edges of both elevators. Several brazier head rivets failed, and adjoining surfaces of the elevators cracked after 25 hours of flight. A new left elevator was installed, and after 4 hours of flight, the cherry rivets commenced to loosen.

The right hand elevator is being replaced. In order to determine whether the failures may have been caused by turbulent air flow around the AN/APN-1 antennas, the AN/APN-1 antenna located on the under surface of the RH horizontal stabilizer will be rotated 90° (to a position parallel to the airplane's longitudinal axis) in order to reduce turbulence over the elevator. The AN/APN-1 antenna located on the under surface of the LH horizontal stabilizer will not be rotated.

Canopy. The canopy cracked during a routine flight.

Engine Cowl Diffuser. The upper right attachment brace of the rear support assembly broke off below the attachment lug, and two rivets failed on the bracket of the rear support assembly.

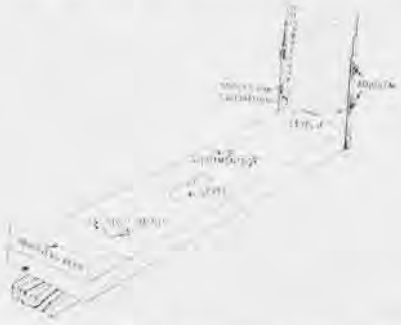
Suction Regulating Valve. Investigation of a failure of the turn and bank indicator revealed that the spline drive shaft of the engine driven vacuum pump had sheared. Bronze particles were found in the vacuum pump and throughout the vacuum system. The suction regulating valve for the turn and bank indicator was removed and dismantled, and the bronze valve stem guide was found to be badly worn. It is believed that bronze particles from the valve stem guide entered the vacuum pump and caused the drive shaft to fail. Failures of the turn and bank indicator and the engine-driven vacuum pump had been previously reported.

Brake Accumulator. The lip of the diaphragm in the brake accumulator failed. Under Investigation. The breaking of the exhaust clamp which broke after 167 hours is being investigated.

Device Is Help in Bombing

VMF-513, EL TORO—M/Sgt. Henry L. Berge has developed a device for determining the actual pullout altitude of a plane in a bombing run, a problem which has been bothersome because of the inaccuracy of normal altimeters and the plane's heavy G pullout condition.

In the past it required an extra plane



circling the target to monitor low pullouts, which at the best was not too satisfactory.

To get an accurate reading, a device was made using line of sight angular measurement. It was mounted in the observation tower some distance from the target. The device used a plastic plate marked for every 100' of altitude above the target.

The base of the device was in length proportional to the height of the calibration on the plastic, as the distance the device was from the target to the corresponding altitude over the target. Adjustment screws were put in to change the position of the plastic, also to allow for changes in tower distance from the "bull" of the target on different ranges. Two leveling bubbles also were installed.

Miami 'Oven' Bakes Props

FAIRWING 5, NORFOLK—In preparing for cold weather operations at Argentia, VP-23 ran into a problem of getting a 130° heat in Miami, Fla., to help install prop boots for de-icer equipment.

The props are supposed to be kept at that temperature for 24 hours. Since the prop shop at Miami is directly below the Air Reserve office spaces, the latter could hardly appreciate working over an "oven".

The problem was solved finally by doing the heating over week-ends. Several week-ends later all 36 PB4Y-2 propellers had been completed. Heat was obtained by using two Herman-Nelson heaters outside with the heat being piped in through the windows.

It Needn't Have Happened

Recently an operating activity experienced damage to an F4U-FG type aircraft, which was caused by faulty maintenance. It was the same old story; the airplane was damaged when a landing gear collapsed.

The plane had been grounded by an hydraulic leak. A mechanic investigated and found that an actuating cylinder was leaking. A new cylinder was installed in the aircraft, and the plane placed in commission status.

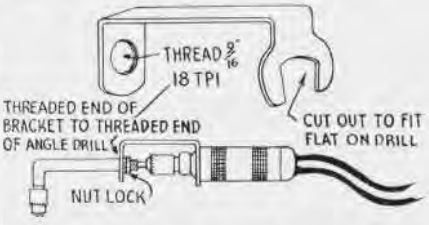
When the pilot attempted to taxi to take-off position, one landing gear collapsed. Investigation showed that the mechanic had installed the actuating cylinder backwards.

Technical Order 2-48 was issued by BUAER to correct just such a situation. Had the mechanic complied with the existing directive which requires that "whenever any component of the landing gear is changed, the plane will be jacked and the gear cycled," this accident would not have happened.

The sad part of the whole story is that disciplinary action had to be taken. Moral: Technical Orders are important.

Device Acts as 'Third Hand'

NAS ST. LOUIS—Faced with the need for a "third hand" in the use of the air drill with angle drill extension, Dale Naumer AM2 of the maintenance department devised a simple bracket which holds the extension drill rigid when in use. Previously one hand was used to hold the air drill, while the other held the extension to keep it from turning. Now the bracket, shown in the diagram, made of .09 steel sheet, does the trick.



HOLDING BRACKET FOR AIR DRILL AND ANGLE DRILL

AVIATION ORDNANCE

Rocket Motor Woes Continue

Misfires of rocket motors in service continues to be of great concern to the Bureau of Ordnance. Recent information received from a Naval Ammunition Depot, relative to the cause of twelve reported misfires of *2.25 Rocket Motors Mk 11 Mod 1* delivered to the depot from an outlying naval field, indicates extremely rough handling.

The depot stated in its report that exterior examination of the motors revealed several male connector plugs were missing and the condition of the bare wire ends indicated that sufficient force had been used in pulling action on the plugs to cause the wires to part.

Unofficial information obtained by the depot indicated that, during quick re-arming of planes, it was the practice to grab the rockets and jerk the male plugs out of the female plugs rather than remove them in the normal manner, as this saves re-arming time. Further, sometimes the plane crews would re-arm a plane with rockets which had misfired on a different plane, and the rockets would fire function normally.

The twelve misfired rocket motors were subjected to a circuit continuity test at the depot, and all passed the test satisfactorily except one which had a broken igniter bridge wire. The eleven satisfactory motors test-fired on the depot's rocket range, functioned normally.

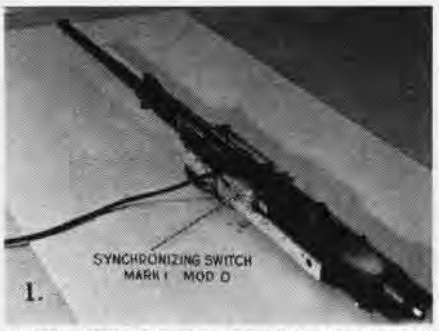
The depot further stated that in testing rocket motors at the depot, it is necessary to renew female plugs in the continuity circuit test panels because of the wear on internal parts after approximately seven hundred rocket motors have been tested. The depot expressed the opinion that wear on contact points of female plugs on planes would be somewhat greater than the corresponding female plugs on the depot continuity circuit test panel for a given number of rounds owing to rough treatment. Rough handling of rockets in re-arming planes will also contribute to broken igniter bridge wires.

The Bureau of Ordnance has recently promulgated Ordnance Handling Instructions to emphasize care in handling of aircraft rockets during arming and re-arming of aircraft.

Gun Synchronizing Switch

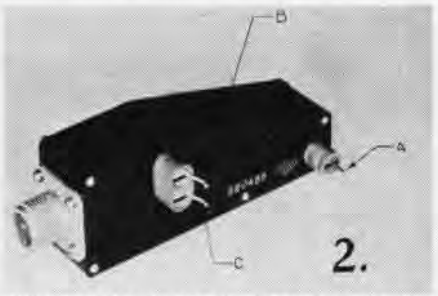
Electrically primed 20mm aircraft ammunition has provided an effective means of timing gun fire. Synchronizing gun fire in aircraft turrets reduces gun dispersion and reaction loads. As a result, gun mechanisms designed to fire electrically primed ammunition are fast replacing the percussion type.

Tests at the Naval Proving Ground, Dahlgren, have proved that multiple guns can be timed to fire in phase by use of the 20mm Synchronizing Switch, Mk 1 Mod 0. This synchronizing switch is now being used with 20mm Automatic Guns M24 in turrets of new production aircraft.



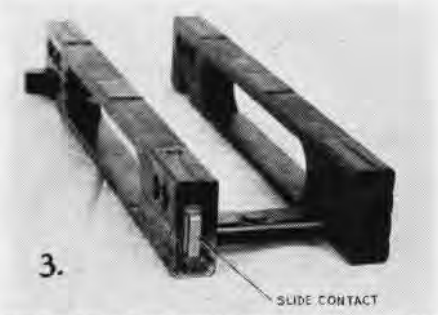
SWITCH MOUNTED ON LEFT SIDE OF RECEIVER

The Synchronizing Switch Mk 1 Mod 0 is a three-prong contact switch actuated by either the left or right hand gun breech-



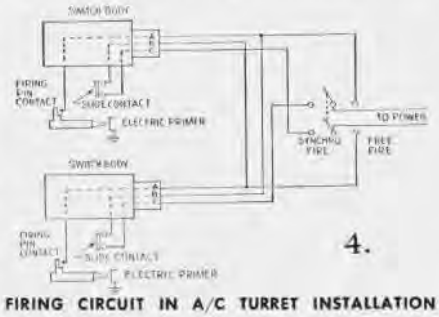
SWITCH IS ASSEMBLED FOR RIGHT SIDE OF GUN

block slide. The installation circuit is so arranged that the breechblock slide of one gun closes the firing circuit of the opposite



SYNCHRONIZED CONTACT SLIDE IS SHOWN HERE

gun. Ignition of the primers cannot occur until both breechblock assemblies are locked in battery. The switch is fastened to the forward end of the gun receiver body (Figure 1).



FIRING CIRCUIT IN A/C TURRET INSTALLATION

Figure 2 illustrates the switch assembled for mounting to the right side of the gun receiver. If required by the installation, the same switch components may be reassembled for mounting on the left side of the gun. The switch body (Figure 2) contains three spring wire contacts, *A*, *B*, and *C*. Contacts *A*, *B*, and *C* connect internally to a three-prong AN connector mounted on the forward end of the switch body. The AN connector is attached to the power source. Wires *B* and *C* protrude through a slot in the gun receiver and bear against an insulated metal strip assembled in the forward end of the breechblock slide.

Figure 3 illustrates the metal contact strip assembled to the slide. When wires *B* and *C* contact the metal strip in the breechblock slide, wire *A* of the opposite switch is energized. Wire *A* contacts the firing pin in the bolt body and completes the circuit to the cartridge primer. Thus, contacts *B* and *C* provide synchronization and contact *A* causes ignition.

Figure 4 illustrates the firing circuit used in aircraft turret installations. Leters *A*, *B*, and *C* in the circuit diagram correspond to contact wires *A*, *B*, and *C* in Figure 2. The slide contact corresponds to the slide contact assembled to the slide, Figure 3.

Rats Chaw Up Sound Proof

VMR-252, CHERRY POINT—Add problems of maintaining airplanes.

The engineering section of the squadron became aware of a rapid deterioration of the sound proofing of an R5C-1 plane. Further investigation showed that rats apparently had been eating the material. The plane had just returned from a 30-day tour of duty in North Africa and had not been flown locally since.

It was assumed therefore that the rats were of the African desert variety and had received a gratis airlift to Cherry Point at the pleasure of Maj. W. P. Dukes, the plane commander. The situation was remedied by extermination measures by CPhM H. B. Wright of the station malaria control unit.

Fire 'Plugs' Guard Engines

Installation of fire-detection systems in Navy multi-engine aircraft, including jet fighters, is progressing as a step in the Navy's safety program for planes.

Most of the planes have or are scheduled to get the Edison fire detection system after some other systems tried out tended to give false alarms. On some of the planes the thermocouple system will be installed around the engine and other systems retained elsewhere in the plane.

Planes already having these units are the P2V, *Mars*, F2H, FH-1, P4M, P5M, with installations slated for R5C, R5D, JD-1, AJ-1 and F9F. The *Panther* is the only single-engine aircraft in the list.

This new system has seven thermocouple detectors strung like a chain of Christmas tree lights around the cowl ring of each engine and four on each engine baffle. These sparkplug-like detectors are hooked up to relay panels and a light on the instrument panel to warn the pilot when danger arises.

Hot Wire Fires Gun Shell

BuAer received a report recently about a plane captain on a PB4Y-2 being injured when a .50 cal machine gun bullet detonated upon contact with a bare electrical wire while re-arming the gun.

The man was Louis B. Thomas, ADC, of VP-21. He was loading ammo into the for-

PHOTO SHOW HOW SHELL TOUCHED 'HOT' WIRE

ward crown turret can with his left hand when he felt a sensation in his hand. The hot lead in the emergency firing circuit had a bare wire showing. The base of one cartridge touched the wire and the primer was fired.

Although 28 volts in the hot lead fired this primer, it did not ignite the main propellant charge in the bullet. Inspection of other aircraft disclosed no other bare wires, but BuAer has had reports of similar accidents in the past.

Some 20 mm. ammunition in aircraft now are fired by electrical current, but .50 cal. cartridges are still percussion-detonated with a firing pin.

Grease Bolt Inspection Aid

NAS Niagara Falls—S/Sgt. J. S. McCoy and E. J. Bernard ADC have designed grease bolt thread protectors to facilitate the alignment of the tail wheel scissors assembly. Use of these grease bolt thread-protectors, while re-installing the tail wheel assembly, saves two man hours per plane.

One tapered thread protector has an inside diameter and thread size of 7/16" by 18 and an overall length of 3-3/16". A second thread protector has an inside diameter and a thread of 5/8 by 20 and an overall length of 4". Both thread protectors may be made of cold rolled steel of any other suitable material.

The station will furnish photographs of the protectors on request.

New Seal Installing Tool

NARTU Seattle—Through the combined efforts of A. C. Hayes ADC and T. G. Edmundson AD2, a special tool was designed that assures perfect installation of new seals in FG-1D wing flaps selector valve part #PF-3500-10. Previously the hydraulic shop had had difficulty installing the seals and a considerable number were being cut before an installation could be made.

The tool consists of a 2" "C" clamp with two bronze plugs attached. The plugs fit snugly in the selector hole and are machined to match the inner surface of the outer piston, thereby furnishing a smooth wall which prevents the cutting of the seals as they are slid past the selector hole.

SUPPLY NEWS
FROM ASO AND SUPPLY DIVISION BUAER

Airing Parachutes in Storage

A recent BuAer letter clarifies the policy pertaining to the periodic airing and drying of parachutes in storage. An excerpt from the letter, which refers to Parachute Manual NavAer 13-5-501 dated 1 September 1947, follows:

"Paragraph 17 provides that parachutes packed in accordance with Specification AN-P-75 may be stored in these containers until issued for services, which means no airing or drying while so packed. However, parachutes in storage that are not packed in original containers or repacked in accordance with Spec. AN-P-75 are to be aired and dried in accordance with Paragraph 19 of NavAer 13-5-501."

Salvaging Jet Engine Parts

At the annual joint Overhaul and Repair—Aviation Supply Conference, the conservation of critical and strategic materials was emphasized. It was agreed that certain spare parts in the "hot" section of jet engines should be retained. In the critical category are jet turbine parts: rotors, blades, discs, housings and nozzle diaphragms.

Activities should exercise every effort to insure the salvage of these items. The material should be collected and forwarded to the Supply & Fiscal Officer at the nearest major supply point, who will hold the salvaged items pending further instruction from BuAer.

Catalog Change Bulletin

The first edition of the ASO Catalog Quarterly Change Bulletin has recently been distributed. This publication now includes catalog information on Aviation Standard materials, Classes 5-77, but eventually will include information on the complete range of aviation material.

The Bulletin has a cumulative feature; this is, information appearing in the first edition will be repeated in the second edition unless the basic catalog section has been revised. The second edition of the Change Bulletin to be published this month will include cataloging information on Tools, Classes 40-41-66 in addition to information or Classes 5-77.

Spark Plug Preservation

O&R Department, MCAS Cherry Point, informed ASO that approximately 70% of the RB19R-2 and AC181 spark plugs received for overhaul are corroded to the extent that they cannot be overhauled as directed by Technical Order #10-49. Further investigation reveals that approximately 10% of all type spark plugs received under the Class 265 Program cannot be overhauled because of corrosion.

ASO Circular Letter #256, Revision 1, dated 20 December 1949, specifically outlines the necessity for the proper preservation, packaging and packing of repairable materials being shipped to contractor's plants, and Navy O&R Facilities for repair, rework, check, test or relubrication. All cognizant personnel should study the contents of ASO C/L 256.

Photographic Supplies Short

Funds for the procurement of tools and photo/photolithographic material continue to be very limited, and the result is a short supply. All personnel requisitioning such material should make sure that their requirements are fully justified.

Note Change ASO Address

To conform with city directory regulations, the address of the Aviation Supply Office, Naval Aviation Supply Depot, General Stores Supply Office, Navy Regional Accounts Office, and Assistant General Inspector Supply Corps (Air) has been changed from Oxford Avenue and Martins Mill Road, Philadelphia, to 700 Robbins Avenue, Philadelphia (11), Pa. This is a "paper" change only; no physical move was made. Use the new address for all correspondence.

Reprint of ASO Letters

The annual cumulative edition of ASO Circular Letters now in effect is being prepared. The publication will be distributed to field activities in the near future.

• NAS Atlanta—This station, jointly with Warner Brothers Motion Picture Distributing Company and the *Atlanta Constitution*, sponsored a 200-word essay contest for boys between 12 and 18 in the area on the subject "Why the Naval Air Reserve Peace-Time Task Force Is Sound Peace Insurance."

LETTERS

SIRS:

My interest in aviation prompted me years ago to begin logging the feats of outstanding pilots and I referred to my files after reading your October and December references to a Curtiss *Hawk* flying upside down over the Washington monument.

At a Pittsburgh airshow before the war, Mr. Al Williams, former Navy speed and aerobatic king, gave demonstrations in his *Gulfhawk* of the technique of his dive-bombing invention and inverted precision flying. When I met him that evening, he gave me a picture of his N-9 seaplane, spiraling upside down over Pensacola. He said it was taken in 1919, which shows that he started inverted flying research pretty early.

I checked Bureau files and found "Technical Note 192, Inverted Flight, November 15, 1928, by Lt. Alford J. Williams, USN," in which Mr. Williams describes how he used a Curtiss *Hawk* to take the mystery out of inverted flying.

This note also was published in Aero Digest for September, October and November 1928. The report describes the inverted turn, inverted tail spin, inverted loop, outside loop, vertical figure S and inverted snap barrel roll.

This is a very complete technical report on inverted flight in that it records the accelerations and normal and inverted flight G's for every conceivable maneuver. In 1943 I also found a copy of this report in an RAF station to which I was attached. For this and other test work, Lt. Williams received the DFC in 1929.

One of my clippings, dated May 14, 1930, *Washington Post*, AP states, "Lt. Alford J. Williams, noted naval aviator, has performed the lone remaining feat not previously accomplished in aviation, called the "inverted falling leaf,"

" . . . he used a Curtiss *Hawk*, a single-seat biplane with special gas and oil equipment to permit prolonged inverted flight.

"The maneuver brought to conclusion a series of inverted flight tests in which the aviator determined for the Navy the proper handling of controls to avoid spins and stem a mounting loss of life."

JOHN R. TURNER

NORFOLK, VA.

SIRS:

I would like to suggest that NAVAL AVIATION NEWS establish a department within its covers to print information of a technical information nature concerning present day aircraft in naval aviation. By technical information I mean the hows and whys of jets, helicopters, turbojets, and new hydraulic and electric control mechanisms etc.

This is not my opinion alone, it is actually the opinion of many naval aviators and officers who have served with naval aviation units, including Marine and Coast Guard, who are not on active duty in the Organized Reserve. They would like very much to keep posted on the technical side.

RAYMOND SHAHEEN
LEGAL OFFICER
NAVAL AVIATION OF AMERICA
CHICAGO, 22, ILL.

¶ NANews tried out that idea several years back but when it began publishing its unclassified edition for Reserves it ran into trouble because most of the worthwhile items were restricted. However, we present frequent articles of this nature—see "High Altitude Starting of Jet Engines" in this issue. With our limited number of pages, we haven't been able to go too deeply into the engineering details of new developments.

SIRS:

It was with a mixture of pride and interest that I read the article in the January 1950 NAVAL AVIATION NEWS about UTILITY SQUADRON ONE. With pride because VF-1 was my first aviation duty, and too, I was the only enlisted man in the squadron to receive the Navy Cross for action on December 7, 1941. With interest, because of the five men pictured as having a total of 52 years with VJ-1, I know and remember four as friends and shipmates.

In closing, I wish to express my thanks for an excellent, well-written article. In my estimation, it deserves the traditional "Well done!"

HARRY R. MEAD, ALC, USN

VP-26

***A radar**-equipped air-to-air guided missile, the Ryan Firebird, is shown above attached to the wing of an F-82 Mustang. The missile uses its radar to home on an enemy plane, even though the latter is invisible in the clouds. A booster section gives initial velocity, and flight rockets supply rest of the push.*

Grampaw *Pettibone says: "Now I've seen everything! An SNJ with a float!" The clipped 'Jay' was stored in the motor launch while the CVB Midway was en route to the Mediterranean for five months tour of duty.*

CONTENTS

Aeromedical Quest 1
High Altitude Flying 8
Slashes Hit Air Shows 10
New J-48 Jet Engine 11
Pilot Ejection Seats 13
Counter-Rotating Props 14
Patrol Bombing 104 16
Air Force Bombers 18
Marines Win Awards 24
NANews Visits Akron 27
Jet Hotfoot 31
First Raft Rider 32

● RECOGNITION QUIZ

Top—Supermarine *Attacker* E.10/44 fighter is easily recognized by thumb-like tail, fat barrel fuselage and cheek airscoops. A swept-back wing version called the Swift E.41/46 is also flying. A light plane despite appearance, weighs around 12,000 lbs. One Nene II engine gives 5,000 lbs. thrust.

Lower—Westland *Wyvern II* fighter. First production model fighter to use turboprop engine. A Clyde I compound axial and centrifugal flow turboprop engine puts the Wyvern in the 400-mph class. Weighs 16,000 pounds. No American planes flying today have turboprop engine, although Navy has the Allison XT-40 engine to go in the XP5Y-1.

● THE COVER

F2H-1's line up on the deck of the CVB *Franklin D. Roosevelt* for take-off during the giant naval demonstration put on last fall for Secretary of Defense Johnson and other high defense leaders.

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'TOOLIE' PUTS THE FINGER ON DILBERTS

SOMETIMES laughter will teach more than a blacksnake whip. VU-10, at Guantanamo, put Lt. (jg) Matherson to work lampooning erring pilots. The top cartoons depicts the TD2C pilot who taxied right into the hangar—almost. Number 2 pictures the helicopter pilot who collected cactus foliage on his rotors. The pilot admitted he had been "pretty close" to the tree. Number 3 pokes fun at the JD pilot who flew so fast he couldn't stream a gunnery sleeve. There were four in the air, two on the tow when he finally slowed down. Next is the expert who taxied his PBY-5A into a JD. Number 5 satirizes the drone control pilot who forgot to watch his altimeter and collected cactus in his flaps. Last is the pilot who went out to drop sonobuoys and forgot to take along a receiver. Using sonobuoys for intercom is something new. The cartoons were posted on the bulletin board and pilots collected ribs from fellow fliers until a new "goat" turned up to share their jibes and heckling. This is a form of "boner badge" which gets good results.

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